

A SURVEY OF NUTRITIONAL SCREENING
PRACTICES IN HOSPITALS OF VIRGINIA

by


EMILY S. FURTEK

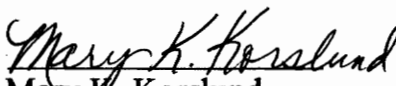
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(ABSTRACT)

The purpose of this study was to describe nutritional screening practices in hospital settings in Virginia. A questionnaire was mailed to each of the chief clinical dietitians employed at 123 Virginia hospitals listed in the 1994 American Hospital Guide (22). Ninety-one (74%) responses were received.

Twenty-five (27.5 %) of the hospitals included in the survey were considered large hospitals with more than 300 licensed beds and 66 (72.5 %) were small hospitals with 300 or fewer licensed beds. Re-screening of patients occurred in 40 (60.6 %) of the small hospitals while 8 (32 %) of the large hospitals had re-screening policies. Computers were used for nutritional screening in 17 (68 %) of the large hospitals and 13 (19.7 %) of the small hospitals. Dietetic technicians participated in screening in 10 (40 %) of the large hospitals and in 11 (16.9 %) of the small hospitals. Dietetic students participated in screening in 8

(32 %) of the large hospitals and they participated in 3 (4.5 %) of the small hospitals. Hemoglobin was used in 6 (24 %) of the large hospitals to determine a patient's nutritional risk. It was used in 34 (51.5 %) of the small hospitals. Hematocrit was used in 36 (54.5 %) of the small hospitals and in 5 (20 %) of the large hospitals. All of these associations between large and small hospitals were significantly different ($p \leq .05$) as determined by Chi square analysis.

Since there were no other significant associations between large and small hospitals, the remainder of the results were treated as one group of hospitals. Seventy-five (82.4 %) of the hospitals represented in the survey had written screening policies and a standard form was used in 59 (64.8 %) of them. Fifteen (16.5 %) of the hospitals surveyed had written screening policies for specialty units; 8 (8.8 %) also had specific forms.

The three most common items included in the routine nutritional screening were weight, height, and lab results. Weight and height also were the items most often missing or not available when a routine screening was performed. Albumin was used as an abnormal finding to determine nutritional risk in 79 (86.8 %) of the hospitals; while weight loss was used in 82 (90.1 %) of the hospitals and weight for height was used in 69 (75.8 %) hospitals.

Dedication

I dedicate this thesis to my mother, Bertha Hinckley Gibbs. She taught me never to give up and most important, to complete any project I started. I still remember her struggling to complete her thesis (case study) for Master of Science in Special Education. She gave me the inspiration to complete this thesis.

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INTRODUCTION

In the past 20 years, the subject of hospital malnutrition has received much attention. In 1974, Butterworth (1) studied the nutritional care of hospitalized patients and reported on hospital malnutrition. He identified fourteen hospital practices that were detrimental to the nutritional health of patients. Butterworth's experiences with hospital malnutrition led others (2-4) to take a closer look at the nutritional status of hospitalized patients.

In the 1980s and 1990s, the issue of cost effectiveness of health care brought further attention to the problem of hospital malnutrition. The economic effect of hospital malnutrition on the health care system was summarized in a report by the Nutritional Care Management Institute (5):

Nutritional risk's total economic impact includes 9% higher costs per day, as well as more days per patient.

Between 1980 and 1985, Reilly and associates (6) reviewed 771 patients' charts from two hospitals, and found that those medical and surgical patients with the likelihood of malnutrition had greater costs and charges.

Nutritional screening in hospitals is an important step in the prevention of hospital malnutrition. It is a process used to identify patients at high risk for malnutrition and to direct the attention of nutritional services to those in most need of nutritional care (7-9). Nutritional screening in the hospital setting varies from hospital to hospital. For example, in some hospitals screening consists of a timely in-depth mini-assessment; whereas, in other hospitals it consists simply of a quick recording of a patient's height and weight. Each institution uses its own screening

policies and screening forms. The personnel participating in nutritional screening and their roles varies also.

The American Dietetic Association has developed definitions to serve as guidelines for professionals (10). The definition for nutritional screening, developed by the Council on Practice Quality Management Committee in 1993 (10), was intended to be appropriate for use in all settings and for all ages. The Committee suggested that the following personnel be involved in the nutritional screening process: dietitian, dietitian technician, physician, nurse, dietary manager, or other professional health care workers. The following definition and guidelines were developed:

The screening process has the following characteristics:

- may be completed in any setting;
- facilitates completion of early intervention goals;
- includes the collection of relevant data on risk factors and the interpretation of data for intervention and treatment;
- determines the need for nutritional assessment, and
- is cost effective.

In 1995 the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) (11) instituted new standards for nutritional assessment that appeared in the Accreditation Manual for Hospitals. The standards defined the initial screening for nutritional care as a process to determine the need for care, the type of care, and the need for further assessment. The intent in the regulation is stated as follows:

initial screening and/or assessment identifies patients who are at moderate or high nutritional risk so a qualified dietitian can perform a nutritional assessment on them (10).

As an example of implementation, the standards state that when screening criteria

identify those at high risk, the further assessment should include:

- adequacy of nutrient intakes
- weight and height history
- review of related lab tests
- physical examination showing any nutrient deficiency or excesses
- medications
- conditions related to ingestion, digestion, absorption, and utilization of nutrients
- food tolerances and allergies
- cultural, ethnic, religious, and personal preferences
- diet prescription.

There is a need to study the nutritional screening process by itself, apart from nutritional assessment, since it is a discrete, initial step in the nutritional care of hospitalized patients . The purpose of this study was to describe nutritional screening practices in the hospital setting in Virginia. A mailed questionnaire was used to collect data which aided in answering the following research questions:

1. What standard screening forms and policies are used for nutritional screening?
2. Who are the personnel involved in nutritional screening and what are their roles?

3. Are computers used in the nutritional screening process?
4. What specialized nutritional screening practices and procedures for specialty areas are used in the hospitals?
5. What are the most common risk factors that are used for data collection in nutritional screening?
6. How do the nutritional screening practices in hospitals in Virginia compare to the 1995 Standards from JCAHO?

REVIEW OF LITERATURE

Hospital Malnutrition and Its Indicators

Butterworth (1) identified common practices in hospitals that had an unfavorable effect on the patients' nutritional health. These practices included the following areas: staffing, patient care, patient feeding, and nutritional support. Frequent rotation of staff and lack of communication between dietitians and physicians were notable staffing problems. Unfavorable patient care practices included failure to record height and weight, limited use of lab tests to assess nutritional status, and failure to recognize the role of nutrition in the treatment of and recovery from illness, infection, or injury. Use of intravenous fluids of glucose or saline for extended periods of time, delayed or missed meals, and failure to observe food intake were detrimental feeding practices. The failure to use nutritional support until the patient was severely depleted and, often, in an irreversible state also contributed to poor nutritional health in many hospitalized patients.

Prevost and Butterworth (2) studied the medical records of 80 medical and surgical patients hospitalized for two weeks or longer at the University of Alabama Hospital, Birmingham (UAB). They found that 45 (56 %) had no height recorded in the medical record and 18 (23 %) had no weight recorded. There were no weights recorded during the first seven days of hospitalization in 21 (26 %) of the medical records, and 34 (43 %) of the records had no regular recording of weights. The medical record on review revealed that anemia was present in 30 (37 %) of the patients on admission, and that 13 (16 %) developed anemia during the hospital stay. Hypoalbuminemia was noted in a total of 30 (37 %) of the

records reviewed. Twenty-two (28 %) of the patients had hypoalbuminemia on admission, and 7 (9 %) developed it during the hospital stay.

In another study at UAB in 1976 by Weinsner and associates (3), data were collected from 134 medical patients' charts and follow-up analysis was done after two weeks for patients still hospitalized. The data collected included serum folate, serum vitamin C, total lymphocyte count, serum albumin, hematocrit, weight, height, triceps skinfold, and arm muscle circumference. The likelihood of malnutrition was calculated by a scoring system using the data collected as indicators. The indicators were divided into three categories based on degree of malnutrition, and the categories were assigned the following point values : 25 points for major malnutrition, 10 points for intermediate malnutrition, and five points for minor malnutrition. Each indicator also was given a different weight in the determination of the likelihood of malnutrition (LOM). Sixty-four (48 %) of medical charts reviewed on admission to the hospital were of patients with high likelihood of malnutrition (LOM) scores. Ninety-two (69 %) of those patients hospitalized two weeks or longer had high LOM scores. Six of the eight indicators got worse during the hospitalization. These included folate, triceps skinfold, weight, arm muscle circumference, lymphocytes, and hematocrit. Patients that had high LOM scores were compared to those with low LOM scores for length of stay and mortality rates. Patients with high LOM scores had lengths of stay of 20 days compared to the 12 days for those with low LOM scores. The two indicators most highly associated with extended length of stay were substandard serum albumin and hematocrit. The mortality rate for those with high LOM was 17 (13 %); for those with low scores, 5 (4 %). The triceps skinfolds and height and weight were indicators highly associated with increased mortality rates.

