COMPARISON OF NUTRIENT INTAKE BETWEEN
SELF-FED AND STAFF-FED CVA PATIENTS

by

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STATEMENT BY AUTHOR

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ABSTRACT

This study investigates the nutritional intake of patients who have experienced a cerebrovascular accident (CVA) and have residual hemiplegia limiting the use of an upper extremity. Eighteen hospitalized CVA patients comprised the sample. Eleven of the patients fed themselves and seven were fed by the staff. The average daily consumption of calories, carbohydrate, protein, iron, calcium, and Vitamin C over a three day period was compared to the Recommended Dietary Allowance (RDA) of the National Research Council. Four patients, all self-fed, achieved an intake of 100 percent for all six nutrients.

The first hypothesis of the study, that patients who have independence in feeding themselves achieve a more adequate intake than those who are dependent upon others feeding them, was supported in relation to all nutrients except Vitamin C intake. The second hypothesis, that the nutrient intake of patients affected on the non-dominant side would be greater, was not supported for any nutrient except calcium.

Additional research could be focused on identification of the specific nutritional needs of stroke patients. Larger samples of patients and consideration of all nutrients in the diet could extend the scope of this study.
CHAPTER 1

INTRODUCTION

Many patients, such as those who have residual paralysis of an upper extremity following a cerebrovascular accident (CVA), have difficulty in self-feeding. These patients are often fed by the nursing staff or family members. However, this approach may be unsatisfactory if the patient is made to feel dependent, if the feeding process is rushed, or the patient's preferences are not considered. On the other hand, when the CVA patient is left to feed himself, he may have so much difficulty that he becomes frustrated and fatigued. In either case meals are often left unfinished, a process occurring at least three times daily which could rapidly develop unsatisfactory mealtime routines detrimental to a patient's recovery. Closer examination of feeding practices, by measuring amounts of food consumed, should give evidence as to which is the better feeding method.

Statement of the Problem

This study was designed to answer the following questions:

1. Is the diet of the CVA patient who feeds himself more nutritionally adequate than that of the patient who is fed?
2. How does intake for staff-fed and/or self-fed patients vary with affliction of the dominant or non-dominant side?

3. Does the food intake of either group of patients supply the minimal amounts of nutrients recommended by the National Research Council as necessary for body metabolism and tissue growth and repair?

4. By encouraging early independence and self-feeding, is the patient deprived of the opportunity for better nutrition?

**Significance of the Problem**

The President's Commission on Heart Disease, Cancer, and Stroke (1964, p. 12) stated that strokes (CVA) "rank third as a cause of death in the United States." The American Heart Association (1972, p. 8) used the latest available statistics, 1968-69, and reported that stroke was responsible for 211,390 deaths in that time and estimated that 1,600,000 persons in the United States are afflicted by stroke. This represents eight survivors out of every ten who experience a CVA. Most persons who have experienced a CVA live for many years afterward with differing amounts of disability.

The nutritional intake of those patients who have had strokes may be hampered because of their difficulties in feeding themselves due to paralysis or lack of coordination.
of the hand and arm, especially if the dominant arm is affected. The nutritional status of these patients may become deficient causing fatigue, anemia, decubitus ulcers, and other conditions which delay recovery and limit the patient's ability to participate in the rehabilitation program. "Malnutrition and secondary anemias produce weakness which in turn causes dependency" (Krusen, Kottke, and Ellwood, 1971, p. 537). An adequate diet should contribute to electrolyte balance and prevention of constipation, which are frequent afflictions of CVA victims. The patient's return to health, activity, and self care may depend as much on the patient's nutritional care as on other factors in his medical and nursing treatment programs.

Purpose of the Study

The purpose of the study was to investigate how the CVA patient's intake of nutrients is affected by self-feeding as compared to being fed by others.

Hypotheses

The hypotheses of this study were:

1. Patients with CVAs who have independence in feeding themselves achieve a more adequate nutrient intake than those who are dependent on others feeding them, as determined by a three-day measurement of food intake.
2. Self-fed CVA patients who are affected on the non-dominant side have a higher nutrient intake than those affected on the dominant side.

Theoretical Framework

Food is one of man's basic needs. From his food come energy to carry on activities, materials for the growth and repair of tissue, and components for an optimal internal environment. The human body has very limited ability to store most nutrients. Adequate replacement is necessary for the promotion of health. If the diet is lacking in one or more nutrients, deficiency diseases and/or tissue breakdown will occur.

In this culture feeding is an activity that a person does for himself. Even the infant is taught to feed himself as soon as he is able. Requiring assistance in feeding puts an adult in a dependent role and this could be damaging to self-esteem and to his desire for food.

Dependency can foster progressively increasing dependency and loss of self-esteem. In reference to eating and other activities which fulfill basic needs, Kottke (1965) said that "restriction of activity results in progressive loss of interest" (p. 446). Activity can stimulate increasing interest and response in the patient. The principle of "deterioration from disuse" (Kottke, 1965) is applicable to this study in both the function of voluntary muscles and the
desire for independence which will atrophy if not stimulated and used.

Limitations

1. Food intake was measured for a three-day period and may not have been an accurate indication of food consumption over a longer period of time.

2. The size of the sample is small.

3. Patients in the sample varied in amount of disability.

4. No research or literature was found stating the altered amounts of nutrients required by the patient following a CVA.

5. This study analyzed only protein, fat, carbohydrates, calcium, iron, ascorbic acid, and calories. Other vitamins and minerals are essential to bodily functions but were beyond the scope of this study.

Assumptions

1. The individual's nutritional history and metabolic state are influential in determining the amounts of nutrients needed. In addition to an inadequate intake, interference with digestion, malabsorption or inability to utilize a nutrient leads to deficiencies.

2. Desirable intake provides adequate nutrients and calories to meet, but not exceed, bodily needs.
3. Ingestion of the Food and Nutrition Board's Recommended Dietary Allowance (RDA) will provide adequate nutrients for well persons. Nutritional needs are increased during illness, but standards are not available indicating specific amounts.

4. The RDA caloric allowances can be adjusted to the age, weight, and activity level of persons in the sample.

5. Oral ingestion of food is the most natural and desirable method of obtaining nutrients.

6. Each patient in the study had the capability of feeding himself.

7. Independence in activities of daily living, to the maximum of the patient's ability, is desirable.

8. The patient's appetite may be altered due to several factors of which the following are identified:
   a. Patients were not in their normal environment.
   b. Food was prepared and served by the institution with little flexibility for individual food preferences.
   c. Psychological reactions to illness can be manifested as changed reactions to food and eating.
   d. Changes in physiological functioning are associated with symptoms which may decrease hunger.
9. Nursing care and nutritional adequacy of meals was comparable in the three hospitals participating in this study.

**Definitions**

As used in this study, the following terms are defined:

1. **CVA patient**: a person who has experienced a cerebrovascular accident (CVA) one to four weeks previously and has some residual effect limiting his use of one upper extremity.

2. **Dominant side**: that half of the body which includes the hand the person uses for activities such as eating and writing, the right side of the body for a right-handed person.

3. **Patient who feeds himself**: the CVA patient who may receive assistance in cutting of food and opening of containers, but goes through the feeding motions himself.

4. **Patient who is fed**: the patient whose food intake depends on being fed by others such as staff members, family members, or volunteers.

5. **Nutrient**: a substance contained in food which provides an essential element or compound to the body.

6. **Desirable intake**: ingestion of food containing at least minimal amounts of the RDA for nutrients.
7. **Dependency**: Reliance on others to fulfill one's needs.
CHAPTER 2

REVIEW OF LITERATURE

This chapter contains a review of literature related to the history of the science of nutrition, the value of specific nutrients, stroke, dependency, and rehabilitation.

