WE THE UNDERSIGNED HAVE APPROVED THE PROJECT MODEL FOR DETERMINING THE APPROPRIATE NUTRITIONAL FORMULA FOR PATIENTS WITH VARYING CLASSES ENTITLED OF ILLNESS.

SUBMITTED BY JOSEPH P. KMET

THIS PROJECT IS SUBMITTED TO THE COMPUTER SCIENCE DEPARTMENT OF CORPUS CHRISTI STATE UNIVERSITY AS PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE MASTER OF SCIENCE DEGREE IN COMPUTER SCIENCE.

[Signatures and dates]
Model for Determining the Appropriate Nutritional Formula for Patients with Varying Classes of Illness.

Graduate Project Proposal *submitted for CS 595

By

Joseph P. Kmet
August 1984

Committee Approval
Mr. A. Bush, Chairman
Mr. R. Dietersing
Mr. D. Perkins
Introduction

To fulfill the requirements for the completion of CS 595, I submit this proposal for approval by my faculty committee consisting of:

Mr. A. Bush, Chairman
Mr. R. Diersing
Mr. D. Perkins

This proposal provides:

- a definition of the problem;
- a rationale for the project;
- an approach to be followed in completing the project;
- the scope of the project;
- the resources to be used in completing the project;
- system flowcharts.

Problem Definition

The objectives of this project are to design and implement a BASIC language based, micro-computer simulation model for determining the appropriate formula for total parenteral nutrition for patients with varying classes of illnesses. The model will use input laboratory measurements and anthropometric data and measurements to determine the degree of starvation and electrolyte imbalance, and recommend the amounts of protein, carbohydrate, fats, and electrolytes that should be administered daily to reverse catabolism and ionic imbalance. Additionally, the program will create a random access disk file for individual patient records and will allow for discharge and subsequent re-admission.

Rationale for the Project

One of the many duties of an institutional pharmacist is to provide nutritional information and replacement therapy schema to assist the physician in restoring or preventing the deterioration of a patient's adequate nutritional state in conditions where enteral alimentation is inappropriate, inadequate, or unsuccessful. The preparation of these schema take considerable time and therefore increase the patient's costs for hospitalization. The project will provide the needed information for adequate nutrition with minimal input and high cost professional participation.

Approach to the Project
To meet the objectives for the project, a two step approach is indicated:

1. Develop a routine to either input a new patient data into the database or update a previously entered patient’s laboratory data.

   A. Inputs:

   1. Develop a routine to input a patient to the data base to include: a nutritional history, physiologic and anthropometric measurements; and using this data, develop an appropriate parenteral nutritional replacement regimen.

   2. Develop a routine to update a patient record in the patient data base. To examine the previously entered physiological data to detect a trend in the electrolyte levels and either change or continue the present nutritional regimen to maintain ionic equilibrium.

   3. Develop a replacement formula data base that will provide adequate replacement for at least 90% of the enrolled patients.

   4. Develop a routine which will:
      - read all input data;
      - edit data for incorrect inputs; and
      - store the new data or patient information in the appropriate record in the data base;

   5. Develop a routine which will calculate the length of therapy and provide for the addition of necessary vitamins and trace elements to the formula.

   B. Outputs:

   Develop a routine which will provide reports and labels for each type of patient:

   1. A detailed nutritional assessment for a newly entered patient;


2. Develop a users’ manual which will be divided into the following sections:

   A. An introduction;

   B. A section on inputs which discusses:
      - the formats for the inputs;
      - a discussion on the model for estimating electrolyte losses;
and
the underlying physiological assumptions for the model;

C. A discussion of the structure of the patient data base and
how
the storage area can be recovered;

D. A section on reports which will provide samples of the
various
outputs with a narrative of each type of report;

E. A section which discusses:

what data is most essential to the program and which data
can be used as 'normalized' textbook data;

a global view of the interactions of each input with other
inputs and their effects on the appropriateness of the final
formulation.

Scope of the Project

This project has the following limitations:

1. The present development does not allow for major organ
failures of either the liver or kidneys.

2. Input data must, for certain critical electrolytes, be
from objective laboratory or physical measurements.

3. The development of nutritional schema will limited to
adults.

4. The active patient data base for this project will be
limited to 200 patients.

5. The replacement formula data base will be limited to 4
formulae.

Resources

This model is an interactive system designed to run on an IBM-PC
environment using PC-DOS or MS-DOS 16 bit operating system, and will
require a single disk drive. The entire system will be written in
BASIC.
1. INPUT PATIENT I.D.

NEW PATIENT ?

YES → 2.

NO → ACTIVE PATIENT ?

YES → SEARCH ACTIVE RTN

RECORD FOUND ?

YES → MAKE ACTIVE RTN

NO → ERROR RTN

NO → SEARCH PAST RTN

RECORD FOUND ?

YES → MAKE ACTIVE RTN

NO → ERROR RTN

B

INPUT PATIENT DATA

COMPARE MODEL RTN

CHANGE LYTE S ?

NO

CHANGE IN ROUTE ?

YES

3.

CHANGE LYTE S RTN.
Users Manual and Background
Information for the Model for
the Determination of the
Appropriate Nutritional Formula
for Patients with Varying Classes
of Illness.

Submitted in fulfillment of
CS 595 and in partial fulfillment
for the Degree of Master of Science
in Computer Science.

Corpus Christi State University
November 1984

Joseph P. Kmet
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INTRODUCTION

The value of nutritional support in Clinical Medicine has been well established. Protein calorie malnutrition can be prevented and serious nutritional deficiencies corrected by appropriate regimens of nutritional therapy. Patients requiring nutritional and metabolic support may receive treatment via enteral and/or parenteral routes as necessary and appropriate.