Coates et al (4) repeated the 1976 study by Weinsler et al (3). The study was again conducted at UAB with data collected for the same indicators. Likelihood of malnutrition scores were studied in 228 medical patients within 48 hours of admission and were re-evaluated after two weeks, with follow-up weekly until discharge. The mean serum albumin levels were lower, and the mean vitamin C and folate levels were higher than in the previous study. Lower albumin, hematocrit, and lymphocyte count levels were found for patient who had a length of stay of two weeks or longer. In 1988 high LOM scores were associated with both increased length of stay and increased mortality rates. No indicator was found to be associated with mortality rates in the 1988 study. Eighty-seven (38 %) of the records reviewed had high LOM scores on admission. One-hundred and four (46 %) were found with high LOM scores after two or more weeks of hospitalization. Upon comparing the results of the 1988 study with the results from the 1976 study, a decrease of LOM scores from admission (38 % in 1988 and 48 % in 1976) and a decrease for the two-week re-evaluation (46 % in 1988 and 62 % in 1976) were noted. In both 1976 and 1988, the LOM scores increased during the hospital stay (in 1976 from 48 % to 62 % and in 1988 from 38 % to 46 %). Thus, this research shows the changes in hospital malnutrition during the 12-year period (1976 to 1988) in one hospital (University Alabama, Birmingham).

In a study by Reilly et al (6), the economic impact of hospital malnutrition was examined. Charts were reviewed at two participating hospitals. One of the hospitals was a 500-bed university affiliated hospital and the other was a 200-bed private church affiliated hospital. Four hundred charts of medical and surgical patients from each hospital were reviewed. Seven hundred and seventy-one charts met the criteria for participation in the study. The nutrition status was

assessed by the following factors: serum albumin, total lymphocytes, weight and height, history of weight loss, and visual assessment. The likelihood of malnutrition was determined from the nutrition assessment. The incidence of LOM was 54 % overall for the total group. A physician reviewed an itemized bill of each study patient and determined a cause category for each item. The categories included charges for all other and usual services, charges for predefined complications, charges for nutritional support, and charges for a complication of nutritional support. Patients with LOM had significantly greater costs and charges per day than those without LOM. Also, the patients with LOM were 2.1 times as likely to have minor complications. For major complications, those with LOM had significantly greater total costs, total charges, and greater cost and charges per day than those without LOM. For patients with LOM the death rate was 3.8 times higher. This study reveals that malnutrition does have an economic impact that is reflected in hospital costs.

By the American Dietetic Association's definition (10), hospital nutritional screening identifies patients that are malnourished or at nutritional risk. There are many tests used to accomplish this task. Klidjian and associates (12) studied 120 surgical patients. They were looking for an indicator of malnutrition that was best in predicting serious complications after surgery. The indicators studied were weight for height, weight loss, arm muscle circumference, forearm muscle circumference, grip strength, and albumin. The grip strength was found to be the best indicator when it was used as a screening test, predicting development of complications in 43 of 48 patients.

Seltzer and associates (13) developed a tool for hospital use to detect those patients at risk for increased complications and death. They collected data

on 500 admissions to St. Barnabas Medical Center in New Jersey. The data collected were diagnosis, complications, incidence of death, and serum albumin and serum total lymphocyte count on admission. Of the 500 admissions, 38 (7.6%) had abnormal albumin levels and 45 (30.2 %) had abnormal total lymphocyte counts. A four-fold increase in complications and a six-fold increase in deaths were found in patients with abnormal serum albumin levels. The complications were increased 1.8 times in those with abnormal total lymphocyte counts. This was not a significant difference. The deaths were increased four-fold in those with abnormal lymphocyte count. When the two values were combined, there was a four-fold increase in complications and a twenty-fold increase in deaths. The serum albumin and total lymphocyte count are values that can be easily obtained in routine admission laboratory work, making them useful tools in screening.

Screening Standards

In 1990 the Nutrition Screening Initiative (14) was formed. It was a combined effort of the American Academy of Family Physicians, the American Dietetic Association, and the National Council on Aging. In December 1991 the Nutritional Health Checklist and Level I and Level II nutritional screens were developed. The Level II screen is to be used in a medical setting by a health care professional. Laboratory work is included. The Level II nutritional screen has 8 parts: anthropometric, laboratory data, drug use, clinical observation, eating habits, living environment, functional status, and mental/cognitive status. The anthropometric part included determination of body mass index using height and weight data. Mid-arm circumference, tricep skinfolds, and mid arm muscle

circumference are also included in the anthropometric part. Serum cholesterol and albumin are included in the laboratory data. Checklists are used to collect information on the number of drugs used, (prescription, over-the-counter, and vitamin and mineral supplements) physical signs of malnutrition, daily eating habits, household income and environment, performance of activities of daily living, mental and reasoning status. This screening tool can be adapted to any medical setting, and it serves as a standard nutritional screen for older Americans.

The JCAHO standards (11) for patient care include nutritional screening as one of the processes of nutritional care. The approach to nutritional care is interdisciplinary with integrated patient care. Aspects to be included in screening are patients' physical, psychological, social, nutritional, functional and educational needs.

Screening Practices

There have been several research studies in the past 15 years on nutritional screening. In the nutritional screening studies reviewed, the most common missing data were information pertaining to weight. This was consistent with undesirable hospital practices revealed by Butterworth (1). The 1983-1984 study by Kamath et al (15) of 3047 patients from 33 hospitals in Illinois found weight missing in 1124 (36.9 %) of the records within 48 hours of admission. The height and weight for 2066 patients (67 %) were recorded, but only 543 (17.8 %) patients were measured. For most of the patients in this study, the weights and heights in the records were self-reported. The data for this study were collected by 33 clinical nutrition administrators of hospitals. Serum albumin, hemoglobin, and total lymphocyte count levels were available for only 1,240 (40.7 %) of the

patients. One-thousand seven-hundred and sixty-seven (58) of those patients having the three lab values had one or more of these values at levels indicating nutritional risk.

In a 1984 study of 1141 surgical patients, Thompson et al (16) found at least two of the three indicators (total lymphocyte count, serum albumin and percent of ideal body weight) available in 876 (76 %) of the medical records within 48 hours of admission. Of these three indicators serum albumin was the value to be missing most frequently. Six-hundred and twenty-seven (55 %) of the patients had at least one abnormal value when all three indicators were present. Two or more abnormal values were present in 479 (42 %) of the group when all three indicators were present.. Hedberg et al (17) found incomplete data on height or weight in 96 (42.5 %) of 225 patients screened in a pilot study conducted for a three-month period using a simple screening tool. The screening tool included data on the diagnosis, height, weight, serum albumin, and nutrition orders for patients at a 931 bed acute care general hospital.

A follow-up study was conducted using the same screening procedures as the pilot study but with additional information collected from the patients on appetite and usual body weight, total lymphocyte count, and medical information on nutritional related problems. Three-hundred and forty-two (70 %) of 488 patients in the study had unavailable weights or heights. In the follow-up study 185 (37.9 %) of the 488 patients screened were at severe risk for malnutrition; whereas in the pilot study, 65 (28.7 %) were at severe risk for malnutrition. The increase in patients at risk may be due to the additional screening of all those on tube feeding, total parental nutrition, and those identified by nursing with pressure sores.

Sayarath (18) found that data about unintentional weight loss was missing for 34 patients participating in a study conducted at a community hospital. The patients had risk factors of low percent ideal body weight, unintentional weight loss, albumin, nothing by mouth or clear liquids for three or more days, and inadequate food intake for three days. Using these risk factors, malnutrition was found in 10 (29.4 %) of the 34 patients.

There are various indicators and combinations of indicators that are used to detect the risk of malnutrition: total lymphocyte count, serum albumin levels, weight, percent weight loss, and percent ideal body weight. Elmore et al (19) found that the combination of total lymphocyte count, percent weight loss, and serum albumin were the best indicators. These researchers did a two-part study in 1990. The first part involved 100 medical and surgical patients. Each of the participating patients was evaluated with a full nutritional assessment and nutritional screening. The results from the assessment and screening were compared. From the full assessment results, 40 % of the patients were classified as high risk of malnutrition and 60 % were identified as low risk. Results of nutritional screening indicates 16 % were at high risk and 56 % were at low risk, and that 4 % of the screens yielded a false-positive, and 24 % yielded false-negative results. Serum albumin levels, total lymphocyte counts, and percentage of weight loss were the best combination of indicators to determine risk for malnutrition.

The second part of the study (19) involved 151 medical and surgical patients at a different community hospital. Nutritional screening and full assessment were performed on each patient using the same procedures as in the first part of the study. Serum albumin level, total lymphocyte count, and a

prealbumin level were determined as soon after admission as possible. These three screening parameters were compared with the full assessment. Nutritional screening identified 88 (58 %) of the patients as being at low risk and 33 (22 %) as being at high risk for malnutrition. The full assessment of these patients revealed that 104 (69 %) were at low risk and 47 (31 %) were at high risk. There was a 30 (20 %) overall misclassification rate in the second part of the study. No significant improvement in sensitivity and specificity that would justify the additional cost was found.