History of the Science of Nutrition

The scientific study of food values is very recent. Only during the twentieth century has food been analyzed and research been conducted to learn how specific nutrients in food are metabolized to support and maintain life (Mitchell et al., 1968). In 1940 the Food and Nutrition Board was established as a subdivision of the National Research Council. Its purposes were to promote needed research and to interpret nutritional science in the interest of public welfare (Food and Nutrition Board, National Research Council, 1968, Introduction).

In 1943 the Board published its first data on Recommended Daily Allowances (RDA). As new knowledge became available, several revisions were made; the most recent was published in 1968. The RDA is a goal for diet planning and a guideline for food consumption with allowances designed to afford a margin sufficiently above average physiological requirements among practically
all individuals in the general population . . . but they are not necessarily adequate to meet the additional requirements of persons depleted by disease, traumatic stresses, or poor dietary inadequacies (Food and Nutrition Board, National Research Council, 1968, Introduction).

A copy of their recommendations is presented in Appendix D.

**Diet Studies**

A diet may be carefully planned to include needed nutrients but, if the food is not eaten, it cannot be used for the body's needs. Diet studies are done to determine the actual food intake.

Evans and Stork (1971) did a diet study on 39 elderly patients and reached the following conclusions:

Contrary to expectation, the long-term chronically ill patients who required the most nursing care and help with feeding had the highest intake. Patients who were capable and therefore allowed to feed themselves made the poorest choices of food and consumed the least (p. 21).

The differences were attributed by Evans and Stork to the fact that the ward staff made the choices of food for those whom they fed and chose more nutritious foods.

No study was found which measured intake between self-fed and staff-fed groups where all subjects were given similar meals.

On the assumption that "with a low caloric intake it is very likely that serious individual nutrient deficiencies of the food intake may occur" (Bergstrom and Lundberg, 1969, p. 177), the diets of a group of handicapped adolescents were
studied. These children all had difficulty feeding themselves. Caloric intake ranged from 50 to 81 percent of the amount recommended for healthy young people, and up to 50 percent of these calories were from products with a high sugar content. All groups had a low intake of calcium, iron, fat, and protein.

Patrick (1972) studied nursing care given to hemiplegic patients and reported feeding methods conflicted with those recommended in nursing textbooks. She observed that patients were not encouraged to feed themselves even if able, but were fed hastily by the staff. Spices and seasonings were used without asking the patient his preference, and selective menus were filled out without considering the patient's likes and dislikes.

Many studies of geriatric patients' diets have found food intake inadequate. Henrikson (1970) used a U.S. Department of Agriculture rating scale based on consumption of percentages of the RDA and found no patient in her sample of 24 patients achieved a "good" intake, while 29 percent were rated "fair," and 71 percent were "poor."

Literature related to nutritional therapy (Williams, 1969; Mitchell et al., 1968) and CVA management (Conn, 1972; Rusk, 1971; Herschberg, 1964; Krusen et al., 1971) made no reference to the need for a special diet for patients who experienced a CVA. One nursing study of CVA patients in a Stroke Intensive Care Unit (Shaw, 1970, p. 59) reported that
most of their patients were low in total proteins. They are given a regular diet with increased protein, 100 grams per day.

Value of Specific Nutrients

Carbohydrates provide the most usable form of heat and energy to the body. The amount stored is relatively small so carbohydrates must be ingested regularly at moderately frequent intervals. "A constant amount of carbohydrate is necessary for the proper functioning of the central nervous system" (Williams, 1969, p. 15) because neurons in the brain do not store glucose, the form into which carbohydrates are broken down by digestion. The RDA recommended at least 100 grams of carbohydrates per day to avoid the breaking down of tissue proteins to meet energy needs (Food and Nutrition Board, National Research Council, 1968, p. 10).

Fats (lipids) supply a more concentrated form of energy and excess amounts are stored. Layers of fat provide padding for nerves and organs. The relationship of dietary fat to atherosclerosis and coronary heart disease has been studied, though controversy still exists. Elevated plasma levels of cholesterol and triglycerides, forms of lipid substances are significant risk factors in the occurrence of angina pectoris and myocardial infarction. . . . The mechanism by which diets rich in polyunsaturated fatty acids lower plasma cholesterol is not well understood. Moreover, the effect of such dietary changes
on the course of human atherosclerosis remains undetermined (Food and Nutrition Board, National Research Council, 1968, pp. 11-12).

For these reasons the Food and Nutrition Board made no recommendation for fat intake. "An adequate intake of fat is about 25 percent of the total calories. . . . However, there is no basis for agreement on the required level of fat" (Williams, 1969, p. 28).

The primary function of protein is the growth and maintenance of tissue; such synthesizing of protein is anabolism. Catabolism is the breaking down of tissues, the products being oxidized or excreted. If the rate of catabolism is greater than synthesis, the body deteriorates. When a person is confined to bed, "anabolic processes are retarded and catabolic activities are accelerated" (Olson, 1967, p. 793).

Nitrogen balance is the net result of nitrogen losses and gains in the body's protein compartments. A negative nitrogen balance implies greater protein utilization than protein intake and is present in malnutrition, debilitating diseases, and in the presence of glucocorticoid hormones (Guyton, 1971, p. 846). Clinically, this can be seen as weight loss, delayed healing, and decubitus ulcers, as well as decreased resistance to infection and reduction of hemoglobin and plasma proteins.

Krause (1966) stated that "any physical illness increases protein breakdown in the body. Indeed, merely
staying in bed for several days will put a person in negative nitrogen balance" (p. 11). Kottke's (1965) studies indicated that "immobilization produces a disturbance of metabolic balances" (p. 445). Calcium and other electrolytes, as well as nitrogen, went into a negative balance when a patient was confined to bed. He recommended "prevention of metabolic imbalances requires mobilization of the patient" with activities such as feeding begun as quickly as possible to stimulate metabolism to restore normal balance.

As activity resumes, anabolic processes return. Yet, "all the necessary amino acids [the digested form of proteins] for a given protein must be present at the same time or a given protein will not be formed" (Williams, 1969, p. 51). Thus, in order for new tissue growth, the essential amino acids must be supplied by the diet by "proteins of high nutritional quality, such as those of egg, meat, and milk" (Food and Nutrition Board, National Research Council, 1968, p. 17). Sixty-five grams per day were recommended.

"The average American receives approximately 15 percent of his energy from protein, about 40 percent from fat, and 45 percent from carbohydrates," reported Guyton (1971, p. 844). The Recommended Dietary Allowances made calorie allowances on the basis of reference subjects, male and female, ages 22. Adjustments were then made based on age, activity, weight, and environmental temperatures.
Food supplies the body with other essential substances. Inorganic elements, trace minerals, are required for metabolic activities. The value of iron and calcium will be discussed; sodium, potassium, phosphorus, magnesium, and others are also required.

Iron is used in the enzyme systems of cells for oxidation of glucose to produce energy and in the formation of hemoglobin, a part of the red blood cells which transports oxygen to the cells. A lack of iron causes symptoms of weakness, palor, headache, and fatigue resulting from oxygen deprivation. A daily intake of 10 mg. is recommended for men and for women past childbearing age.