The most efficient means of providing a systematic approach toward achieving optimal nutritional therapy involves using a mechanism such as a computer program designed to take input data and make comparisons against standard values and providing consistent interpretations of the patient's state of malnutrition and suggesting appropriate nutritional replacement.

This manual and program is meant to be used as a guideline for parenteral and enteral nutritional support in adult patients who have no major organ failure of either the liver or kidneys.

INDICATIONS

Adult patients that should benefit from this program include:

1. Patients with short bowel syndrome.

2. Patients with prolonged obstruction, either mechanical or functional.

3. Patients with malabsorption.

4. Patients with functional gastrointestinal disorders; e.g. hyperemesis gravidarum, anorexia nervosa, CVA or psychogenic vomiting, which is non-responsive to drug therapy or tube feedings.

5. Inability to swallow after head-and-neck surgery or trauma.

6. Patients who regurgitate and may aspirate because of an obtunded sensorium.

7. Severe chronic myocardial or respiratory failure with depressed appetite and increased metabolic demands.

8. Patients with excessive metabolic demands; e.g. extensive and severe burns, severe sepsis, massive multiple trauma, which cannot be met by the gastro-intestinal tract.

9. Patients with ileitis or Crohn's disease, so as to put the bowel at complete or partial rest.

10. Patients with fistulas of the gastro-intestinal tract.
11. Patients who are protein depleted that need surgery and in whom nutritional status cannot be otherwise be restored; e.g., gastrocolic fistula, cancer of the stomach, lymphoma of the bowel.

12. To improve or maintain nutrition in patients with malignancies, who are receiving chemotherapy and/or radiation therapy, or undergoing major surgery, when adequate nutrition cannot be maintained by other means.

13. The patient who has not eaten for one week and will not eat for another week, he/she should be considered for parenteral or enteral nutrition.

GOALS

A. To attain a positive nitrogen balance of from 4 to 6 grams.

B. A weight gain of at least 1/4 pound a day.

C. To promote wound healing.

NUTRITIONAL ASSESSMENT

A natural point from which to begin nutritional assessment consists of three traditional admission exercises:

A. Medical history.

B. Physical examination.

C. Laboratory assessment.

The information gathered by these exercises when input to the program will provide a nutritional evaluation and appropriate nutritional supplement to achieve the stated goals.
GETTING STARTED WITH THE PROGRAM TPN

The computer is started in the normal manner, with the program disk in drive A. At the prompt >A from the operating system, type BASICA <cr>. When the screen indicates that basic is ready for input, type RUN TPN <cr>.

The first message that will appear will be to enter the current date as numbers in the following manner: YYMMDD. This is to facilitate the calculation of changes in time. After the date is entered, the Main Menu appears:

PARENTERAL NUTRITION DEVELOPMENT

INPUT THE NUMBER OF YOUR CHOICE

1. INITIAL SET-UP OF THE FILE SYSTEM
2. INPUT A NEW PATIENT TO THE DATA BASE
3. UPDATE A CURRENT PATIENT
4. DELETE, DISCHARGE, OR BROWSE THE PATIENT OR FORMULA DATA BASE
5. END THE SESSION

Unless this is the first time this system is being used, you will have no need for choosing option # 1 (this option is explained in Appendix A), the other four choices are self-explanatory.

INPUTING A NEW PATIENT TO THE DATA BASE, CHOICE #2

Choice #2, input of a new patient to the data base starts with subjective input of some patient information: 1) Patient's name (first name, middle name, or initial, and last name, and any extensions, i.e. jr, III, etc up to 20 characters); 2) an identification number - usually the social security number - input with the dashes, i.e. xxx-xx-xxxxx; 3) the hospital admission number; 4) the patient's age in years; 5) sex; 6) race; 7) the date (this can be the current date or a previous evaluation date); 8) height in inches; 9) weight in pounds; 10) weight loss, if any; and 11) the duration, in days, of the weight loss.

After this last item is entered, the screen clears and the data is listed to take care of any incorrect entries. If there are no errors, one need only input a carriage return to continue.

The next input routine concerns the nutritional history, medical history, and the diagnosis. These are filled in with simple sentences for each entry (not to exceed 80 characters each) as they are intended only as a brief description for the subsequent nutritional assessment print-out. Again, there is an edit and correction mechanism.
The third section concerns objective data input. You will be asked for anthropometric measurements:

ANTHROPOMETRIC MEASUREMENT INPUT SECTION

UNITS OF MEASUREMENT: INCHES(1), METRIC(2), NOT DONE(3)

These measurements may be entered in English (inches, etc.) or metric (cm, mm) and will be converted as are all measurements to the metric system. Choosing 1 or 2 you will be asked for the wrist, midarm circumference and triceps skinfold. If no anthropometric measurements were done, you will be asked for an estimation of body frame size:

INPUT ESTIMATED FRAME SIZE: S(MALL), M(EDIAN), L(ARGE)

The above data, whether actual measurements or estimations, are used to estimate the Ideal weight and Basal Metabolic Rate for the patient.

The next screen will be a query for your best guess as to the stress factor for the patient:

INPUT STRESS FACTORS:

1. MINOR OPERATION
2. SKELETAL TRAUMA
3. MAJOR SEPSIS
4. SEVERE BURNS

FACTOR S

1.2
1.35
1.6
1.9

One can input any value between 1.2 and 2, the above indicate only average values for stress for a given condition.

A companion screen to this is one that asks for the patient's activity, usually there can only be two activities: 1) confined to bed or 2) allowed to ambulate about the hospital.