In a study at Chabert Medical Center, a 201 bed acute care teaching hospital, Mears (9) found prealbumin to be a sensitive and cost-effective indicator of the risk of malnutrition. This study also was carried out in two parts. During the first part of the study, 95 patients from all services of the hospital participated. Serum albumin and prealbumin levels were measured, and the risk of malnutrition was determined. Based on serum albumin levels, each patient was assigned a group. The group was classified either as severe, moderate, or no risk for protein-calorie malnutrition. Then they were classified in groups again based on their prealbumin levels. By using prealbumin levels, 54 (56 %) of those classified in the group with no risk for malnutrition again were assigned to the no-risk group using serum albumin levels. Furthermore, 42 (44 %) of the patients assigned to the no-risk for malnutrition group using serum albumin levels were at risk for malnutrition based on the prealbumin level.

For the second part of this study, 65 patients with various diagnoses had serum albumin and prealbumin level results used to determine whether their risk for protein-calorie malnutrition was severe, moderate, or nonexistent. The patients then were assigned randomly to the following groups: experimental, control 1,

control 2, or a comparison group for those with renal failure. The experimental group received nutrition intervention immediately. This intervention included adjustment of meal patterns, between meal snacks of milkshakes and puddings, medical nutritional supplements as recommended by the clinical dietitians, and counseling by the dietitians on the importance of good nutrition. The prealbumin levels were measured every two days for all the groups except for the comparison group which had prealbumin levels measured every four days. Nutrition intervention was started for the control group when prealbumin levels were markedly decreased. The kind of nutrition intervention was selected by the dietitian. The control 2 group received nutrition intervention only if it was ordered by the physician. Data were collected on the changes in serum albumin and prealbumin levels and the length of stay of the study participants. Those participating in the experimental group had a rapid rise in the prealbumin level while the serum albumin level remained unchanged. Patients in the control group 1 had a decrease in the prealbumin level until the nutrition intervention occurred. After the nutrition intervention was started, the prealbumin level rose at the same time and rate as the level of the experimental group. Most of the patients in the control group 2 had a continuous decline in the prealbumin level and only a slight change in their albumin level. The patients in the experimental group had a decreased length of stay compared with those in control group 1 and control group 2. There was no significant difference in the length of stay between control group 1 and control group 2.

Both Schiller (20) and Foltz, et al (21) studied nutritional screening practices. One questionnaire (20) addressing current clinical practices was directed toward chief clinical dietitians. Two hundred chief dietitians agreed to participate

in the survey, and responses were received from 177 (88.5 %) of them. The size of the hospital was considered in analyzing the results. Large hospitals were considered to be those with more than 300 beds; small hospitals, those with 300 or fewer beds. The large hospital group contained 108 hospitals; while 69 were in the small hospital group. All new admissions to the hospital were screened in 47 (43.9%) of the large hospitals and in 32 (46.4 %) of the small hospitals.

Almost 10 years later, there was a survey of 988 dietitians (21) from the nutrition support group, a dietetic practice group of the American Dietetic Association. These dietitians were from several different settings; community, pediatric, veterans administration, government, research, academic, and non-profit hospitals and long term care facilities. Five-hundred and sixty-three (57 %) of the participants were from community-private hospitals. Six-hundred and four (61.2 %) of the hospitals performed nutritional screens on all newly admitted patients. Eight-hundred and ninety-one (90.2 %) of the institutions had screening policies. Dietitians participated in screening in 662 (67 %) of the hospitals. In 454 (46 %) of the hospitals dietitians alone were involved in screening and in 194 (19.6 %) of them they had assistance from dietetic technician or finally diet aide in 31 (3.1%) of the hospitals. Dietetic technicians participated alone in screening in 248 (25.1 %) of the hospitals. Diet aides had the main responsibility for screening in 59 (6 %) of the hospitals. This study was more specific than the earlier one and looked at existing screening practices in depth. The most common items used in routine screening were weight, height, diagnosis, weight loss, and serum albumin.

Summary

Hospital malnutrition is characterized by common practices that occur during hospitalization that have an unfavorable effect on the patients' nutritional

health. These practices contribute to lower serum albumin, hematocrit, and total lymphocyte count levels. Hospital malnutrition is associated with increased length of stay, increased mortality rates, and greater hospital costs.

Hospital nutritional screening identifies the patients that are malnourished or those at risk for malnutrition. There are many tests and indicators that can be used to detect malnutrition. Some of the best indicators and tests included grip strength, serum albumin, and total lymphocyte count.

At the present there are only a few standards for hospital nutritional screening criteria. The Nutrition Screening Initiative developed Level I and Level II nutritional screening for older Americans. Additionally, hospital standards for nutritional care developed by JACHO include guidelines for screening.

Studies of hospital nutritional screening have included experimental research studies, and questionnaire survey studies. The findings of these studies have contributed to the growth of nutritional screening in the field. Total lymphocyte count, serum albumin level, weight, percent weight loss, and percent of ideal body weight are the most common indicators of malnutrition used in the experimental screening research studies. Incomplete nutritional screening information on height, weight, and unintentional weight loss are found in these research studies. Questionnaire surveys have provided information on hospital screening practices. The researchers collected information from chief clinical dietitians of both large and small hospitals and dietitians belonging to the nutrition support practice group of the American Dietetic Association.

This questionnaire survey has collected information provided by the chief clinical dietitians at hospitals in the state of Virginia. The information includes nutritional screening policies and current nutritional screening practices.

METHODS

Procedures

A mailed questionnaire was used to collect descriptive information on nutritional screening practices in hospitals in Virginia. The study protocol received approval at Virginia Tech by the Institutional Review Board for research involving human subjects. The questionnaire (Appendix A) was pre-tested in a pilot study in all 17 hospitals in the District of Columbia. Additionally, five nutrition professionals selected from a review of recent research on nutritional screening were asked to evaluate the survey instrument.

Cover letters (Appendices B and C) accompanied each questionnaire explaining the purpose of the study. Each chief clinical dietitian participating in the pilot study was asked to submit sample standard and specialty screening forms and written screening policies both for routine screening and for screening of specialty units from the hospitals where they were employed. A follow-up reminder postcard was mailed to those not responding to the questionnaire after two weeks and after five weeks from the mailout date. Six weeks was allocated to pre-testing the questionnaire in the pilot study. After the six-week period, the instrument was revised in accordance with suggestions of those participating in the pilot study. The final questionnaire (Appendix D) was sent to all the chief clinical dietitians employed at the 123 Virginia hospitals listed in the 1994 American Hospital Guide (22). A cover letter (Appendix E) explaining the purpose of the study accompanied the questionnaire. Each questionnaire was coded with a number for follow-up purposes. After two weeks, a follow-up reminder postcard (Appendix F) was sent to those not yet responding. A second reminder (Appendix G) was sent after five weeks from the mailout date.

Analysis of Data

Questionnaire responses were coded with variables identified as either categorical or continuous. The continuous variables were responses to questions 2,4, and 16. Responses to all other questions comprised the categorical data. A data base was created from the completed questionnaires . Text portions of the questions were tallied by hand. Descriptive statistical analysis was done on all continuous responses using Number Cruncher Statistical System (NCSS) (23).

Chi square analysis using NCSS was used to compare the nutritional screening practices and determine if an association existed between hospital size and the nutritional screening practices. Large hospitals were considered to be those with more than 300 licensed beds, and small hospitals were considered to be those with 300 or fewer licensed beds. This determination of hospital size was based on research by Schiller (20). A .05 level of significance was selected.

RESULTS

Survey Participants

Surveys were sent to the chief clinical dietitians of 123 hospitals in Virginia accredited by the American Hospital Association. Ninety-one responses (74%) were received. Questions one and three of the survey (appendix D) provided information about the hospitals where the survey participants were employed. This information was used for the profile of the participating hospitals. Fifty-six (60.2%) of the hospitals participating in the survey had between 0 and 150 licensed beds and 21 (23.1%) of the hospitals had between 151 and 300 beds. There were 8 (8.8%) of the participating hospitals with between 301 and 500 beds, and only 4 (4.4%) of the hospitals had between 501 and 650 beds. Finally, 1 (1.1%) of hospitals participating in the survey had 651 or more beds.

Information on the types of specialty units in the participating hospitals also was collected. The most commonly found specialty units were intensive care (n=72, 78%), cardiac care (n=54, 58.2%), psychiatric (n=47, 50.5%), and obstetrics (n=45, 48.2%). The least common specialty units were diabetic (n=23, 25%), rehabilitation (n=24, 26%), and geriatric (n=18, 19%). Renal or dialysis units were found in 35% of the participating hospitals. Pediatric units were in (n=40, 43%) of the hospitals. Twenty-nine (31%) of the participating hospitals had long term care units. Other specialty units were listed by participating dietitians. Eight (9%) of the hospitals participating in the survey had oncology units. There were neonatal intensive care units in five of the hospitals. Substance abuse units were found in four of the hospitals. Other specialty units that were listed included burn; transplant; spinal cord injury; eye, ear, nose, and throat; chronic vent; eating disorders; and neurology.

Additional hospital profile information included number of daily admissions, and number of daily screens performed. The mean number of patients admitted daily to the hospitals participating in the survey was 18.2 ± 15.9 (range: 1-80). There was a mean of 11.6 ± 11.4 daily nutritional screens performed in the hospitals surveyed (range: 0-60).