The values of certain foods are emphasized. Milk, custard, cocoa, and puddings are associated with the dependency of early childhood, and "because of the sense of security they convey, others [patients] may cling to using these same foods . . . . Some adults will refuse such foods despite their nutritional value because they resent the dependency of illness" (Mitchell et al., 1968, p. 259). These foods are a primary source of calcium. While excess calcium may contribute to urinary tract stones, an adequate intake is required because calcium salts are mobilized from the bones of patients who are bedridden for long periods (Herschberg, 1964, pp. 38-40). The demineralized bones are susceptible to fracture when the patient begins increased activity and walking. When a person is immobilized, "dietary calcium
intake should be adequate but should not exceed the usual daily allowance" (Williams, 1969, p. 123). The RDA for calcium for an adult is 800 milligrams (mg.).

Organic compounds which cannot be manufactured by the body, yet are necessary for metabolic functions, are called vitamins and are divided into fat-soluble and water-soluble groups. The body has the capability to store fat-soluble vitamins, except Vitamin K. Examples are Vitamins A and D, which can be stored for six and five months, respectively (Guyton, 1971, p. 852).

Water-soluble Vitamin C (ascorbic acid) is stored only in slight amounts, and lack of this vitamin in the diet can cause symptoms within a few weeks (Guyton, 1971, p. 852). These include small hemorrhages due to capillary fragility, slow healing of injured tissues, loosening of gums, and oral infections. The principal use of Vitamin C is for the maintenance of intracellular substances; a secondary use is making iron available for hemoglobin. "Any body stress . . . calls on Vitamin C stores" (Williams, 1969, p. 112). Therefore, replacement of Vitamin C assumes importance to the patient's recovery with 60 mg. daily providing optimal margins to cover variations in tissue demand (Williams, 1969, p. 112).

The Vitamin B-complex, which is made up of twelve vitamins and vitamin-related factors, is also water-soluble. Their functions include acting as co-enzymes, factors promoting cell growth, and blood-forming factors, preventing
deficiency diseases, maintaining tissue respiration (Williams, 1969, p. 89). Meats and eggs are good sources of the B vitamins, and enrichment laws in the United States provide for the addition of thiamine (B₁), riboflavin (B₂), and niacin (B₃) to flour and cereal products.

**Stroke**

According to the American Heart Association (1972) "a stroke or 'cerebrovascular accident' occurs when the blood supply to a part of the brain is occluded, depriving the nerve cells in that area of the blood they need to function" (p. 5). The artery may become plugged as a result of a blood clot which has formed in it (cerebral thrombosis) or one which has formed elsewhere, becomes dislodged and then wedged in the artery (cerebral embolism). If the blood vessel ruptures (cerebral hemorrhage), nerve cells are also deprived of the oxygen and nutrients they receive from blood and will die.

The effects and severity of a stroke depend on the area of the brain affected, the number of neurons damaged, and the effectiveness of the body in re-establishing a blood supply and retraining other neurons to resume the lost functions. Some patients do not survive the attack; others recover with no residual effects.

In still others varying degrees of functional impairment remain, producing disability that ranges from total, bedridden, incontinent dependency to almost
complete self-sufficiency, with residual difficulties in the use of the involved upper extremity or in standing and ambulation (Levenson, in Krusen et al., 1971, p. 521).

Hemiplegia is the loss of some degree of function of the right or left side of the body and is a common effect of a stroke. The resulting paralysis, either partial or complete, interferes with the patient's ability to carry out functions of daily living.

**Dependency**

The person who is normally independent and functioning well in society faces many emotional problems when he becomes ill and dependent, especially if the change is sudden as with a CVA. Adult patients react in several different ways to illness and to the role of dependency. Hofling, Leninger, and Bregg (1967, p. 37) described feelings ranging from relief and escape from responsibility to loss of self-esteem and belief that illness is a personal affront to one's strength. He may exhibit regressive behavior. One child-like behavior mentioned was refusal to eat (Schwartz and Schwartz, 1972, p. 391).

McClain (Tucson Daily Citizen, 1972) observed depression, rebellion, and anger among elderly people who could not care for themselves. She said

Such emotions are common among the institutionalized elderly, especially when first deprived of independence. It is a rude and abrupt adjustment for
anyone, any age to make. The reaction often is to withdraw and, if allowed to waste away (p. 29).

Peplau (1952, pp. 182-183) described a case of a hemiplegic woman who resented dependency. However, she accepted another type of relationship in which the nurse worked with her to design interesting activities which would improve hand and arm function. The patient responded to the nurse's interest, support, and to her cues that the patient could take care of herself again.

Rehabilitation

Rusk (1971) said the purpose of rehabilitation of a hemiplegic patient is to teach and retrain the individual so that he will re-acquire and re-learn previously established skill. Rehabilitation is aimed toward giving him "an opportunity to lead as fulfilling and self-sufficient life as his physical, emotional, and socioeconomic resources permit" (Krusen et al., 1971, p. 522). The hemiplegic patient "performs during this relearning process in a pattern that is directly related to the extent of the disability" (Rusk, 1971, p. 610). Stern (in Conn, 1972) said that "stroke rehabilitation should begin as early as possible after a stroke" (p. 646). The President's Commission on Heart Disease, Cancer, and Stroke (1964) discussed rehabilitation programs, and stated that, "if started early enough and carried through [the program], can make the difference between total dependency and self-sufficiency" (p. 14).
However, poor motivation, depression, disturbed spatial perception, and loss of motor function may interfere with his active involvement in rehabilitation (Rusk, 1971, pp. 610-611). By offering to help at this time and by taking over a function for the patient, is his dependency prolonged? Menninger's viewpoint (Garrett, 1953) was that the physically disabled "must be encouraged to accept some degree of dependency" (p. 13). That degree is proportionate to the "severity of the disability and the patient's resources for developing new skills" (p. 20). The importance of managing dependency needs was pointed out by Rusk (1971, p. 267) when he said rehabilitation goals are often in direct contradiction to manifestations of dependency and that the outcome of rehabilitation may rest on management of dependency needs.

Among the activities of daily living taught by rehabilitation programs is self-feeding. During the acute phase of a stroke, patients are usually fed by staff and a dependent, poorly motivated patient will want this method to be continued. Rusk (1971) recommended that "training in self-feeding should be undertaken at the bedside as soon as the patient is alert and responsive" (p. 615). Stanton (1969) suggested "participation by the patient in holding or assisting so that his interest in self-care starts early" (p. 45).
In his remarks about preventing further loss of function and rehabilitation of the disabled, Kottke (1965) said

Efficient rehabilitation of the severely disabled patient is possible only if deterioration is prevented and the patient's abilities are preserved. . . . Intelligent use of activity to maintain the abilities of the unaffected parts of the body together with adequate protection for the involved parts of the body will increase the time required for the restoration of the patient to maximum usefulness (p. 447).

This principle applies to a patient's use of muscles to feed himself. If the affected arm has some function remaining, movement should prevent deterioration and atrophy. The patient can be trained to use his non-affected extremity. This presents a greater challenge if the dominant side is paralyzed.

Newton, Beal, and Strauss (1967) studied the nutritional aspects of nursing care on the premise that "a significant element of patient care is focused around nutritional needs" (p. 46). Yet they found that "for the staff or bedside nurse, nutrition has a low priority" (p. 49). Nurses have a great responsibility in meeting emotional and physical needs in this area, as Mitchell et al. (1968) emphasized when they wrote,

Assessing the ability of any handicapped individual and providing the proper assistance not only will reduce his frustrations, but also may help him to achieve a reasonable nutrient intake (p. 261).
Implications of the importance of the nurse's role were seen in the Evans and Stork (1971) study which found that intervention of the nursing staff in the choice of food was responsible for an increased nutrient consumption by a group of geriatric patients.
CHAPTER 3

METHODOLOGY

This chapter presents the criteria set for inclusion in the population of the study. Research design, instruments used, and the methods of collecting and analyzing data are outlined.