INPUT ACTIVITY FACTOR

1. CONFINED TO BED
2. AMBULATORY

FACTOR S

1.2
1.3

These two factors, stress and activity are then multiplied together to provide a factor that is again multiplied times the Basal Metabolic Rate to estimate the total energy needs for a patient (see appendix B)

Now the sections that follow ask for the input of selected laboratory values: 1) sodium, 2) potassium, 3) chloride, 4) carbon dioxide (or bicarbonate), 5) calcium, and 6) phosphate from serum determinations. From urine determinations are 1) sodium,
2) potassium and 3) chloride. Finally, the other most
significant physiological laboratory measurements are asked to be
input, they are: 1) albumin, 2) total protein, 3) blood urea
nitrogen (BUN), 4) serum glucose, 5) serum osmolarity, 6) serum
creatinine, 7) total iron binding capacity, and finally, 8) a 24
time urine urea nitrogen value.

Of course, all of the above input will have exhaustive
edit/correction routines before the data gets into the program.

The last section that requires interaction on your part is the
section that initiates the decision process for determining the
appropriate formula and route for the required nutritional
augmentation, if needed. There will appear on the screen a
series of one line questions that are answered yes or no (Y or
N) or with a value.

**DAILY INTAKE OF PROTEIN IN GRAMS:**
**RECENT SURGERY OR CHEMOTHERAPY? (Y OR N)**
**NUMBER OF DAYS PATIENT HAS NOT EATEN?**
**RECENT ILLNESS LASTING THREE WEEKS OR LONGER (Y OR N)?**

and finally the most important question:

**IS THE G.I. TRACT FUNCTIONING? (Y OR N)**

Now you will be given a prompt to set the paper to top of page.
It is best that you use form feed button to initiate a form feed
and then manually set the perforation in the paper to the print
head (at least for the first patient report as the program sets
to top of page for each subsequent report) and press the enter
key.

The program will then print a nutritional evaluation (example 1)
and append the new patient data to the patient data base
(structure in Appendix C).

**NUTRITIONAL EVALUATION OUTPUT EXPLANATION**

In the calculated values section:

Ideal weight is based on the patients' anthropometric
measurements of height and wrist circumference ratio. The
percent of ideal weight is actual weight divided by the ideal
weight. The same procedure is used for the usual weight and
percent weight loss. The estimation of weight deficiency is from
the following:

\[
\begin{align*}
< 10\% & \text{ weight loss } = \text{ mild;} \\
\geq 10\% \text{ and } \leq 25\% & \text{ weight loss } = \text{ moderate;} \\
< 25\% & \text{ weight loss } = \text{ severe.}
\end{align*}
\]

Fat reserve is determined using the patient's triceps skin fold
and comparing it as a percentage of normal. The estimation of

-3-
fat deficiency is from the following:

- >= 90% of normal = normal fat reserves;
- >= 80% and < 90% = mild deficit;
- >= 70% and < 80% = moderate deficit;
- < 70% of normal = severe deficit.

There are two estimations of lean muscle mass. Each is derived from different inputs. The first uses the mid arm circumference and calculates the mid arm muscle circumference and this gives the arm muscle area. This area is divided by a normal value for the sex and the resulting percentage of normal gives the following estimations of lean muscle mass:

- >= 90% of normal = normal lean body mass;
- >= 80% and < 90% = mild deficit;
- >= 70% and < 80% = moderate deficit;
- < 70% of normal = severe deficit.

The other method for determining lean body mass is using the creatinine height index. This method is only done if there is a value input for urinary urea nitrogen (UUN) test. The calculation uses a constant value of 18 mg/kg ideal weight/day urea excretion for females and 23 mg/kg ideal weight/day for males. Therefore, the calculated ideal weight times the excretion factor would give the ideal urinary urea nitrogen. So, to estimate lean body mass one divides the measured UUN by the calculated ideal UUN.

The estimation of malnutrition as a function of the most important serum protein, albumin, is based on the following:

- >= 3.5 mg/dl = no deficiency;
- >= 3 and < 3.5 = mild deficiency;
- >= 2.1 and < 3 = moderate deficiency;
- < 2.1 mg/dl = severe deficiency.

Finally, nitrogen balance is calculated from the UUN value, protein intake in grams. Of course if there were no input value for the UUN the results of this calculation would be of questionable value.

UPDATE OF A CURRENT PATIENT, CHOICE #3

The first screen prompt from the program will ask for the patient's name and identification number. The program now opens the patient data file and searches for the record. When the record has been found, the patient name and identification number is displayed on the screen to indicate that the proper record had been found. If there was no success in finding the record, a message would have been displayed indicating a possible error in the identification number and return you to the main menu.
Now, assuming that you were successful the first time around, the program will examine the patient's code to determine if the record is either active or a re-admission. First we will describe the update of a current patient and address the re-admission later.

For a current update, the program asks for the latest laboratory values in the same format as for a new patient (including the error editing process). Then the program goes through a routine comparing eight of the most significant current laboratory values, 1) sodium, 2) potassium, 3) chloride, 4) carbonate, 5) calcium, 6) glucose, 7) albumin, and 8) BUN, with the values stored in the patient record and uses this comparison to provide trend information about the patient's electrolyte status.

Now the program will ask if you have taken new anthropometric measurements

NEW ANTHROPOMETRIC MEASUREMENTS? (Y OR N)

If the answer is yes, there is a branch to obtain this information and when obtained the program will determine the appropriate nutritional formula and route. If the answer were no, the program will assume a continuation of previous therapy. The next question presented is:

NEW STRESS FACTORS? (Y OR N)

A positive reply branches to obtain new stress and activity factors and returns calculating new BMR and total energy requirements. Of course, if the answer were negative the previously stored data would be used.