Information was collected on the clinical dietetics staff in the departments of the hospitals surveyed. There was a mean of 2.4 ± 2.3 clinical dietitians on the staff of the hospitals (range: 0-17). The mean number of dietitian technicians was 0.4 ± 0.9 (range: 0-5). The mean number of dietitian assistants was 0.7 ± 1.5 (range: 0-8). The mean number of dietary clerks was 1.4 ± 1.9 (range: 0-10). The average number of dietetic students was $.34 \pm 1.4$ (range: 0-5). The average number of volunteers was 0.5 ± 1.3 (range: 0-8).

Significant Associations

There were a significant associations between large and small hospitals in the following nutritional screening practices: rescreening of patients with extended length of stay, and use of computers for nutritional screening. The associations between hospital size and nutritional screening practices are shown in Table 1.

Re-screening of patients occurred in 40 (60.6%) of the small hospitals while 8 (32%) of the large hospitals had re-screening policies. There was use of computers for nutritional screening in 17 (68%) of the large hospitals and use of computers in 13 (19.7%) of the small hospitals.

Table 1. COMPARISON OF NUTRITIONAL SCREENING PRACTICES BY HOSPITAL SIZE

<u>Policy</u>	<u>% Affirmative Small Hospitals</u>	<u>% Affirmative Large Hospitals</u>
Standard policies	80.3	88
Standard form	66.7	60
Re-screening	60.6*	32*
Use of computers	19.7*	68*
Specialty policies	012.1	28
Specialty form	7.6	12

p≤.05 by Chi-square analysis.

Another significant association was found between hospital size and the clinical staff participating in the nutritional screening process. The participation of dietetic technicians and dietetic students was found to be significantly associated in large and small hospitals. The comparison between hospital size and clinical staff participating in nutritional screening is shown in Table 2. Dietetic technicians participated in screening in 10 (40%) of the large hospitals and in 11 (16.7%) of the small hospitals. Dietetic students participated in screening in 8 (32%) of the large hospitals and they participated in 3 (4.5%) of the small hospitals.

The comparison of hospital size and use of abnormal findings for screening is shown in Table 3. The only statistically significant associations in this area were that small hospitals used hematocrit and hemoglobin more than large hospitals in determining nutritional risk. Hemoglobin was used in 6 (24%) of the large hospitals to determine a patient's nutritional risk. It was used in 34 (51.5%) of the small hospitals. Hematocrit was used in 36 (54.5%) of the small hospitals and only 5 (20%) of the large hospitals used it to determine nutritional risk.

Because no other significant associations were found between large and small hospitals, the remainder of the results will be treated as one group of hospitals. Results will be reported for the entire sample of 91 hospitals that responded to the survey.

**Table 2 . COMPARISON OF PERCENTAGE CLINICAL STAFF PARTICIPATING
IN NUTRITIONAL SCREENING BY HOSPITAL SIZE**

<u>Clinical Staff</u>	<u>Participation Small Hospitals</u>	<u>Participation Large Hospitals</u>
Dietitian	87.9	92
Diet. Technician	16.7*	40*
Diet. Assistant	12.1	16
Nurses	45.5	36
Admitting	4.5	8
Dietetic Students	4.5*	32*
Volunteers	0	4

p<.05 by Chi-square analysis.

Table 3. COMPARISON OF HOSPITAL SIZE AND USE OF ABNORMAL FINDINGS IN NUTRITIONAL SCREENING

<u>Abnormal Finding</u>	<u>% Indicating Use Small Hospitals</u>	<u>% Indicating Use Large Hospitals</u>
Albumin	89.4	80
Cholesterol	57.6	44
Glucose	62.1	40
Hematocrit	54.5*	20*
Creatinine	36.4	20
Hemoglobin	51.5*	24*
BUN	42.4	36
Transferrin	16.7	4
Weight Loss	92.4	84
Hydration	39.4	28
Weight for Height	78.8	68

p<.05 by Chi-square analysis.

Screening Forms and Policies

Information was collected on the use of standard screening forms and written policies for nutritional screening. Seventy-five (82.4 %) of the hospitals represented in the survey had written screening policies. In 59 of the hospitals (64.8 %) a standard form was used for nutritional screening. Only 15 (16.5 %) of the hospitals surveyed had written policies for nutritional screening in specialty units. Eight hospitals (8.8%) had specific forms for nutritional screening used in specialty units.

Each chief clinical dietitian participating in the survey was asked on what basis newly admitted patients are selected for nutritional screening. The three most often selected bases for screening newly admitted patients were all are screened (n=44, 47.3%), diagnosis related (n=42, 45.1%), and physician referral (n=38, 40.7%). These results are shown in Table 4. The chief dietitians were also asked how soon after admission these newly admitted patients were screened. As shown in Table 5, in 52 (57.1%) of the hospitals, the newly admitted patients were screened within 24 to 48 hours after admission. Screening was performed within 49 to 72 hours after admission in 27 (29.7%) of the hospitals. In four hospitals (4.4%) the newly admitted patients were screened 72 hours or more after admission.

There were eight responses in the other category for the survey question about how soon after admission newly admitted patients are screened. Two of the eight responses were accompanied by an explanation. One response indicated that time limits for screening are dependent on the risk category that the patient is assigned. Each patient is assigned a risk category and these categories have established screening time limits. The other response was that

Table 4. BASIS FOR SCREENING SELECTION

<u>Basis Factor</u>	<u>Hospitals</u>	
	<u>Number</u>	<u>Percentage</u>
All screene	43	47.3
Diagnosis related	41	45.1
Physician referral	37	40.7
Nursing referral	35	38.5
Diet order	35	38.5
Dietitian selection	31	34.1
Length of stay	23	25.3
Diet technician selection	12	13.2
Floor/room assignment	4	4.4

Table 5. TIME LAPSE AFTER ADMISSION BEFORE SCREENING

<u>Time</u>	<u>Number</u>	<u>Hospitals</u>	<u>Percentage</u>
24-48 hours	52		57.1
49-72 hour	27		29.7
more than 72 hours	4		4.4

patients are screened within 72 hours if they are admitted on weekends. This response indicates that there is a different screening time policy for weekends. Staffing limitations on weekends may cause this difference in screening times.

The total time for screening of one patient is found in Table 6. The time most often indicated was 15 to 19 minutes by 23 (25.6 %) of the hospitals. The least common total screening time was 20 to 24 minutes indicated by 13 (14.4 %) hospitals. The longest screening time listed was 25 or more minutes. In 19 (21.1 %) of the hospitals surveyed, the entire nutritional screening process for one patient took 25 minutes or more.

Forty-six samples of nutritional screening policies and 45 sample screening forms were submitted along with completed surveys. There were four(4.3%) hospitals that had samples of screening policies for specialty units. The policies were for mental health, neonatal intensive care, pediatrics, and women's health units. There were five (5.4%) sample screening forms submitted for specialty units. These forms were for mental health, oncology, neonatal, pediatrics, and fall risk and skin care (geriatrics) screening. Sixteen of the dietitians that responded to the survey stated that the screening policies at the hospitals where they worked were in the process of or had recently been revised. Eighteen (19 %) of the hospitals participating in the survey had newly developed screening policies or forms.

Table 6. TOTAL SCREENING TIME PER PATIENT

<u>Time</u>	<u>Hospitals</u>	
	<u>Number</u>	<u>Percentage</u>
15-19 minutes	23	25.6
25 or more minutes	19	21.1
10-14 minutes	18	20
less than 10 minutes	17	18.9
20-24 minutes	13	14.4

There were many different nutritional screening forms that were submitted as samples (n=45). Most of the them appeared on standard full size pages of paper. Twenty (44.4%) of these screening forms were documents for the patient's medical record; and 24 (53.3%) were for the records of the clinical dietetics staff only and not part of the patient's medical records. There were several screening forms that were different in appearance. Two (4.4%) of them were a smaller size that fit in a cardex. One (2.2%) screening form appeared as an attractive pamphlet with questions for the patients to answer. The smallest screening form was a sticker that could be inserted easily in the medical record. Seven (15.5%) of the forms were printed by computer.

Data collection on the screening forms was done by several different methods: fill in the blank (n=20, 44.4%), yes or no questions(n=9, 20%), and checklists (n=16, 35.6%). The screening data were summarized and reported by several methods. Five (11.1%) of the screening forms appeared in SOAP format and could be readily inserted in the patient's medical record. Six (13.3%) of the hospitals surveyed used the same form for nutritional screening and nutritional assessment. Screening information was included as part of the nutritional assessment. Screening data was summarized by determining the nutritional risk on eight (17.8%) of the forms. The nutritional risk was determined by the score from a point system on five (11.1%) of these screening forms. In two (4.4%)hospitals the nursing staff completed screening forms, and referred patients in need of nutritional care to the dietitian .

Staff Participation and Their Roles

The clinical staff participating in nutritional screening and the activities they performed during nutritional screening were looked at in the survey. In 81 (89 %) of the hospitals represented, dietitians participated in the nutritional screening process. Nurses and nursing assistants participated in the screening process in 39 (42.9 %) hospitals, and dietitian assistants and clerks participated in 12 (13.2 %) of the hospitals. Staff from admitting and registration participated in nutritional screening in only 5 (5.5 %) of the hospitals. Only in one (1.1 %) hospital did volunteer staff participate in nutritional screening.