The Population and the Sample

Patients from three hospitals in a city in the Southwestern United States who had experienced a cerebrovascular accident (CVA) one to four weeks prior to the periods of data collection comprised the population of this study. There were no restrictions as to sex, age, or previous CVA. Other criteria for inclusion in this study were that patients had to be receiving foods orally and be receiving a diet providing adequate nutrients to supply the RDA. Residual hemiplegia of an upper extremity had to be present and the researcher ascertained whether the dominant or non-dominant side was involved.

Patients were assigned to Group I if they were being fed by the nursing staff or family members and to Group II if they fed themselves. The groups were then subdivided into hemiplegia of the dominant or non-dominant side. A sample of
five to seven patients in each of the four groups was expected.

Reasons for exclusion of CVA patients from the sample were these:

1. CVA had occurred more recently than one week or longer than four weeks prior to the study.
2. The patient had no residual hemiplegia.
3. The diet ordered was deficient in one or more nutrients.
4. The feedings were given via nasogastric tube.
5. Patients were comatose and therefore not eating.

Research Design

When a patient was found to meet the criteria for inclusion in the study, the researcher, a registered nurse engaged in graduate studies, held a discussion with the head nurse and team leader responsible for his care. The purpose and method of the study were explained. For patients in Group I, those already being fed by the staff, the researcher requested that this method be continued, allowing the staff member who was normally assigned to his care to feed him. If a family member or volunteer requested to feed him, this also would be allowed. The whole feeding process was to be performed by the feeder.

Patients in Group II were those who fed themselves. Assistance was allowed in opening food containers, cutting
meat or other solid food, and adding sugar and/or spices to food. The patient was then allowed to use fingers or utensils to put the food in his mouth by himself. The staff was asked to return spilled solid food to the tray and estimate liquid spillage as accurately as possible.

If the patient received supplemental feeding, these were consumed in the same manner as the meals and entered on data sheets. After the evening meal the researcher was not at the hospital and the staff on the unit recorded additional feeding. Each patient's intake was evaluated over the 24-hour period for three consecutive days.

Upon determination of the amounts of food actually consumed, the content of calories, carbohydrate, fat, protein, iron, calcium, and Vitamin C were determined. References used in determining these amounts were: Composition of Foods: Raw, Processed, Prepared (U.S. Superintendent of Documents, 1963), Nutritive Value of Foods (U.S. Superintendent of Documents, 1970), and Food Values of Portions Commonly Used (Church and Church, 1970).

Caloric requirements were based on the age, weight, and activity of the patient. However, when the diet order included a specified number of calories, this was used as the amount representing optimal caloric intake. The RDA assumes light activity, which is defined by the Food and Nutrition Board, National Research Council (1968) as being more than sedentary, yet not vigorous, heavy work. Hospitalized
patients were not expected to be engaged in heavy work, so the caloric allowances based on age, light activity, and weight were used for all patients who were ambulatory or up in a chair for periods longer than three hours per day. The three hour period was chosen because patients who are up for shorter periods are usually up for meals only.

For patients confined to bed or who were up in a chair or wheelchair less than three hours daily, their resting metabolic rate (RMR) was estimated. This represents the metabolism in a situation of rest and includes energy requirements needed in a state of wakefulness without exercise and for the metabolism of food. The RMR is based on the ideal weight and age of the patient and declines two percent per decade. The RMR of the inactive patient was calculated by determining his ideal weight and reducing, by two percent per decade, the RMR of the Food and Nutrition Board's reference person of age 22 years (Food and Nutrition Board, National Research Council, 1968, pp. 3-5).

The RDA of the Food and Nutrition Board, National Research Council, 1968 revision (see Appendix D) was used to determine optimal value of other nutrients being measured. These were carbohydrate, protein, iron, calcium, and Vitamin C.

Patients were weighed one day prior to the study, during the time of data collection, and on the day following
the study. The purpose was to note whether a trend toward weight gain or loss was noted for the patients as a group.

Each patient had the right to refuse to participate in the study. Written consent was obtained from the patients in the participating government hospital as required. Patients in other hospitals consented orally to participate. All patients in the study remained anonymous.

Participation in the study did not alter medical or nursing care received, nor were the patients' diet orders changed in any way. No attempt was made by the researcher or staff to modify the patients' food intake. Food was served according to the ward's usual routine. Nothing was added to or removed from the food prepared and served in the kitchen. The role of the researcher was that of observer. She did not participate in the serving of meals or feeding of patients so as to avoid experimental bias.

**The Instruments**

Three instruments were developed by the researcher for use during the collection of data. A personal data sheet, Appendix A, was used to record historical information about the patient. This included date of the CVA, food allergies, medications, diet order, activity levels, and recent lab tests.

Another instrument (see Appendix B) provided for the recording of all foods consumed during each 24-hour period.
This sheet was divided into separate columns for each meal with additional space for supplemental feedings. A provision was made for indicating who did the actual feeding—the patient himself, a nursing staff member, a family member, or others. A copy of this tool was left at the patient's bedside each day and the nursing staff members were asked to record type and amount of foods eaten. Data of most importance were the method of feeding, between-meal nourishments, and fluids actually drunk in cases of liquid spillage.

Foods served at each meal and the weight in grams of the serving were recorded by the researcher on another data sheet (see Appendix C). Food not actually eaten was weighed and subtracted from the weight served to determine food actually ingested. Additional columns were used for recording of the content of each nutrient being studied in the amount of each food consumed.

Data Collection

A survey was made of charts of patients on the medical units in a United States government hospital by the researcher. Permission to perform the study was sought and obtained from the Research Committee of this hospital. Later, the study was expanded to include patients in two non-profit hospitals. All hospitals were in a city in the Southwestern United States.
The study was carried out in four periods of observation, each of which covered three consecutive days. These periods were in December, 1972, and January and February, 1973.

When a patient was found meeting the criteria for inclusion in the study, his permission was obtained. The head nurse and team leader were told that he would be a participant and the procedure was explained. On each day of the study a copy of the tool, Appendix B, was left at the patient's bedside for use by the nursing staff to record foods eaten.

Information as to what food the patient would receive for a meal was obtained from master lists in the dietary department. The researcher used a gram scale to measure the size of food portions in the hospital's kitchen before food was served to the patient.

After the meal, all food not consumed was placed on the food tray which was collected by the researcher. This remaining food was weighed and subtracted from the weight of the portion served. The remainder represented food actually consumed.

Collection of data was done by the researcher for the intake at morning, noon, and evening meals. Additional intake was recorded on the evening and night shifts by the staff member who served a snack to the patient and observed him eating it.
Reference materials were used to determine the amount of calories, carbohydrate, protein, iron, calcium, and Vitamin C in the amount of each food eaten. Daily totals were made for each of the three days and then the average daily consumption was determined. This was compared to the recommended amount and the percentage of the RDA consumed was calculated.

Analysis of Data

The means of percentage of the RDA of each nutrient was calculated for patients in Group I. The procedure was repeated for Group II. The data for Group I were then compared to those for Group II to determine whether differences in the method of feeding made a difference in intake. Analysis of variance was used to analyze the data. The level of significance was .05.

Groups had been subdivided into patients having hemiplegia on the dominant side and the non-dominant side. Means of nutrient intake of these groups were determined, but the small sizes of the sample precluded statistical analysis.
CHAPTER 4

ANALYSIS OF DATA

This chapter presents a description of patients who made up the sample and analysis of the data obtained.