Now the program will produce a report (example 2) and update the patient record with the new values that have input and calculated and return control to the main menu.

READMISSION OF A PATIENT

The program will fetch the appropriate patient record and upon examination of the code finds that this patient had been previously discharged. The program will then present a screen asking for subjective information: Name, Patient I.D, etc., and step through the same sequence of screens as those for a new patient: subjective input, objective input, anthropometric measurements, laboratory values, and the questions concerning protein intake, surgery, etc. (see section on new patient input). The output report will be the same as example #1 as one can consider a readmission, even for the same condition, as a new patient with only vague allusions to a past condition or treatments.

DELETE, DISCHARGE, OR BROWSE THE PATIENT OR FORMULA DATA BASE, CHOICE #4
Selection of this choice provides a series of screens. The first is:

WHICH FILE DO YOU WISH TO SEE

1. PATIENT FILE
2. FORMULA FILE
3. RETURN TO MAIN MENU

If the choice is to see the patient file the next screen will provide the following options:

INPUT WHICH ACTION

1. DELETE A PATIENT
2. DISCHARGE A PATIENT
3. BROWSE THE FILE
4. FINISHED, RETURN

If you desire to delete a patient record from the data base, the program will ask for the patient’s name and identification number. It then goes out and searches the file for the indicated record. When the proper record has been found, the patient’s name and identification are printed both on the screen and the printer (to give a permanent record of the deletion) with the appropriate message of a delete and the date. The code section of the record is now changed to “E” and the remaining space in the record is set to nulls and zeros and the record is made available for future additions to the data base.

Discharge works in the same way, including the audit record. But, the code is changes to “D” and the patient’s name and identification number are all that is kept in the record (all other data is removed to prevent inappropriate use in the case of a readmission).

Both selections return to the ACTION screen.

Browsing the file will present each record in the file in sequence. There are pauses placed in specific areas so that you may have time to study the information thoroughly. The pauses are controlled by you key input. When the end of the file has been reached, you are returned to the ACTION screen.

This completes program action and explanation, further information concerning this program and the parameters, values, and equations used can be found in the appendices.
APPENDIX A

DATA BASE INSTALLATION

Patient Files:

Selection of choice #1 of the main menu, Initial Set of of File System, provides a screen which asks:

WHICH FILE DO YOU WISH TO INITIALIZE.?

1. PATIENT
2. FORMULA
3. SESSION FINISHED

Selection of Patient invokes a routine that reserves a portion of the disk space and is named PATNUT.DAT. This space is limited in size to that of the amount of space required for two hundred records plus an overflow area of thirty percent. When initialization has been completed, there is displayed on the screen "PATNUT.DAT HAS BEEN INITIALIZED" and returns you to the menu.

Selection of FORMULA, again invokes a routine that presents a screen which begins to ask for the amounts of specified ingredients. They are, in total concentration per liter, as follows:

ENTER AMINO ACIDS (GRAMS)
ENTER DEXTROSE (GRAMS)
ENTER SODIUM (MEQ)
ENTER CHLORIDE (MEQ)
ENTER ACETATE (MEQ)
ENTER CALCIUM (MEQ)
ENTER MAGNESIUM (MEQ)
ENTER PHOSPHATE (MEQ)
ENTER VITAMINS (ML)
ENTER TRACE ELEMENTS (ML)
ENTER LIPID DISCRIPTION
ENTER HEADAER DESCRIPTION

The food code is the formula number which your institution assigns for a specific condition, i.e., central, peripheral D-10, etc. and is used by the program in its decision mechanism.

Each amount in input and a carriage return is the signal for the next input.

The lipid description is limited to 50 characters (including blanks) that for example, can be:

USE 500 ml,10% LIPOID DAILY AS A CALORIE SOURCE
or
USE 500 ml,10% LIPOID MTH FOR ESSENTIAL FATTY ACID REPLACEMENT
The header description is the type of parenteral nutrition (limited to a total of 55 characters):

STANDARD CENTRAL ALIMENTATION D-25, 1020 Kcal/L
STANDARD PROTEIN SPARING D-5, 240 Kcal/L.

After all this has been input, there is a display of all the information with a request for editing, if needed. Input a zero if all is correct, or follow the directions. The program will now write this formula to the formula data base and print on the screen:

FORMULA ## HAS BEEN ENTERED

and will ask you if there is further input (Y or N), if your response is yes, the above will be repeated, if the answer is no, the program will append a blank record to the end of the file with a code of "N" and print:

FORMULA FILE, FORMULA.DAT HAS BEEN INITIALIZED

and return you to the initialization menu, where you can end the session.
APPENDIX B.

NUTRITIONAL ASSESSMENT

1. Weight/Height

The patient’s ideal body weight is derived from the following equation:

\[
\text{Ideal weight} = ((\text{height} - 155) \times \text{corr factor}) + \text{std wt (for 155 cm)}
\]

The correction factor is a percentage increase over the standard weight that differs with an increase in frame size. These corrections factors are:

<table>
<thead>
<tr>
<th>Frame</th>
<th>Correction factor</th>
<th>Standard Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small frame</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(m)</td>
<td>0.675</td>
<td>50.0;</td>
</tr>
<tr>
<td>(f)</td>
<td>0.622</td>
<td>41.8;</td>
</tr>
<tr>
<td>Medium frame</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(m)</td>
<td>0.719</td>
<td>53.6;</td>
</tr>
<tr>
<td>(f)</td>
<td>0.643</td>
<td>45.0;</td>
</tr>
<tr>
<td>Large frame</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(m)</td>
<td>0.794</td>
<td>58.2;</td>
</tr>
<tr>
<td>(f)</td>
<td>0.670</td>
<td>49.5;</td>
</tr>
</tbody>
</table>

All measurements are in the Metric system.