The results of the survey question dealing with activities performed during nutritional screening are shown in Table 7. The screening activities included in the survey list were measurement of height and weight, patient interview, recording and transcription of lab and medical data, and interpretation of screening information. Dietitians interviewed patients in the screening process in 45 (49.5 %) of the hospitals and interpreted screening information in 71 (79.8 %) of the hospitals. Nurses and nursing assistants measured height and weight in 48 (52.7 %) hospitals. Some of the listed activities were not performed during nutritional screening in the hospitals. For example, measurement of height and weight was not performed in 32 (35.2 %) of the hospitals, patient interview was not performed in 13 (14.3 %) of the hospitals, recording and transcription of labs and medical data was not performed in 24 (26.4%) of the hospitals, and interpretation of screening information was not performed in 10 (11.2%) of the hospitals.

Table 7. SCREENING TASKS AND STAFF PERFORMANCE

<u>Task</u>	<u>Staff</u>	<u>Hospitals</u>	
		<u>Number</u>	<u>Percentage</u>
Measurement height, weight	Nursing	48	52.7
	Not Performed	32	35.2
	Dietitian	9	9.9
	Dietetic Technician	1	1.1
	Admissions	1	1.1
Patient Interview	Dietitian	45	49.5
	Nursing	20	22
	Not Performed	13	14.3
	Dietetic Technician	8	8.8
	Dietitian Assistant	2	2.2
	Admissions	2	2.2
	Diet Clerk	1	1.1
Recording Lab and Medical Data	Dietitian	38	41.8
	Not Performed	24	26.4
	Nursing	10	11
	Lab Personnel	7	7.7
	Dietetic Technician	5	5.5
	Transcription Clerk	4	4.4
	Dietitian Assistant	1	1.1
	Medical Doctor	1	1.1
	Medical Technician	1	1.1
Interpretation of Screening information	Dietitian	71	79.8
	Not Performed	10	11.2
	Dietetic Technician	3	3.4
	Nursing	3	3.4
	Medical Doctor	2	2.2

Routine Screening

The items evaluated in a routine nutritional screening was another important topic examined in this study. The three most common items evaluated in the routine nutritional screening were weight, height, and lab results. The least common items evaluated in the routine screening were the physical exam, social history, and activity level. The actual number and percentage of routine items evaluated in screening are shown in Table 8. Weight (n=33, 35.2 %) and height (n=25, 26.7 %) were items most often missing or not available when a routine screening was performed. Lab results were reported most often missing or unavailable by (n=9, 9.9 %) of the survey participants.

There were a wide variety of responses in the other category for items evaluated in the routine screening. The most common responses were primary diagnosis, oral intake, age, weight history, and nausea, vomiting, or diarrhea. There were two responses of level of education and literacy. Need for nutrition education was evaluated at two hospitals. Religious or ethnic background and cultural habits were evaluated in screening at three hospitals. The patient's appetite was evaluated in screening in two hospitals.

Table 8. ITEMS EVALUATED IN ROUTINE SCREENING

	<u>Hospitals</u>	
<u>Item</u>	<u>Number</u>	<u>Percentage</u>
Weight	81	89
Height	79	86.8
Labs	78	85.7
Swallowing problems	73	80.2
Diet order	72	79.1
Dental, chewing problem	71	78
Food allergies	60	65.9
Medical history	60	65.9
Diet history	56	61.5
Medications	53	58.2
Food Preferences	47	51.6
Skin condition	40	44
Diagnostic test result	36	39.6
Physical exam	33	36.3
Social history	32	35.2
Activity level	24	26.4
Other	13	14.3

Abnormal Findings

The number and percentage for the abnormal findings used to determine a patient's nutritional risk is shown in Table 9. Serum albumin was used as an abnormal finding in 79 (86.8 %) of the hospitals. The other lab values that were used often were blood glucose (n=52, 56 %) and cholesterol (n=50, 53.8%). Besides using lab values, two findings related to a patient's weight were used frequently to determine nutritional risk. Weight loss was used in 82 (90.1 %) of the hospitals as an abnormal finding. Weight for height was used in 69 (75.8 %) of the hospitals to determine nutritional risk.

In response to the question regarding what abnormal findings are used to determine nutritional risk some hospitals listed other findings: primary diagnosis (n=4, 4.3%), total lymphocyte count (n=5, 5.4%), and prealbumin and total protein (n=3, 3.2%). Percent of ideal body weight, poor food intake, and diet order were listed each by two (2.2%) hospitals in the survey.

Regulations of the Joint Commission on Accreditation of Healthcare Organizations (JACHO)

There were only two sections of the 1995 JACHO standards that refer to nutritional screening (11). The first section under the heading of initial assessment stated that the initial screening must determine: the need for further assessment, the need for care, and the type of care to be provided. The second section referring to screening stated the need for assessment of the patient's nutritional status must be determined.

Table 9. ABNORMAL FINDINGS USED TO DETERMINE NUTRITIONAL RISK

<u>Abnormal Findings</u>	<u>Hospitals</u>	
	<u>Number</u>	<u>Percentage</u>
Weight loss	82	90.1
Albumin	79	86.8
Weight for height	69	75.8
Blood Glucose	51	56
Cholesterol	49	53.8
BUN	37	40.7
Hydration Status	33	36.3
Transferrin	12	13.2
Other	12	13.2

All of the sample nutritional screening policies and forms submitted for review did comply with these standards. There were a variety of methods used at each hospital to determine a patient's need for further nutritional assessment, need for care, and type of care to be provided. Thirty-three (71.7%) of the hospitals had nutritional screening policies that used disease states and nutritional risk factors to classify newly admitted patients. The patients were assigned to a specific level of care according to the disease states or rating of nutritional risk factors. The nutritional screening policies stated the type of care, including further screening, that would be provided for each level of care. The other hospitals had screening policies that prioritized patients according to the length of stay, lab results, or diet orders.

DISCUSSION AND CONCLUSIONS

By analyzing the relationship between nutritional screening and hospital size, it was found that there were only a few associations between small and large hospitals in nutritional screening practices (i.e.; regarding re-screening, computer use, the clinical staff performing screening, and the use of hemoglobin and hematocrit to determine nutritional risk). These associations that exist may be due to the different resources that are available for nutritional screening. These resources include clinical staff, laboratory results, and computer technology.

Screening Resources

The technology of computers is beginning to find its way into the nutritional screening process. Seventeen large hospitals (68 %) use computers some way in the screening process. These larger hospitals may have hospital wide computer systems that provide services that are used in the screening process. Small hospitals may not have access to any computer services. Only 13 (19.7 %) of small hospitals use computers in nutritional screening. Computers are used in the nutritional screening process in many ways. Computers print screening forms with screening data available such as patient's age, diagnosis, weight, and laboratory results. Computers generate lists of patients with certain defined criteria such as high risk diagnosis or low serum albumin. Computers can be used to access information about patients such as diagnosis, length of stay, body weight and height, and laboratory results. The patient's ideal body weight may even be calculated by the computer. In one of the hospitals surveyed nurses use bedside computers and provide nutrition information to the

dietitians that is helpful in identifying patients at nutritional risk. A list of patients needing drug-nutrient interaction counseling is provided by computer in one Virginia hospital.

The resources for laboratory results are different in small and large hospitals. At smaller hospitals they may depend more on simple routine laboratory results such as hematocrit and hemoglobin. These simple blood tests may be readily available. These abnormal findings are used significantly more often in small hospitals to determine nutritional risk. For example, 5 (20%) of the large hospitals use hematocrit and 6 (24%) use hemoglobin. Hematocrit is used by 36 (54.5%) of the small hospitals and hemoglobin is used by 34 (51.5%) of the small hospitals. In large hospitals hematocrit is used by 20% and hemoglobin by 24% to determine nutritional risk in screening. Cost may play a big part in determining which laboratory tests are available to determine nutritional risk. Small hospitals may have to rely on hematocrit and hemoglobin levels rather than more expensive tests such as prealbumin.

Clinical staff is a very important screening resource. In large hospitals there is more participation in screening by dietetic technicians and dietetic students. Small hospitals may not even have these positions on the clinical staff. Large hospitals may be teaching institutions with several dietetic students. The large hospitals may employ dietetic technicians to assist dietitians with their clinical tasks. Ten (40%) of the large hospitals indicated that dietetic technicians participated in screening while only 11 (16.7%) of the small hospitals indicated participation of dietetic technicians. Dietetic students participated in 8 (32%) of the large hospitals, and these students were found to participate in only 3 (4.5%) of small hospitals in nutritional screening.

Dietitian's Role

Dietitians perform many of the tasks in hospital nutritional screening. Their main responsibilities in screening are interpretation of screening information, recording and transcription of lab and medical data, and patient interview. The tasks that they perform for screening are in addition to their other clinical duties including patient nutritional assessment. The time that dietitians devote to screening takes away from their time for patient nutritional assessment. Dietitians need to review the screening policies and practices that they are using on a regular basis to make sure that they are efficient in use of time and resources.

The Role of Others

Nurses and dietetic technicians perform duties that assist dietitians with screening. In 30 (45.5 %) of the small hospitals and 8 (32 %) of the large hospitals nursing participated in nutritional screening. Measurement of height and weight was the major screening task performed in 48 (52.7%) of the hospitals by nursing. Patient interview was performed by dietetic technicians in 8 (8.8%) of the hospitals surveyed. None of the other screening tasks listed in the survey were performed by many dietetic technicians in the hospitals. The other tasks frequently performed by the dietetic technicians in nutritional screening besides patient interview were not determined in this survey.