Characteristics of the Sample

The sample was made up of eighteen patients hospitalized in medical units of the three hospitals cooperating in this study. They comprised the total population of patients who had experienced a CVA one to four weeks prior to the times of data collection, December, 1972, and January, 1973, and who met other criteria for inclusion. The eleven patients in Group II fed themselves. Five of these had residual hemiplegia affecting their dominant side; and six, the non-dominant side. Of the seven staff-fed patients in Group I, three were affected on the dominant side and four on the non-dominant side. Fewer patients than had been anticipated were available who met the criteria of the study during the time available to the researcher for data collection. The eighteen patients in the sample ranged from 45 to 83 years of age, with a mean of 67.0 years. Ten were male and eight were female. In the staff-fed group the mean age was 72.0 years. Four were male and three female. Those in Group II,
self-feeders, had a mean age of 65.6 years. Six were male and five female. These data are presented in Table 1.

<table>
<thead>
<tr>
<th></th>
<th>Age Range</th>
<th>Mean Age</th>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff-Fed</td>
<td>63-83</td>
<td>72.0</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Self-Fed</td>
<td>45-80</td>
<td>65.6</td>
<td>6</td>
<td>5</td>
</tr>
</tbody>
</table>

Three of the staff-fed patients were occasionally fed by a family member. One was fed only by his wife or son.

Seven patients had a regular diet ordered, which meant no food restrictions. Other diets included low-calorie, low-sodium, bland, and soft. The diet order for each patient is presented in Appendix E.

Food allergies were reported by Patient 1, who was allergic to milk, and Patient 18, who was allergic to citrus fruit. No patient received vitamin or mineral supplementation.

The severity of the residual hemiplegia was also dichotomized and classed as either severe or moderate as judged by the amount of voluntary movement. The severely affected had either minimal movement of the fingers on the affected hand or no voluntary movement of the affected extremity. If the patient had at least voluntary movement of the hand, hemiparesis was classed as moderate.
Of the staff-fed patients, four were severely affected, three on the dominant side. One of the three patients with moderate paralysis had the dominant side involved. Of the self-feeders, four were affected to a severe degree, two on the dominant side. Three of the seven with moderate paralysis had involvement on their dominant sides. These data are presented in Table 2.

Table 2. Characteristics of the Sample: Side Paralyzed and Severity

<table>
<thead>
<tr>
<th></th>
<th>Dominant Side</th>
<th>Non-Dominant Side</th>
<th>Severity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff-Fed</td>
<td>3</td>
<td>4</td>
<td>3 4</td>
</tr>
<tr>
<td>Self-Fed</td>
<td>5</td>
<td>6</td>
<td>7 4</td>
</tr>
</tbody>
</table>

Diet Analysis

The weight in grams of each food eaten at each meal during the time of the study was determined. Supplemental feedings were also included. A nutrient analysis was done to determine the intake of calories, carbohydrates, protein, iron, calcium, and Vitamin C (ascorbic acid). Totals of each nutrient for the three-day period were averaged to determine the average daily consumption. Dividing this value by the RDA value for the patient's age yielded the percentage of RDA consumed by the patient. The percentages of the RDA of the
six selected indices, based on the average daily consumption during the three day observation period, are presented in Appendix E.

Caloric recommendations of the RDA were used for nine patients. Diet orders specified the number of calories desired for four patients and this figure represented their optimal caloric intake. For five other patients, an additional calculation to determine the resting metabolic rate was necessary because they had a low level of activity. This calculation is demonstrated in Appendix F.

The percentage of RDA intake for calories ranged from 11 to 122 percent. Carbohydrate intake ranged from 29 to 318 percent. The range for protein consumption was 7 to 213 percent. Iron intake ranged from 10 to 231 percent, calcium from 9 to 155 percent, and Vitamin C from 32 to 277 percent. One patient in the staff-fed group had the lowest scores for calories, protein, iron, and calcium intake. One patient in the self-fed group obtained the highest percentages of consumption of calories, protein, and iron. The ranges of the intake of the staff-fed and self-fed groups, expressed as a percentage of the RDA, are presented in Table 3.

The mean intake of each group for the selected nutrients was determined for Group I and Group II. Group I, staff-fed, achieved 100 percent of the RDA only for Vitamin C; 111.7 percent was the group mean. The group mean failed to reach the recommended amounts for other nutrients.
Table 3. Range of Groups’ Intake of Nutrients, Expressed as a Percentage of the RDA

<table>
<thead>
<tr>
<th></th>
<th>Calorie</th>
<th>CHO</th>
<th>Protein</th>
<th>Iron</th>
<th>Calcium</th>
<th>Vitamin C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Staff-fed (1)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominant</td>
<td>15-78</td>
<td>29-128</td>
<td>19-95</td>
<td>21-84</td>
<td>72-93</td>
<td>63-184</td>
</tr>
<tr>
<td>Non-dominant</td>
<td>11-64</td>
<td>34-137</td>
<td>7-93</td>
<td>10-77</td>
<td>9-123</td>
<td>88-141</td>
</tr>
<tr>
<td><strong>Self-fed (11)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominant</td>
<td>30-125</td>
<td>105-236</td>
<td>41-213</td>
<td>83-231</td>
<td>30-155</td>
<td>105-277</td>
</tr>
<tr>
<td>Non-dominant</td>
<td>66-122</td>
<td>73-318</td>
<td>53-138</td>
<td>26-130</td>
<td>66-155</td>
<td>32-194</td>
</tr>
</tbody>
</table>

Caloric intake was lowest, 47.4 percent. Other percentages were carbohydrate, 81.3 percent; protein, 58.6 percent; iron, 50.4 percent; and calcium, 58.9 percent.

Self-fed patients achieved the recommended amounts for four nutrients. The highest percentage was for carbohydrate, 168.1 percent. Other nutrients were Vitamin C, 156.5 percent; protein, 119.1 percent; and iron, 114.8 percent. Mean intake was lowest for calories, 85.5 percent. The percentage for calcium was 98.7. These data are presented in Table 4.
To aid in visualizing the amount of intake of each nutrient by the staff-fed and self-fed patients, a scattergraph was made, which is presented in Table 5.

A computerized analysis of variance using the F-test for comparison of means was performed between the groups. Each nutrient was analyzed to determine if a statistically significant difference, at the .05 level, existed between means. Data are presented in Table 6.

These data revealed that a statistically significant difference does exist between the groups at the .01 level for caloric intake and consumption of carbohydrate and protein, with protein having the most significant difference. The difference between groups is significant for iron and for calcium at the .05 level. There is not a significant difference for Vitamin C; however, it is interesting to note that the mean of both groups exceeded the RDA for Vitamin C.
Table 5. Scattergraph of Percentage of RDA of Six Nutrients Achieved by Self-fed and Staff-fed Patients

<table>
<thead>
<tr>
<th>Percentage of Calories</th>
<th>Carbohydrate</th>
<th>Protein</th>
<th>Iron</th>
<th>Calcium</th>
<th>Vitamin C</th>
</tr>
</thead>
<tbody>
<tr>
<td>310-319</td>
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<tr>
<td>300-309</td>
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<td>290-299</td>
<td></td>
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<td>280-289</td>
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<td>270-279</td>
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<tr>
<td>260-269</td>
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<tr>
<td>250-259</td>
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<td>240-249</td>
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<tr>
<td>230-239</td>
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<td>*</td>
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<tr>
<td>220-229</td>
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<td>210-219</td>
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<tr>
<td>200-209</td>
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<td>190-199</td>
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<td>180-189</td>
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<td>170-179</td>
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<tr>
<td>160-169</td>
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<td>150-159</td>
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<tr>
<td>140-149</td>
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<tr>
<td>130-139</td>
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<tr>
<td>120-129</td>
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<tr>
<td>110-119</td>
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<td>100-109</td>
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<td>90-99</td>
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<td>80-89</td>
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<td>70-79</td>
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<td>60-69</td>
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<td>40-49</td>
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<tr>
<td>30-39</td>
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<td>20-29</td>
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<tr>
<td>10-19</td>
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<tr>
<td>0-9</td>
<td></td>
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</tr>
</tbody>
</table>

* = self-fed.