From this Ideal Weight the program then derives the Percent Ideal body weight by the following:

\[
\text{Ideal Weight \%} = (\text{actual weight/ideal weight}) \times 100;
\]

and

\[
\text{Usual Weight \%} = (\text{actual weight/usual weight}) \times 100;
\]

finally,

\[
\text{Weight loss \%} = ((\text{usual wt} - \text{actual wt})/\text{usual wt}) \times 100.
\]

Generally, the percent weight loss from usual weight is given the following weighted definitions:

less than ten percent is a limited deficiency;
from ten to twenty-five percent is a significant deficiency;
and greater than twenty-five percent is a severe deficiency.

It must be remembered that weight is a relative factor. Conditions such as edema and obesity may distort the accuracy of the weight/height measurements, therefore additional measurements of lean body mass must be obtained.

2. Triceps Skinfold
Fat reserves are estimated by measuring the triceps skinfold. A fold of skin on the posterior aspect of the nondominant arm, midway between the shoulder and the elbow, is grasped and gently pulled away from the underlying muscle. Calipers are applied to measure the skinfold. The result of this measurement is then applied to the following table.

<table>
<thead>
<tr>
<th>Triceps skinfold (mm)</th>
<th>Estimation of Fat Reserves</th>
</tr>
</thead>
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<tr>
<td>Sex</td>
<td>Standard</td>
</tr>
<tr>
<td>Male</td>
<td>12.5</td>
</tr>
<tr>
<td>Female</td>
<td>16.5</td>
</tr>
</tbody>
</table>

The degree of depletion is estimated as follows:

- 90% of standard: No depletion;
- 80% of standard: Mild depletion;
- 70% of standard: Moderate depletion;
- 60% of standard: Severe depletion.

3. Mid-Arm Circumference

To determine the patient's lean body mass or degree of somatic protein depletion, one measures the mid-arm circumference. Another important indicator of the level of somatic protein deficits is the arm muscle circumference. This is calculated utilizing the mid-arm circumference and the triceps skinfold:

\[
\text{Arm Muscle Circumference (cm) = mid-arm circum - (0.314 x triceps skinfold (mm))}
\]

The following table defines the degree of depletion of lean body mass as a function of the arm-muscle circumference.

<table>
<thead>
<tr>
<th>Arm-muscle Circumference Muscle Mass (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
</tbody>
</table>

Again, the degree of depletion is defined as:

- 90% of standard: Not depleted;
- 80% of standard: Mild depletion;
- 70% of standard: Moderate depletion;
- 60% of standard: Severely depleted.

4. Creatinine/Height Index

Creatinine is elaborated from active muscle at a constant rate in proportion to the amount of muscle a patient has. Therefore, by comparing the urinary creatinine to the theoretical ideal urinary creatinine for a particular height, the percentage of lean muscle mass can be estimated. This index is more accurate and more sensitive to the level of functional somatic protein than other measurements. It is important to note that without physical therapy, the creatinine
height index will not change. Activity of the muscle is equally as important as feeding. Assuming normal renal function, a 24 hour urine collection for creatinine is measured for creatinine. After determining the ideal urine creatinine value from the following table, one uses the following equation:

\[
\text{Creatinine/Height Index} = \frac{\text{act urine creat}}{\text{ideal urine creat}} \times 100
\]

Ideal Urinary Creatine Values Table

<table>
<thead>
<tr>
<th>Height (cm)</th>
<th>Male</th>
<th>Height (cm)</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>157.5</td>
<td>1288</td>
<td>147.3</td>
<td>830</td>
</tr>
<tr>
<td>160.0</td>
<td>1325</td>
<td>149.9</td>
<td>851</td>
</tr>
<tr>
<td>162.6</td>
<td>1359</td>
<td>152.4</td>
<td>875</td>
</tr>
<tr>
<td>165.1</td>
<td>1386</td>
<td>154.9</td>
<td>900</td>
</tr>
<tr>
<td>167.5</td>
<td>1426</td>
<td>157.5</td>
<td>925</td>
</tr>
<tr>
<td>170.2</td>
<td>1467</td>
<td>160.0</td>
<td>949</td>
</tr>
<tr>
<td>172.7</td>
<td>1513</td>
<td>162.6</td>
<td>977</td>
</tr>
<tr>
<td>175.3</td>
<td>1555</td>
<td>165.1</td>
<td>1006</td>
</tr>
<tr>
<td>177.8</td>
<td>1596</td>
<td>167.6</td>
<td>1044</td>
</tr>
<tr>
<td>180.3</td>
<td>1642</td>
<td>170.2</td>
<td>1076</td>
</tr>
<tr>
<td>182.9</td>
<td>1691</td>
<td>172.7</td>
<td>1109</td>
</tr>
<tr>
<td>185.4</td>
<td>1739</td>
<td>175.3</td>
<td>1141</td>
</tr>
<tr>
<td>188.0</td>
<td>1785</td>
<td>177.8</td>
<td>1174</td>
</tr>
<tr>
<td>190.5</td>
<td>1831</td>
<td>180.3</td>
<td>1206</td>
</tr>
<tr>
<td>193.0</td>
<td>1891</td>
<td>182.9</td>
<td>1240</td>
</tr>
</tbody>
</table>

Note: the program uses the following creatinine coefficients in calculating the ideal urinary creatinine:

- Males 23 mg/kg of ideal body weight
- Females 19 mg/kg of ideal body weight

5. Albumin

Causes of hypoalbuminemia include poor protein intake, impaired digestion, chronic loss, inadequate synthesis and overhydration. A significant decrease can occur in ten days or less in patients in catabolic stress receiving only 5% Dextrose. Nutritional rehabilitation restores visceral protein synthesis. Although albumin will respond to nutritional repletion, it has a long half-life (20 days) and therefore response to therapy is slow to react. Also, due to its effects on intravascular volume, overhydration or dehydrations will tend to distort the true value.