The role of the other clinical staff in nutritional screening is important. Other nutrition department staff members and staff from other departments can participate in screening and help increase the efficiency. A multi-disciplinary approach to screening may allow staff from other departments to collect

information that can be used by dietitians in screening. This would allow dietitians to spend less time screening and devote more time to nutritional assessment.

Dietetic technicians should be able to perform many of the screening tasks. The role of the dietetic technician in nutritional screening was unclear in this survey. It did not appear that ,presently, dietetic technicians were performing many screening tasks. There is a need to clarify and expand the role of dietetic technicians in the screening process.

Screening of Specialty Units

Only 15 (16.5%) hospitals had specific screening policies for use in the specialty units and 8 (8.8%) hospitals had specific screening forms to be used in the specialty units. Most of the hospitals had written screening policies and standard forms that were used for nutritional screening of all newly admitted patients regardless of the special care that they would be provided or the unit that they would be admitted to. Revision of these policies and forms for screening was either recently completed or was in progress at the time of the survey at 16 (17.6%) hospitals.

Screening Time

The total time for the nutritional screening of one patient in hospitals varied. In 17 (18.9 %) of the hospitals the total screening time for one patient was 10 minutes or less. In 19 (21.1 %) of the hospitals, the total screening time for each patient was 25 or more minutes. The time indicated by most of the hospitals was 15 to 19 minutes.

Comparison of Research Studies

The height and weight of patients was found to be missing most often in research studies on nutritional screening. Butterworth and Prevost (1,2) reviewed the medical and surgical records of 80 patients hospitalized two or more weeks and revealed the height was not recorded 56% of the time and body weight was not recorded 23% of the time. Hedberg and associates (17) found incomplete height and weight data for 52.4% of patients screened during a 1985 study of 225 participants and 72.3% with incomplete height and weight records in the follow-up study of 488 participants. In the study by Kamath and associates (15) of 3,047 patients, height was missing in 35.2% and weight in 36.7%. These data were collected within 48 hours of admission at 33 hospitals by questionnaires completed by the clinical nutrition administrators of the hospitals. The survey of hospitals in the state of Virginia was conducted in a similar way with questionnaires completed by the chief clinical dietitians at the 91 participating hospitals. The Virginia study found that height and weight were the most common missing information during nutritional screening. In the study by Hedberg and associates (17), the total screening time per patient was found to be an average of fifteen minutes for screens performed by the dietetic technicians. The Virginia research found the most often indicated screening time for a patient was 15 to 19 minutes. This screening time was not given specifically for dietetic technicians. It was an average time for all personnel involved.

In a questionnaire survey by Schiller (20), information on screening was collected. The survey included responses from all of the states except Montana. Twenty-seven point six percent of the sample had more than 500 beds; and 32% had 151 to 300 beds; and 6.2% had 150 or fewer beds. In the Virginia research

study, 60.2 % had between 0 and 150 licensed beds, 23.1% had between 151 and 300 beds. There were only 8.8% with between 301 and 500 beds and 4.4% with between 501 and 650 beds. The Schiller study (20) found that in 43.9 % of the large hospitals (with 300 or more beds) and 46.4 % of the small hospitals (with less than 300 beds) ,all newly admitted patients were screened. The Virginia survey had results consistent with these findings. The Virginia study found that 47.3% of the hospitals had nutritional screening policies.

Foltz and associates (21) conducted a questionnaire survey to study screening and assessment practices. The questionnaire was sent to 988 members of the Dietitians in Nutrition Support, a practice group of the American Dietetics Association. The dietitians that responded represented community hospitals, academic health centers, government hospitals, pediatric hospitals, and long term care facilities. Most of the hospitals represented were general acute care facilities with between 201 and 500 licensed beds. The study by Foltz and associates (21) found that all newly admitted patients were screened in 61.2%.. These findings were similar to the findings of the Virginia study. All patients were screened in 47.3% of the hospitals. Physician referral accounted for 40.7% the basis for nutritional screening in the Virginia study. In the study by Foltz and associates (21), only 2.6% were screened because of physician referral. The results of the Virginia survey and the findings from the study by Foltz and associates (21) were very similar regarding items included in routine nutritional screening. Weight and height were the two most often included items in routine nutritional screening in both studies. Several items that were near the top of the list for most often included in the routine screening in the Virginia study were not near the top in the study by Foltz and associates (21). For example ,in the Virginia study swallowing

problems was an item included in a routine screen in 80.2 % of the hospitals while in the study by Foltz and associates (21) it was included in 3.9% of the hospitals. Diet order was given in 79.1% of the Virginia hospitals and in the research by Foltz and associates (21) it was given by only 4.1 % of the hospitals. The differences in the sizes of hospitals participating in the studies may account for these different findings. The research by Foltz and associates (21) represented more larger hospitals than the Virginia study.

In the Virginia study dietitians were found to participate in screening at between 41.8 and 79.8% of the hospitals depending on the screening task. In the study by Foltz and associates (21) , dietitians were involved in screening in 46% of the hospitals. Participation of dietetic technicians in nutritional screening was found at 19.6% of the hospitals surveyed by Foltz and associates (21). This is much higher than the 1.1% to 8.8% range in the Virginia study. Again hospital size may make a difference in these findings. Also the research by Foltz and associates (21) had responses from 19.8% dietitians who were employed at academic health centers. These facilities may be more likely to train and employ dietetic technicians than smaller hospitals.

The similarities found in the research on nutritional screening reveal the following trends in the field: nutritional screening is a routine part of the nutritional care. Dietitians have the major responsibility for performing nutritional screening. Dietitians are assisted in some places by dietetics technicians. The items most often used in hospital nutritional screening are the height and weight of the patients.

Conclusions

Nutritional screening was performed in most of the hospitals surveyed in Virginia. Written screening policies were part of nutrition department's policies and procedures for nutritional care. A standard screening form for hospital use would collect the following information: height, weight, labs, swallowing, dental or chewing problems, food allergies, medical history, diet history, medications, and food preferences. With the collection of these data, the nutritional risk of a patient was determined by a dietitian. Abnormal findings of weight loss, albumin, weight for height, and blood glucose were used to determine the nutritional risk.

Dietitians had the major role in hospital nutritional screening. There was some screening done by others such as nurses and dietetic technicians. Dietitians are beginning to use computers to assist them with the screening process.

More research is needed in the field of screening. How is nutritional screening different in hospitals providing different types of patient care? For example, is nutritional screening different in a children's hospital? In this survey the research was limited to the State of Virginia. Is nutritional screening similar throughout the United States? Are there regional or statewide trends in nutritional screening? Is there a need for more standardized screening processes? What is the role of dietetic technicians in the screening process? These questions and many more are left for future research in the field of nutritional screening.

As the JCAHO regulations for hospital care change yearly, nutritional screening policies and practices are updated to meet the changes. What will be the future trends in nutritional screening? Computers are very efficient in collecting information. Computers can be used to compile lists of patients at nutritional risk using parameters determined by dietitians. The complete screening process could

be performed using a computer. In the future there also may be a multi-disciplinary approach to screening. In hospitals, departments will pool their resources to allow for the most cost effective operations. Nursing staff, when admitting a patient, may collect information that can be used by dietitians in screening. The laboratory department may be able to provide a list to dietitians of patients at nutritional risk according to abnormal lab results. This may even spread beyond single hospitals to units of several hospitals. These hospitals may band together sharing their resources for nutritional care. These hospitals will work together in developing efficient and cost effective methods for nutritional screening.

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Appendix A

IF THERE IS NO NUTRITION SCREENING PROGRAM AT THE HOSPITAL WHERE YOU WORK, PLEASE COMPLETE ONLY QUESTIONS ONE THROUGH FOUR.

1. How many licensed beds are there in the hospital where you are employed, and on an average day, how many beds are occupied?
(Circle one best answer in each column.)

NUMBER LICENSED BEDS

- 1. 0-150
- 2. 151-300
- 3. 301-500
- 4. 501-650
- 5. 651 OR MORE

AVERAGE NUMBER OCCUPIED BEDS

- 1. 0-150
- 2. 151-300
- 3. 301-500
- 4. 501-650
- 5. 651 OR MORE

2. How many inpatient clinical dietitian positions are there at the hospital where you work?

(Please indicate the answer in the space provided below.)

1. _____

3. When the department is fully staffed, how many people support the clinical dietetics staff? (Please indicate in the space provided the number of people in each of the positions listed below. If there are no people in a position, enter 0.)

- 1. DIET CLERKS _____
- 2. DIET ASSISTANTS _____
- 3. DIET TECHNICIANS _____
- 4. DIETETIC STUDENTS _____
- 5. OTHERS, PLEASE SPECIFY _____

4. What specialty units does the hospital where you are employed have? (Please circle all that apply.)

- 1. INTENSIVE CARE
- 2. RENAL/DIALYSIS
- 3. ORTHOPAEDIC
- 4. DIABETIC
- 5. OBSTETRIC
- 6. REHABILITATION
- 7. CARDIAC
- 8. PEDIATRIC
- 9. LONG TERM CARE
- 10. PSYCHIATRIC
- 11. GERIATRIC
- 12. OTHERS, PLEASE LIST _____

IF YOU HAVE NO SCREENING PROGRAM AT THE HOSPITAL WHERE YOU WORK, YOU HAVE COMPLETED THE QUESTIONNAIRE. THANK YOU. PLEASE RETURN IT IN THE ENCLOSED ENVELOPE. IF YOU HAVE A SCREENING PROGRAM, PLEASE CONTINUE TO ANSWER THE QUESTIONS BELOW. THANK YOU.