. = staff-fed.
Table 6. Analyses of Variance Between Groups for Calories, Carbohydrate, Protein, Iron, Calcium, and Vitamin C

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Mean Square</th>
<th>Degrees of Freedom</th>
<th>F-Ratio</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories:</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Total</td>
<td>1114.57</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>6215.17</td>
<td>1</td>
<td>7.81</td>
<td>.01</td>
</tr>
<tr>
<td>Within Groups</td>
<td>795.78</td>
<td>16</td>
<td></td>
<td></td>
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<tr>
<td>Carbohydrate:</td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>5649.41</td>
<td>17</td>
<td></td>
<td></td>
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<tr>
<td>Between Groups</td>
<td>32233.66</td>
<td>1</td>
<td>8.08</td>
<td>.01</td>
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<tr>
<td>Within Groups</td>
<td>3987.90</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protein:</td>
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<tr>
<td>Total</td>
<td>2702.38</td>
<td>17</td>
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<tr>
<td>Between Groups</td>
<td>15667.82</td>
<td>1</td>
<td>8.28</td>
<td>.01</td>
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<tr>
<td>Within Groups</td>
<td>1892.04</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron:</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4431.48</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>17735.76</td>
<td>1</td>
<td>4.93</td>
<td>.04</td>
</tr>
<tr>
<td>Within Groups</td>
<td>3599.96</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium:</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Total</td>
<td>1781.95</td>
<td>17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>6800.07</td>
<td>1</td>
<td>4.63</td>
<td>.04</td>
</tr>
<tr>
<td>Within Groups</td>
<td>1468.31</td>
<td>16</td>
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<tr>
<td>Vitamin C:</td>
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</tr>
<tr>
<td>Total</td>
<td>4796.58</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>8597.62</td>
<td>1</td>
<td>1.89</td>
<td>.19</td>
</tr>
<tr>
<td>Within Groups</td>
<td>4559.01</td>
<td>16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The self-fed and staff-fed groups had been subdivided to consider the effect on intake of hemiplegia of the dominant and non-dominant side. The size of the groups was small and precluded making statistical conclusions about this effect. The mean percentage of RDA consumed of each nutrient was determined for each of the four groups and is presented in Table 7.

Table 7. Group Means for Percentage of RDA of Nutrient Intake Based on Feeding Method and Side Paralyzed

<table>
<thead>
<tr>
<th></th>
<th>Calorie</th>
<th>Carbohydrate</th>
<th>Protein</th>
<th>Iron</th>
<th>Calcium</th>
<th>Vitamin C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Staff-fed:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominant side</td>
<td>51.7</td>
<td>81.7</td>
<td>59.7</td>
<td>79.8</td>
<td>54.5</td>
<td>115.3</td>
</tr>
<tr>
<td>Non-dominant side</td>
<td>41.7</td>
<td>80.7</td>
<td>57.0</td>
<td>39.7</td>
<td>64.7</td>
<td>107.0</td>
</tr>
<tr>
<td><strong>Self-fed:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dominant side</td>
<td>90.0</td>
<td>203.2</td>
<td>130.4</td>
<td>156.8</td>
<td>88.2</td>
<td>192.8</td>
</tr>
<tr>
<td>Non-dominant side</td>
<td>81.8</td>
<td>138.8</td>
<td>109.7</td>
<td>58.5</td>
<td>107.5</td>
<td>126.3</td>
</tr>
</tbody>
</table>
The second hypothesis of the study was: Self-fed patients who are affected on the non-dominant side have a higher nutrient intake than those affected on the dominant side. Data led to rejection of this hypothesis for all nutrients except calcium. For all other nutrients intake of the patients with dominant side hemiplegia was higher than non-dominant affectation, regardless of the feeding method.

Examination of each individual's dietary pattern showed that one could exceed the RDA value for some nutrients and be deficient in others. Frequently a patient's intake concentrated on one particular food or group of foods, either from his own choice or because these are the foods given to him by the staff at meals and as snacks. The appetite may become saturated by these foods leading to an exclusion of other foods. As a result of this lack of a well-balanced diet, limited amounts of some nutrients are obtained. In Figure 1 a graph of the intake of two patients, 7 and 11, who had a strong preference for milk and dairy products, is presented. These contain high amounts of calcium and protein. Exclusion of meat and eggs is reflected in the low iron intake.

Two other patients received large amounts of orange juice, which provides high amounts of Vitamin C and carbohydrate, but they consumed few dairy products. Patient 18 ate very little other food and this is reflected in low values for protein, iron, calcium, and total calories. Patient 10
Figure 1. Percentage of RDA Achieved by Two Patients Having Unbalanced Diets Due to Emphasis on Dairy Products and Low Intake of Meat and Eggs
ate most of the meats and vegetables served to her. Her protein intake is adequate and iron intake is relatively high. She used no butter, cream, or other foods high in fat, so even though she achieved 129 percent of the carbohydrate recommended, she did not meet her total caloric needs. A graph of the intake of these two patients is presented in Figure 2.

Three patients gained weight ranging from one-half to 3-1/4 pound, with a mean gain of 1-1/2 pounds. Thirteen patients lost weight in amounts ranging from one-fourth to 11 pounds. Mean loss was 3-3/4 pounds. The patient who lost 11 pounds was on a reducing diet of 1000 calories per day and his caloric intake was only 640 calories, 64 percent of this amount. Two patients had no change in weight.

Three patients were taking diuretic medications to promote urinary excretion of excess fluid from the body. One of these patients gained one-half pound, one gained three-fourths pound, and one lost one-half pound.

**Summary**

This chapter has presented the characteristics of patients who made up the sample and the nutritional adequacy of their food consumption. Data have been introduced which were pertinent to the differences in the mean intake between staff-fed and self-fed groups and between those members of
Figure 2. Percentage of RDA Achieved by Two Patients Having Unbalanced Diets Due to Emphasis on Orange Juice and Low Intake of Dairy Products
the groups affected on the dominant side and non-dominant side.
CONCLUSIONS OF THE STUDY

The purposes of the study were to determine whether the hospitalized CVA patient with residual hemiplegia consumes nutrients in amounts recommended by the National Research Council, whether the intake of the patient who feeds himself is better than that of the staff-fed patient, and whether the patients with hemiplegia of their non-dominant side achieve a higher intake than those affected on the dominant side. Interpretation of the data and recommendations for further research will be presented in this chapter.

Interpretation of the Findings

When evaluating each individual's intake of all six selected nutrients, only four obtained 100 percent of each item. Each of these patients fed himself. Three subjects were paralyzed to a moderate degree, two on the dominant side. The fourth patient was severely paralyzed on his dominant side. Three were on regular diets, the other on a 1200-calorie diet. Each of these patients participated in choosing his foods.

One self-fed patient, moderately paralyzed on his non-dominant side, achieved greater than 80 percent of the
RDA for all nutrients. He chose his foods from among the choices on his low-sodium diet.