6. Nitrogen Balance

Nitrogen balance is estimated by a formula based on urine urea nitrogen (UUN) excreted during the previous 24 hours. The value returned from the clinical laboratory will be in TOTAL milligrams per volume received. A constant value of three grams is added to cover
the excretion of non-urea nitrogen and of that lost through skin and intestinal gas. To this value, a constant of 1 gram may be added for each stool.

Protein balance is most commonly determined by using nitrogen as the marker to determine balance. Protein is converted to the appropriate quantity of nitrogen by dividing protein in grams by 6.25 (protein is 16% nitrogen, and dividing by 6.25, it converts it into grams of nitrogen).

True nitrogen balance calculation requires careful analysis of total collections, but for clinical use, an estimate of needs is satisfactory and is readily made. Estimated nitrogen balance prior to the institution of support therapy is extremely important in determining what approach to nutritional support should be employed because it reflects the degree of hypermetabolism. Furthermore, nitrogen balance continues to be important throughout the nutritional therapy of a patient, serving as a monitor of progress toward the patients' therapeutic goals. If the patient remains in a negative nitrogen balance, then the therapy was inappropriate. If the patient is maintained in a positive nitrogen balance of + 4 to + 6, then repair of protein deficits can be anticipated. The test is relatively inexpensive, and when comparing it against wasted expenses on therapy not monitored for nitrogen balance, then it is cost justified. This simple technique is one of the easiest indicators of nutritional success. The test should be repeated three times weekly (at least twice) as it is not the most accurate test and is subject to error.

Calculation of Nitrogen Balance:

Nitrogen Balance = Nitrogen In - Nitrogen Out, where

nitrogen-in is derived from actual intake, and nitrogen-out is calculated from urine urea nitrogen (total mgs converted to grams + 4).

Protein of nitrogen administered may be converted to urea but not excreted. The BUN gradually rises, and unless balance is corrected for urea accumulation, the retained urea will falsely favor positive nitrogen balance. Therefore, assuming normal renal and hepatic function, the following is added to Nitrogen-Out:

\[ \text{Grams nitrogen accumulated} = 60\% \times \text{wt(kg)} \times (\text{change in BUN}/100).\]

7. Nutritional Requirements

Oral intake in the United States is generally excessive. The adult male engaged in a sedentary occupation requires no more than 2000 calories per day and the adult female requires slightly less. Approximately 15% of our normal intake is ingested as protein, 50% as carbohydrate, and the remaining 35% as fat.

Nutritional requirements for the hospitalized patient should be based on the patient’s height, weight, and age as well as the degree of
stress due to his/her condition and treatment modalities.

A. Calculation of Nutritional Requirements

To derive the Total Daily Energy requirements for a patient to establish a positive nitrogen balance and weight gain, it is necessary to calculate a Basal Metabolic Rate using the Harris-Benedict equation for BMR and include an activity factor and an injury factor that best fits the individual's condition.

\[ TDE = BMR \times AF \times IF \]

for males the constants to the BMR equation is as follows:

\[ [66 + (13.8 \times wt) + (5 \times ht) - (6.8 \times age)] \text{ Kcal/day} \]

and for females:

\[ [655 + (9.6 \times wt) + (1.7 \times ht) - (4.7 \times age)] \text{ Kcal/day} \]

where wt = weight in kg, ht = height in cm, age in years

Activity Factor  
1) confined to bed 1.2  
2) out of bed 1.3

Injury Factor  
a) minor operation 1.2  
b) skeletal trauma 1.35  
c) major sepsis 1.6  
d) severe thermal burn 1.9

The value calculated in kilocalories per day may be provided the patient by oral, enteral, or parenteral means.

The rate of protein depletion in stressed patients may be monitored from daily urinary nitrogen losses as discussed above.

Nutritional support should provide 1-2 grams of protein per kilogram body weight per day depending upon the patient's condition.

The goal in patient care for protein intake is to put the patient into positive nitrogen balance or at least into nitrogen equilibrium. This means that the intake must exceed or meet urinary losses.

The response of the body to a given stress is manifested by an increased metabolic rate and in increased breakdown of body protein. These increases are not reversed at the height of the response by providing nutrition, however, providing adequate nutrition does ameliorate the loss of body weight by providing a more positive nitrogen and calorie balance.

If one can stay even with nitrogen loss the patient will have a more uneventful convalescence, better wound healing, ability to fight infection, and early discharge from hospital.

B. Calorie Sources
The energy derived from various nutrients approximates:

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>Energy (Kcal/g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hydrous Dextrose</td>
<td>3.4</td>
</tr>
<tr>
<td>Protein</td>
<td>4.0</td>
</tr>
<tr>
<td>Fat</td>
<td>9.0</td>
</tr>
</tbody>
</table>

Good nutrition also requires the intake of essential amino acids. The essential amino acids for adults are Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Threonine, Tryptophan, and Valine. Histidine and Arginine are considered essential in infants and possible for healing in adults.