5. Does the department in the hospital where you work have written screening policies?
1. Yes
 2. No
6. Does the department in the hospital where you work use a standard form for nutritional screening?
1. Yes
 2. No

IF YOU ANSWERED YES TO QUESTIONS 5 AND/OR 6, WOULD YOU PLEASE INCLUDE A SAMPLE COPY OF THE WRITTEN POLICIES FOR SCREENING AND/OR THE STANDARD FORM USED FOR SCREENING IN THE RETURN ENVELOPE WITH THE COMPLETED QUESTIONNAIRE? THANK YOU. PLEASE CONTINUE TO ANSWER THE QUESTIONNAIRE.

7. On what basis are newly admitted patients selected for screening? (Circle all that apply.)

1. ALL ARE SCREENED.
2. PHYSICAL REFERRAL
3. NURSING REFERRAL
4. DIETITIAN SELECTION
5. OTHER, PLEASE LIST _____

8. How soon after admission are newly admitted patients screened? (Circle one best answer.)

1. 24-48 HOURS
2. 49-72 HOURS
3. MORE THAN 72 HOURS
4. OTHER, PLEASE LIST _____

9. What items are evaluated in routine screening? (Circle all that apply.)

- | | |
|-----------|----------------------|
| 1. HEIGHT | 9. FOOD ALLERGIES |
| 2. WEIGHT | 10. FOOD PREFERENCES |

- 3. PHYSICAL EXAM
 - 4. MEDICATIONS
 - 5. DIET ORDER
 - 6. MEDICAL HISTORY
 - 7. DIET HISTORY
 - 8. SOCIAL HISTORY
 - 11. DENTAL CHEWING PROBLEMS
 - 12. SWALLOWING PROBLEMS
 - 13. ACTIVITY LEVEL
 - 14. SKIN CONDITION
 - 15. LAB RESULTS
 - 16. DIAGNOSTIC TEST RESULTS
 - 17. OTHERS, PLEASE LIST _____
-
-

10. During screening, what abnormal findings do you use to determine a patient's nutritional risk? (Circle all that apply.)

- 1. ALBUMIN
 - 2. CHOLESTEROL
 - 3. BLOOD GLUCOSE
 - 4. HEMATOCRIT
 - 5. CREATININE
 - 6. HEMOGLOBIN
 - 7. BUN (Blood Urea Nitrogen)
 - 8. TRANSFERRIN
 - 9. WEIGHT LOSS
 - 10. HYDRATION STATUS
 - 11. WEIGHT FOR HEIGHT
 - 12. OTHERS, PLEASE LIST _____
-
-

11. Which one of the following items is most often missing or not available when a routine screen is performed at the hospital where you work? (Circle only one best answer.)

- 1. HEIGHT
 - 2. WEIGHT
 - 3. PHYSICAL EXAM
 - 4. MEDICATIONS
 - 5. DIET ORDER
 - 6. MEDICAL HISTORY
 - 7. DIET HISTORY
 - 8. SOCIAL HISTORY
 - 9. FOOD ALLERGIES
 - 10. FOOD PREFERENCES
 - 11. DENTAL CHEWING PROBLEMS
 - 12. SWALLOWING PROBLEMS
 - 13. ACTIVITY LEVEL
 - 14. SKIN CONDITION
 - 15. LAB RESULTS
 - 16. DIAGNOSTIC TEST RESULTS
 - 17. OTHERS, PLEASE LIST _____
-
-

12. Who are the people that participate in the screening process? (Circle all that apply.)

- 1. DIETITIANS
- 2. DIET TECHNICIANS
- 3. DIET ASSISTANTS, CLERKS
- 4. NURSES, NURSING ASSISTANTS
- 6. DIETETIC STUDENTS
- 7. VOLUNTEERS

5. ADMITTING, REGISTRATION CLERKS

8. OTHERS, PLEASE LIST _____

13. On the line for each activity listed below, please indicate the title of the person performing that activity in the hospital where you work. If the activity is not performed at the hospital where you work, enter a 0 on the line.

1. MEASUREMENT OF HEIGHT AND WEIGHT _____
2. PATIENT INTERVIEW _____
3. ANTHROPOMETRIC MEASUREMENTS _____
4. RECORDING AND TRANSCRIPTION OF LAB AND
MEDICAL DATA _____
5. INTERPRETATION OF SCREENING INFORMATION _____

14. After the screening information is collected, how is it interpreted? (Briefly describe in the space provided.)

15. Estimate how long it takes to complete the screening process including the time to collect the data and interview the patient, if needed. (Circle only one best answer in each column.)

DATA COLLECTION TIME:

1. LESS THAN 10 MINUTES
2. 10 TO 14 MINUTES
3. 15 TO 19 MINUTES
4. 20 TO 24 MINUTES
5. 25 OR MORE MINUTES

INTERVIEW (IF NEEDED):

1. LESS THAN 10 MINUTES
2. 10 TO 14 MINUTES
3. 15 TO 19 MINUTES
4. 20 TO 24 MINUTES
5. 25 OR MORE MINUTES

16. On the average, how many screens are performed daily? (Please indicate the number in the space provided.)

1. _____

17. Do you use computers in the screening process? If yes, briefly state how in the space provided below.

1. NO

2. YES _____

18. Does the department in the hospital where you work have any written policies for screening of specialty units?

- 1. YES
- 2. NO

19. Does the department in the hospital where you work have any specific forms for screening of specialty units?

- 1. YES
- 2. NO

IF YOU ANSWERED YES TO QUESTIONS 18 AND/OR 19, PLEASE INCLUDE A SAMPLE COPY OF THE WRITTEN POLICIES FOR SPECIALTY UNITS AND/OR ANY SPECIFIC SCREENING FORMS USED IN SPECIALTY UNITS IN THE RETURN ENVELOPE. THANK YOU.

THANK YOU FOR COMPLETING THE QUESTIONNAIRE. PLEASE RETURN IT, ALONG WITH THE SAMPLE COPIES OF WRITTEN SCREENING POLICIES, STANDARD SCREENING FORMS, WRITTEN POLICIES FOR SCREENING OF SPECIALTY UNITS, AND SPECIFIC SCREENING FORMS FOR SPECIALTY UNITS, IN THE ENCLOSED ENVELOPE.

Appendix B

December 1, 1994

Dear Chief Clinical Dietitian,

There are many methods and practices for nutritional screening. The purpose of this study is to collect information on hospital screening practices. You are invited to share your department's screening practices by answering the enclosed questionnaire.

Your responses will be kept confidential, and you and your hospital will not be associated with the information. A number will serve as identification and be used for follow-up purposes only.

A summary of the results will be available. If you would like one, please put your name and address on the back of the return envelope.

Thank you in advance for completing the questionnaire and returning it in the stamped addressed envelope. If the hospital where you work does not have a nutritional screening program, you are asked to complete only questions one to four.

Please do not hesitate to call me at 703-644-1127 if there are any further questions regarding this questionnaire.

Sincerely,

Mary Ann Novascone, Ph.D., R.D.
Graduate Advisor

Emily Furtek, R.D.
Graduate Student

Appendix C

December 1, 1994

Dear Nutrition Professional,

There are many methods and practices for nutritional screening. The purpose of this study is to collect information on hospital screening practices. The enclosed questionnaire is the instrument designed to collect information on nutritional screening. You are invited to review the questionnaire and to provide suggestions or comments for improvement of the instrument.

Thank you in advance for reviewing the questionnaire and returning it in the stamped envelope with written comments or suggestions on it. If there are any questions, please do not hesitate to call me at 703-644-1127.

Sincerely,

Mary Ann Novascone, Ph.D., R.D.
Graduate Advisor

Emily Furtek, R.D.
Graduate Student

Appendix D

A SURVEY OF NUTRITIONAL SCREENING PRACTICES
IN HOSPITALS IN VIRGINIA

1. How many licensed beds are there in the hospital where you are employed, and on an average day, how many beds are occupied? (Circle one best answer in each column.)

NUMBER LICENSED BEDS	AVERAGE NUMBER OCCUPIED BEDS
1. 0-150	1. 0-150
2. 151-300	2. 151-300
3. 301-500	3. 301-500
4. 501-650	4. 501-650
5. 651 OR MORE	5. 651 OR MORE

2. On an average day, how many patients are admitted? (Please indicate number in the space provided.)

1. _____
2. DO NOT KNOW

3. What specialty units are there in the hospital where you are employed? (Circle all that apply.)

- | | |
|-------------------|-------------------------|
| 1. INTENSIVE CARE | 7. CARDIAC |
| 2. RENAL/DIALYSIS | 8. PEDIATRIC |
| 3. ORTHOPAEDIC | 9. LONG TERM CARE |
| 4. DIABETIC | 10. PSYCHIATRIC |
| 5. OBSTETRIC | 11. GERIATRIC |
| 6. REHABILITATION | 12. OTHERS, PLEASE LIST |

4. When the department is fully staffed, how many people are there on the clinical dietetics staff? (Please indicate, in the space provided, the number of

people in each of the positions listed below. If there are no people in a position, enter 0.)