Another patient achieved an intake above 75 percent for all nutrients except Vitamin C. This patient disliked orange juice. She was also self-fed and had moderate paralysis of her non-dominant side. Her diet order was for soft food with pureed fruits and vegetables, and she did participate in choice of foods.

One staff-fed patient, severely affected on her dominant side, achieved at least 70 percent intake of all nutrients except iron, which was 66 percent. She had a soft, pureed diet order and did not choose her foods.

No other patient achieved above two-thirds of the RDA for all nutrients. Therefore, the conclusion is that the majority of patients had consumed inadequate amounts of nutrients.

Data showed that Vitamin C was the only nutrient for which the mean intake of both self-fed and staff-fed groups met and exceeded 100 percent of the RDA. Both groups had low mean consumption of calories with the staff-fed group achieving only 47 percent of the RDA and self-feeders, 85 percent.

The difference between groups' means for Vitamin C intake was not significant at the .05 level of significance. All other nutrients did show a statistically significant difference, at the .05 level or higher, between the two groups.
Based on these findings, the null hypothesis of no significant difference between groups is rejected for calorie, carbohydrate, protein, calcium, and iron intake. For these nutrients, Hypothesis 1 is accepted. The CVA patients who had independence in feeding themselves did achieve a statistically significant better intake.

The null hypothesis of no significant difference between groups for intake of Vitamin C is accepted. Both groups achieved a similar intake of Vitamin C.

Examination of the intake of patients, on basis of paralysis of their dominant or non-dominant side, resulted in an unexpected finding. The mean intake of nutrients of both staff-fed and self-fed patients was higher for those affected on their dominant side for all nutrients except calcium. Calcium intake was higher for those affected on the non-dominant side. Statistical analysis was not done to determine the probability of these findings because the size of the groups was small.

The second hypothesis of the study was that the nutrient intake of those affected on the non-dominant side would be higher than the intake of those affected on the dominant side. This hypothesis was rejected for all nutrients except calcium.
Pertinent Observations

The means of the group do not reflect an individual's variations among nutrients in achieving the RDA. Those with strong food preferences, e.g., milk or orange juice, tended to eat more of these products and exclude other foods. Their diets were unbalanced and deficient in nutrients contained in the excluded foods, as shown in Figures 1 and 2.

Another observation pertinent to the study was that none of the eighteen patients received vitamin or mineral supplementation. Yet this is a simple and readily available form of therapy for those patients, the majority of whom had inadequate dietary intake of the selected nutrients.

Some anecdotal notes made during the study are pertinent to the food intake of staff-fed patients. Fifty minutes after the serving of breakfast trays, the observer returned to the unit to collect the tray of one of the patients. The patient had not yet been fed. The nursing assistant responsible for feeding her was found reading comics in the staff lounge.

In another instance the observer entered the room just as a nursing assistant was preparing coffee for a patient. She emptied two packets of sugar and one of cream into the coffee and said, "I hope you like it this way," to which the patient replied, "No, I like it just as is--black." Her response was "Next time," and she poured large amounts into his mouth which he swallowed reluctantly.
One patient had his wife or son present to feed him for all meals except one. At that time the tray was simply left on his overbed table which was out of his reach. About an hour later when the researcher came to the unit and asked the aide why the food was untouched, she said she had assumed his wife would return but she had not. The patient refused to eat lukewarm food when the aide offered to feed him.

One patient had been fed from admission until the day prior to the interview. During the initial interview with him, the researcher asked which feeding method he preferred. His reply was, "I'd rather do it myself."

One of the self-fed patients vocalized the desire to be fed, but the nursing staff were united in their refusal to do so. This policy had been in effect prior to the study, and they were very interested in the analysis of his intake. This patient was one of the four who achieved 100 percent of the RDA for each nutrient.

**Implications for Nursing Actions**

Based on the findings and observations of this study, an adequate diet can be achieved by the hemiplegic CVA patient who feeds himself and his diet is more likely to be adequate than that of the staff-fed patient.

The role of the nurse in the situation covers many aspects. She is close to the patient at meal times and in a position to observe what he does eat. With background
knowledge of nutrients necessary for optimal functioning of the body and the approximate amounts of various nutrients in foods, she can evaluate the patient's intake. Assessment of clinical findings such as weight changes and laboratory data also relate to the nutritional state. She can play a major role in helping the patient increase his intake and achieve a more balanced diet. Other points to consider are a comfortable position and correct height of the food tray. Socializing at mealtimes and the nurse's praise for his attempts to feed himself are means of providing psychological impetus to self-feeding. Some education can be carried out by teaching the patient which foods are more nutritious and helping him choose those foods, especially if his appetite is decreased.

For patients who have difficulty feeding themselves, assistance in opening cartons and cutting meat, can let the patient conserve his energy for the actual feeding process. The nurse can spend a few minutes with the patient who is feeding himself and give support and encouragement for his efforts, resisting the impulse to take over the feeding. These patients need more time to eat than others and benefit from not being rushed or having the tray removed before they are through eating.

Loss of weight can be attributed to either loss of excess fluid or the use of tissues to provide energy needs if the diet does not supply sufficient calories. In the patient
who is edematous or obese, this is therapeutic. However, catabolism of tissues in other patients is to be avoided. Weighing a patient daily or every other day, preferably in the morning before breakfast, is an accurate way to assess his status and should be a nursing action in the care of stroke patients, as indicated by this study's finding an average loss of 3-3/4 pounds per day. Loss of weight in a patient who is not obese or edematous can be avoided by insuring an adequate intake and balance of carbohydrate, protein, and fat in the diet.

Supplemental feedings given a patient can be chosen for high nutritional content. Contributing to both groups of patients in this study achieving 100 percent of the RDA for Vitamin C was the fact that, when a patient asked for extra food or juice, orange juice was given most often. However, snacks could be served which are planned to supplement meals.

Also, the nurse can serve as the liaison between patient, doctor, and dietician. For example, she can request a change to a soft diet for the patient who has difficulty chewing. She can request the dietician's services for instructing the patient on a special diet, then reinforce the instruction on the unit. The dieticians with whom the researcher worked were all surprised and favorably impressed with a nurse's interest in nutrition.
Recommendations for Further Study

1. Data on a larger number of patients in each of the four groups would give a better basis for statistical conclusions.

2. Nutrient intake studies for a longer period of time would give a better indication of the patients' overall eating patterns.

3. Food consumption could be analyzed for the additional nutrients which were not included in this study but are also necessary for optimal functioning of the body.

4. Stepwise multilinear regression could be done to show the contribution to nutrient intake made by each of the many variables involved.

5. Laboratory tests can be used to evaluate the physical state of the patient. Variables of omission or differences in time relationship could be controlled by performing the desired tests on all patients immediately before, during, or after the study.

6. Long-range nutritional study and complete correlation with laboratory and physical assessment could provide a more accurate determination of the nutritional needs of the patient who has had a CVA.
Patients who have experienced a cerebrovascular accident (CVA) usually have residual paralysis which makes it difficult for them to carry out activities of daily living. Eating is one such activity. The body must receive nutrients to supply the energy, vitamins, minerals, and constituents necessary for growth and repair of tissues and other body functions.

Little research has been done on the nutritional needs of the CVA patient. For purposes of this study, the recommended daily allowances (RDA) were used to determine the therapeutic amounts of each nutrient.

The problem underlying this study was to determine whether the intake of the hemiplegic was better if he fed himself or if he were fed by the staff. Another aspect to be considered was the difference in intake between those affected on the dominant or non-dominant side. The first hypothesis of the study was that patients who fed themselves would achieve a significantly higher intake of nutrients than those patients dependent on having others feed them. The second hypothesis was that patients with hemiplegia of the
non-dominant side would have a higher intake than those affected on the dominant side.