NUTRITIONAL IMPLICATIONS OF OTHER SELECTED LABORATORY TESTS

A. Blood Urea Nitrogen

Normal values are 10 to 20 mg per dl in adults. Elevated values occur with increased protein breakdown (starvation, stress, diabetes mellitus, fever, acute MI), renal disease, bleeding ulcer, congestive heart failure, urinary obstruction and dehydration. Values of 50 to 150 mg/dl imply serious renal disease.

Decreased values occur with liver failure, increased protein anabolism, (pregnancy, infancy and childhood, and acromegaly), lowered protein ingestion and absorption, and overhydration. Values of 6 to 8 mg/dl frequently occur with overhydration.

B. Serum Osmolarity

Normal values are 275 to 295 mOsm/L in adults. Calculated values are generally lower than measured values.

\[
\text{Serum Osmolarity} = (\text{serum Na} \times 2) + (\text{BUN}/3) + (\text{glucose}/20)
\]

It is a reliable measure of body hydration status. Changes are generally due to changes in serum sodium concentration.

Elevated in uremia, hyperlipidemia, hypoglycemia and brain disorders where anti-diuretic hormone (ADH) secretion is abnormal.

Decreased in conditions of body water excess (Addison’s disease, lowered sodium intake, excess water intake, brain disorders where ADH secretion is abnormal).

C. Total Iron Binding Capacity

Normal values, for both sexes, is 300 to 360 mcg/dl.

Iron is transported in the plasma bound to transferrin. Total iron-binding capacity (TIBC) is the total amount of iron that can be carried in the plasma by transferrin. Normally transferrin is one-third (30-40%) saturated and thus the serum iron levels are one-third the level of the total iron-binding capacity.
TIBC levels greater than 400 mcg/dl indicate iron deficiency. Levels are also elevated with pregnancy, hypoxia, blood loss and hepatitis.

Decreased levels occur in conditions of iron overload (hemochromatosis, frequent transfusions), infection, malnutrition, protein-losing enteropathies, liver cirrhosis, thalassemia, uremia, rheumatoid arthritis, neoplasms and nephrosis.

LABORATORY TESTS FOR MINERAL STATUS

A. Sodium

Normal values are reported to range from 135 to 155 mEq/L.

It is difficult to find nutritional significance in serum levels. Body content of sodium is not always reflected in serum levels. In conditions of water excess (renal failure, congestive heart failure, cirrhosis) serum sodium becomes diluted. In conditions of water insufficiency (diabetes insipidus, insufficient water intake) serum sodium becomes concentrated. True sodium depletion occurs in conditions of sodium loss (diarrhea, vomiting, renal failure with salt wasting, extreme sweating, and Addison’s disease).

B. Potassium

Normal values are reported to range from 3.5 to 5.5 mEq/L. Abnormally high values occur with hemolyzed blood.

Low levels occur in chronic renal failure, severe dehydration, shock and with excess intravenous potassium.

Potassium depletion occurs with inadequate intake and with loss of potassium-containing body fluids (diarrhea, vomiting, fistula, continuous suction). In muscle wasting and metabolic alkalosis potassium is lost from body cells and is excreted by the kidney. Excretion is increased by steroids and Cushing’s disease.

Serum potassium is not an accurate index of potassium status. Body cells may be depleted when serum levels are normal. Intracellular lack of potassium increases sensitivity to digoxin and cardiac arrhythmias.

Potassium is required along with nitrogen for replacement of lost muscle mass. Five mEq/gm amino acid nitrogen is recommended for optimal nitrogen retention. Each intravenous alimentation formula in this program provides for this requirement.

C. Chloride

Almost all dietary chloride occurs as sodium chloride. Normal values are reported to range from 95 to 105 mEq/L.

Conditions leading to sodium deficiency (excess sweating, diarrhea,
vomiting, etc) would likely produce a chloride deficiency. It is
difficult to relate chloride levels to nutritional status.

D. Calcium

The normal range is 8.5 to 11 mg/dl. Slightly lower values may occur
in late pregnancy. Higher values are found in children,
hyperparathyroidism, renal stones, hypercalcemia of infancy, and the
milk–alkali syndrome (high calcium and antacid intake).

Calcium absorption is decreased by phytate, oxalate, phosphate, fat
malabsorption and low protein diet.

E. Phosphorus

The normal range for adults is 2.5 to 4.5 mg/dl.

Abnormally high values occur if blood has hemolyzed. Elevated values
also occur with diabetes, renal disease, hyperparathyroidism, and
healing fractures.

Reduced values occur with rickets, insulin injections,
hyperparathyroidism, sprue, and celiac disease.

FREQUENCY OF CLINICAL MEASUREMENTS

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Initial Assessment</th>
<th>Follow-up assessment if abnormal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin/Transferrin</td>
<td>On admission</td>
<td>Every 14 days with diet</td>
</tr>
<tr>
<td>Anthropometrics</td>
<td>If required</td>
<td>Same</td>
</tr>
<tr>
<td>Body Weight</td>
<td>On admission</td>
<td>Daily</td>
</tr>
<tr>
<td>Creat. Right Index</td>
<td>On admission</td>
<td>Every 21-30 days</td>
</tr>
</tbody>
</table>

CHEMISTRIES

<table>
<thead>
<tr>
<th></th>
<th>Initial</th>
<th>1st wk</th>
<th>Bi wk</th>
<th>Tri wk</th>
<th>Weekly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>x</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Potassium</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Chloride</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Carbon dioxide</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>BUN</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Blood sugar</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Phosphate</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td>x</td>
<td></td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Albumin</td>
<td>x</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>24hr urine creat</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
</tbody>
</table>
Urine Urea Nitrogen
Spot Urinary Sodium, x
Potassium, Osmolarity

During periods of metabolic instability clinical measurement should be monitored under the first week schedule and continue until TPN administration has been stabilized at a new goal rate.
APPENDIX C

A. The patient record is 128 characters (bytes) long with the following structure:

- **Code**: 1 character
  - A(Active), N(Everused), D(ischarge), D(E)lete

- **Patient Identification**: 11 character
  - Usually the Social Security Number

- **Hospital Identification**: 8 character
  - Hospital admission number

- **Name**: 20 characters

- **Sex**: 1 character
  - M or F

- **Race**: 5 character
  - Cauc, Black, etc.