1. CLINICAL DIETITIANS _____
2. DIET TECHNICIANS _____
3. DIET ASSISTANTS _____
4. DIET CLERKS _____
5. DIETETIC STUDENTS _____
6. VOLUNTEERS _____

5. Does the department in the hospital where you work have written nutritional screening policies?

1. YES
2. NO

6. Does the department in the hospital where you work use a standard form for nutritional screening?

1. YES
2. NO

IF YOU ANSWERED YES TO QUESTIONS 5 AND/OR 6, WOULD YOU PLEASE INCLUDE A SAMPLE COPY OF THE WRITTEN POLICIES FOR SCREENING AND/OR THE STANDARD FORM USED FOR SCREENING IN THE RETURN ENVELOPE WITH THE COMPLETED QUESTIONNAIRE? THANK YOU. PLEASE CONTINUE.

7. Does the department in the hospital where you work have a policy for re-screening of patients with extended length of stay?

1. NO
2. YES BRIEFLY STATE THE POLICY:

8. On what basis are newly admitted patients selected for nutritional screening? (Circle all that apply.)

1. ALL ARE SCREENED
2. DIAGNOSIS RELATED SELECTION
3. PHYSICIAN REFERRAL
4. NURSING REFERRAL
5. DIETITIAN SELECTION
6. DIET TECHNICIAN SELECTION
7. LENGTH OF STAY
8. DIET ORDER
9. FLOOR/ROOM ASSIGNMENT
10. OTHERS, PLEASE LIST

9. How soon after admission are newly admitted patients screened? (Circle one best answer.)

1. 24-48 HOURS
2. 49-72 HOURS
3. MORE THAN 72 HOURS
4. OTHER, PLEASE LIST

10. What items are evaluated in routine nutritional screening? (Circle all that apply.)

- | | |
|--------------------|-----------------------------|
| 1. HEIGHT | 9. FOOD ALLERGIES |
| 2. WEIGHT | 10. FOOD PREFERENCES |
| 3. PHYSICAL EXAM | 11. DENTAL CHEWING PROBLEMS |
| 4. MEDICATIONS | 12. SWALLOWING PROBLEMS |
| 5. DIET ORDER | 13. ACTIVITY LEVEL |
| 6. MEDICAL HISTORY | 14. SKIN CONDITION |
| 7. DIET HISTORY | 15. LAB RESULTS |
| 8. SOCIAL HISTORY | 16. DIAGNOSTIC TEST RESULTS |
| | 17. OTHERS, PLEASE LIST |

11. During screening, what abnormal findings do you use to determine a patient's nutritional risk? (Circle all that apply.)

- | | |
|------------------|------------------------------|
| 1. ALBUMIN | 7. BUN (Blood Urea Nitrogen) |
| 2. CHOLESTEROL | 8. TRANSFERRIN |
| 3. BLOOD GLUCOSE | 9. WEIGHT LOSS |
| 4. HEMATOCRIT | 10. HYDRATION STATUS |
| 5. CREATININE | 11. WEIGHT FOR HEIGHT |
| 6. HEMOGLOBIN | 12. OTHERS, PLEASE LIST |

12. Which one of the following items is most often missing or not available when a routine nutritional screen is performed at the hospital where you work? (Circle only one best answer.)

- | | |
|--------------------|-----------------------------|
| 1. HEIGHT | 9. FOOD ALLERGIES |
| 2. WEIGHT | 10. FOOD PREFERENCES |
| 3. PHYSICAL EXAM | 11. DENTAL CHEWING PROBLEMS |
| 4. MEDICATIONS | 12. SWALLOWING PROBLEMS |
| 5. DIET ORDER | 13. ACTIVITY LEVEL |
| 6. MEDICAL HISTORY | 14. SKIN CONDITION |
| 7. DIET HISTORY | 15. LAB RESULTS |
| 8. SOCIAL HISTORY | 16. DIAGNOSTIC TEST RESULTS |
| | 17. OTHERS, PLEASE LIST |

13. Who on the clinical staff participates in the nutritional screening process?
(Circle all that apply.)

- | | |
|----------------------------------|------------------------------|
| 1. DIETITIANS | 6. DIETETIC STUDENTS |
| 2. DIET TECHNICIANS | 7. VOLUNTEERS |
| 3. DIET ASSISTANTS/CLERKS | 8. OTHERS, PLEASE LIST _____ |
| 4. NURSES/NURSING ASSISTANTS | _____ |
| 5. ADMITTING/REGISTRATION CLERKS | _____ |

14. On the line for each activity listed below, please indicate the title of the person performing that activity *during nutritional screening*. If the activity is not performed *during nutritional screening*, enter a "0" on the line.

1. MEASUREMENT OF HEIGHT AND WEIGHT _____
2. PATIENT INTERVIEW _____
3. RECORDING AND TRANSCRIPTION OF LAB AND MEDICAL DATA _____
4. INTERPRETATION OF SCREENING INFORMATION _____

15. Estimate how long it takes to complete the entire nutritional screening process for one patient, including the time to *collect the data and interview the patient, if needed*. (Circle only one best answer.)

TOTAL TIME FOR ONE PATIENT:

1. LESS THAN 10 MINUTES
2. 10 TO 14 MINUTES
3. 15 TO 19 MINUTES
4. 20 TO 24 MINUTES
5. 25 OR MORE MINUTES

16. On the average, how many screens are performed daily? (Please indicate the number in the space provided.)

1. _____
2. DO NOT KNOW

17. Do you use computers in the nutritional screening process?

1. NO
2. YES BRIEFLY STATE HOW: _____

18. Does the department in the hospital where you work have any written policies for nutritional screening in specialty units?

1. YES
2. NO

19. Does the department in the hospital where you work have any specific forms for nutritional screening used in the specialty units?

1. YES
2. NO

IF YOU ANSWERED YES TO QUESTIONS 18 AND/OR 19, PLEASE INCLUDE A SAMPLE COPY OF THE WRITTEN POLICIES FOR SPECIALTY UNITS AND/OR ANY SPECIFIC SCREENING FORMS USED IN SPECIALTY UNITS IN THE RETURN ENVELOPE.

THANK YOU FOR COMPLETING THE QUESTIONNAIRE! WHEN YOU RETURN IT, PLEASE INCLUDE:

WRITTEN SCREENING POLICIES
STANDARD SCREENING FORMS
WRITTEN POLICIES FOR SCREENING IN SPECIALTY UNITS
SCREENING FORMS IN SPECIALTY UNITS

Appendix E

March 13, 1995

Dear Clinical Dietitian,

There are many methods and practices for nutritional screening. We are conducting a study to collect information on hospital screening practices. You are invited to share your department's screening practices by answering the enclosed questionnaire.

Your responses will be kept confidential, and you and your hospital will not be associated with the information. A number will serve as identification and will be used for follow-up purposes only. A summary of the results will be available. If you would like one, please put your name and address on the back of the return envelope.

Thank you in advance for completing the questionnaire and returning it in the stamped, addressed envelope. Please do not hesitate to call me at (703) 644-1127 if there are any questions.

Sincerely,

Mary Ann Novascone, Ph.D., R.D.
Graduate Advisor
(703) 231-5778

Emily Furtek, R.D.
Graduate Student

Appendix F

March 27, 1995

Dear Clinical Dietitian,

This postcard is a reminder regarding the survey you received about 2 weeks ago, entitled *A Survey of Nutritional Screening Practices in Hospitals in Virginia*. If you have already completed the questionnaire and mailed it back, THANK YOU. If you have not, please complete it and return it as soon as possible.

Please contact me if you need another copy of the questionnaire or have any questions. My phone number is 703-644-1127. Thank you.

Sincerely,

Emily Furtek

Appendix G

April 17, 1995

Dear Clinical Dietitian,

Many dietitians have already responded to the survey about nutritional screening practices in Virginia hospitals. From these results, we have found that a variety of methods are used.

We are depending upon you and others who have not yet responded to do so, thus giving us the information to present a more complete description of nutritional screening practices in Virginia hospitals.

Enclosed is another copy of the questionnaire. Please return the completed questionnaire as soon as possible. If you have any questions, please contact me at 703-644-1127 or my advisor, Dr. Mary Ann Novascone at 703-231-5778.

If you wish to receive a copy of the results, please put your address on the back of the return envelope. Your participation is greatly appreciated.

Sincerely,

Mary Ann Novascone, Ph.D., R.D.

Emily Furtek, R.D.

Enclosure

Vita

Emily S. Furtek was born in Lakewood, New Jersey. She lived her entire young life there until she enrolled at Hood College in Frederick, Maryland. In May of 1975 she received her B.S. degree in Nutrition from Hood College as well as completed the Maryland Coordinated Undergraduate Program in Dietetics at the Johns Hopkins Hospital. For the past four and a half years she has been working as a clinical dietitian at Greater Southeast Community Hospital in Washington, D.C.. She lives with her husband and two teenage sons.

Emily S. Furtek