The first hypothesis, higher nutrient intake for self-feeders, follows the principle of authors in the field of rehabilitation who encourage early return to independence for the disabled. The principle of "deterioration from disuse" (Kottke, 1965, p. 437) provided the theoretical framework for the study, that both the function of voluntary muscles and the desire for independence will atrophy if not stimulated and used.

A sample of 18 hospitalized patients was used in the study. Eleven fed themselves and seven were fed by the nursing staff and/or their families. These were all the patients in the three participating hospitals during the times of data collection who met the criteria. These were that he had experienced a CVA one to four weeks previously, be receiving an adequate diet and taking foods orally, and have residual hemiplegia of an upper extremity.

The researcher observed their food intake for three consecutive days. Weight of each food eaten was calculated by weighing foods before and after meals; the difference represented food consumed. Nursing staff cooperated in reporting food spillage or additional feedings. A nutritional analysis of the diets was performed for intake of calories, carbohydrates, proteins, iron, calcium, and Vitamin C. Average daily consumption was then compared to the RDA
of the Food and Nutrition Board of the National Research Council (1968) (see Appendix D) and intake expressed as a percentage of the RDA.

Only four patients, all self-fed, achieved 100 percent or more for each of the selected nutrients. Three were moderately paralyzed, two on the dominant side. The fourth was severely paralyzed on the dominant side. This supports the conclusion that the majority of the patients consumed less than adequate amounts of nutrients.

The one exception was Vitamin C. For this nutrient both staff- and self-fed groups had a mean intake greater than 100 percent. Both groups had a mean intake for calories and calcium of less than 100 percent. The self-fed group achieved an intake of 100 percent for carbohydrate, protein, and iron while the staff-fed group did not.

An F-test by analysis of variance was done between the groups' means for each nutrient to determine whether statistically significant differences existed. Calorie, carbohydrate, and protein differences were all significant at the .01 level of probability. The difference between iron intake was significant at the .03 and between calcium, .04. Thus, for these items, the first hypothesis of the study was supported for these five nutrients.

The second hypothesis of the study was that the intake of patients affected on the non-dominant side would be greater than the intake of patients affected on their
dominant side. However, for both the self-fed and staff-fed patients, the groups paralyzed on the dominant side achieved a higher mean intake for all nutrients except calcium. Thus, the second hypothesis was rejected, with the exception of calcium.

Patients with strong food preferences or who were supplied with large amounts of a particular food, dairy products, or orange juice, tended to exclude other types of foods, such as meats, which resulted in unbalanced diets and was seen as a dietary deficiency of nutrients not provided in the preferred foods. No patient received supplemental vitamins or minerals.

Assessment of clinical data also yielded information about a patient's nutritional status. Patients were weighed during the time of study. Thirteen patients lost weight; average loss was 3-3/4 pounds. Three patients gained weight averaging 1-1/2 pounds. Two had no change in weight.

The findings of this study have shown that a better intake of nutrients can be achieved by the CVA patient who feeds himself. The role of the nurse is to provide encouragement and support in this achievement, as well as assistance with difficult tasks such as opening cartons and with positioning the patient comfortably. Familiarity with nutritional values of foods will give her the background to evaluate his intake, offer snacks which provide nutrients
in which he may be deficient and to counsel the patient regarding his diet.

Much additional research could be done in this area. An accurate identification of the amounts of nutrients needed by the CVA patient would provide a more solid basis for studies. A larger number of patients should be used to make more valid statistical inferences. Long-range studies could include diet analysis of more nutrients over a longer period of time and correlating results with intervening variables.
APPENDIX A

PATIENT DATA FORM

NAME: 

AGE: 

SEX: 

Diagnosis: 

Date of CVA: 

Date of Admission: 

HEIGHT: 

WEIGHT: 

Day preceding study _____ Day 1 _____ Day 2 _____  

Day 3 _____ Day following study _____ 

Hemiplegia: right _____ left _____ (minimal, moderate, severe) 

Dominant side: right _____ left _____ 

Activity/Exercise: 

Bed patient 

Range of motion _____ active _____ passive _____ 

Wheelchair _____ hours per day _____ 

Physical therapy 

Ambulatory _____ 

Study Group I 

Patient fed by self _____ used self-help devices _____ 

fed by staff _____ family _____ other _____ 

Diet order: 

selective: yes _____ no _____ who makes selection _____ 

Food Allergies: 

Current Medications: 

Aphasia: yes _____ no _____ (sensory, motor, both) 

Edema: 

Lab Values 

Hemoglobin _____ date _____ 

Hemotocrit _____ date _____ 

58
APPENDIX B

RECORD OF 24-HOUR FOOD INTAKE USED BY NURSING STAFF

<table>
<thead>
<tr>
<th>NAME</th>
<th>Food</th>
<th>Amount eaten</th>
<th>ROOM</th>
<th>Food</th>
<th>Amount eaten</th>
<th>DATE</th>
<th>Food</th>
<th>Amount eaten</th>
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<tr>
<td></td>
<td>Breakfast</td>
<td></td>
<td></td>
<td>Lunch</td>
<td></td>
<td></td>
<td>Dinner</td>
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</tr>
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<td></td>
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</tr>
</tbody>
</table>

Pt fed by

- self
- used self-help device
- staff
- family
- other

Midmorning Afternoon Evening
APPENDIX C

RECORD OF 24-HOUR FOOD INTAKE AND NUTRIENT ANALYSIS USED BY RESEARCHER

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<thead>
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<th>NAME</th>
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</tr>
<tr>
<td>Lunch</td>
<td></td>
</tr>
<tr>
<td>Afternoon</td>
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<tr>
<td>Dinner</td>
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<tr>
<td>Evening</td>
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<td>Total</td>
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## APPENDIX D

### RECOMMENDED DIETARY ALLOWANCE FOR SELECTED NUTRIENTS

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<thead>
<tr>
<th>SEX</th>
<th>AGE (years)</th>
<th>PROTEIN (gram)</th>
<th>IRON (mg)</th>
<th>CALCIUM (gram)</th>
<th>VITAMIN C (mg)</th>
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<tr>
<td>MALE</td>
<td>55-75+</td>
<td>65</td>
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<td></td>
<td>55-75+</td>
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<td>10</td>
<td>0.8</td>
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<tr>
<td>ID#</td>
<td>Feeding Method</td>
<td>Side Affected</td>
<td>Severity of Hemiplegia</td>
<td>Diet Order</td>
<td>Calories</td>
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<td>-----</td>
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<td>------------------------</td>
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<td>1</td>
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<td></td>
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<td>Soft,</td>
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<td></td>
<td></td>
<td></td>
<td>pureed</td>
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<td>15</td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>5</td>
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<td>Regular</td>
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<td>50</td>
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<td>64</td>
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<td>Soft,</td>
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<td>Severe</td>
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### APPENDIX F

**CALCULATION OF CALORIC REQUIREMENTS FOR INACTIVE PATIENTS**

<table>
<thead>
<tr>
<th>Patient Number</th>
<th>Age</th>
<th>Height in Inches</th>
<th>Ideal Weight in Pounds</th>
<th>Caloric Allowance, RMR at age 22 years</th>
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<td>70</td>
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<td>1740</td>
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<td>1970</td>
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<td>69-1/2</td>
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<td>1880</td>
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<td>17</td>
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<td>73-1/2</td>
<td>175±15</td>
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<td>1900</td>
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REFERENCES