- **Age**: 2 character
  - Expressed to the nearest year

- **Height**: 4 byte field single precision number

- **Weight**: 4 byte field single precision number

- **Admission weight**: 4 byte field single precision number

- **Wrist circumference**: 4 byte field single precision number

- **Arm circumference**: 4 byte field single precision number

- **Triceps skin fold**: 4 byte field single precision number

- **Stress factor**: 4 byte field single precision number

- **Activity factor**: 4 byte field single precision number

- **Nutrition formula**: 2 character field formula number

- **Date**: 8 character field as YYMMDD

The following laboratory values are all 4 byte single precision number fields.

- Sodium
- Potassium
- Chloride
- Carbon dioxide
- Calcium
- Albumin
B. The formulae in the program are as follows:

1. Standard Central Alimentation D-25, 1020 Kcal/L

   Dextrose 250 gm/L
   Amino Acids 42.5gm/L
   Sodium 50 mEq
   Chloride 47 mEq
   Acetate 26 mEq
   Calcium 6 mEq
   Magnesium 8 mEq
   Phosphate 15 mM
   Vitamin solution 5 ml
   Trace element solution 1 ml

2. Standard Peripheral Alimentation D-10, 450 Kcal/L

   Dextrose 100 gm/L
   Amino Acids 27.5gm/L
   Sodium 50 mEq
   Chloride 41 mEq
   Acetate 17 mEq
   Calcium 6 mEq
   Magnesium 6 mEq
   Phosphate 15 mM
   Vitamin solution 5 ml
   Trace element solution 1 ml

3. Standard Peripheral Protein Sparing D-5, 280 Kcal/L

   Dextrose 50 gm/L
   Amino Acids 27.5gm/L
   Sodium 50 mEq
   Chloride 41 mEq
   Acetate 17 mEq
   Calcium 6 mEq
   Magnesium 6 mEq
   Phosphate 15 mM
   Vitamin solution 5 ml
   Trace elements 1 ml

4. The vitamin solution for each 5 ml consists of:

   Ascorbic Acid 50 mg
   Vitamin A 1650 IU
   Vitamin D 100 IU
   Thiamine 1.5 mg
   Riboflavin 1.8 mg
   Pyridoxine 2.0 mg
   Niacinamide 20 mg
<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dexpanthenol</td>
<td>7.5 mg</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>5 IU</td>
</tr>
<tr>
<td>d-Biotin</td>
<td>30 mcg</td>
</tr>
<tr>
<td>Folic Acid</td>
<td>200 mcg</td>
</tr>
<tr>
<td>Vitamin B-12</td>
<td>2.5 mcg</td>
</tr>
</tbody>
</table>

5. The Trace Element Solution for each ml consists of:

<table>
<thead>
<tr>
<th>Element</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zinc Chloride</td>
<td>1.0 mg</td>
</tr>
<tr>
<td>Copper Chloride</td>
<td>0.4 mg</td>
</tr>
<tr>
<td>Manganese Chloride</td>
<td>0.1 mg</td>
</tr>
<tr>
<td>Chromium Chloride</td>
<td>4.0 mcg</td>
</tr>
</tbody>
</table>
FILE CODE A=ACTIVE, D=DISCHARGE

PATIENT ID# 11 CHARAC
HOSPITAL ID # 8 CHARAC
PATIENT NAME 20 CHARA
SEX
HEIGHT IN CM 4BYTE SING PREC
USUAL WT IN KG 4BYTE SING PREC
ADMISSION/EVAUL WT 4BYTE S.P.
WRIST CIRCUM IN CM 4BYTE
ARM CIRCUM IN CM 4BYTE SP
TRICEPS SKINFOLD IN MM 4BYTE
STRESS FACTOR CHARAC
ACTIVITY FACTOR 2 CHAR
AGE IN YR 4BYTE
RACE CAUC, BLACK, ETC
NUTRITION FORMULA 2 BYTE
CURRENT DATE
SODIUM LEVEL MEQ/DL 4BYTE
POTASSIUM LEVEL 4 BYTE
CHLORIDE LEVEL 4 BY
CARBONATE LEVEL 4 BY
CALCIUM LEVEL 4 BY
ALBUMIN LEVEL 4 BY
BLOOD UREA NITROGEN LEVEL 4 BY
BLOOD GLUCOSE LEVEL 4 BY
TOTAL THERAPY ACCUMULATOR 2BY
4 BYTE FILLER TO 128 BYTE RECORD

NUTRITIONAL FILE DEFINITIONS

NUTRITIONAL FORMULA NUMBER (KEY)
AMINO ACID CONCENTRATION
CARBOHYDRATE CONCENTRATION
SODIUM CONCEN MEQ/L
CHLORIDE ION CONCENTRATION
ACETATE ION CONCEN.
CALCIUM ION CONC
MAGNESIUM CONCENTRATION
PHOSPHATE CONCEN
VITAMIN SOLUTION VOLUME
LIQUID DESCRIPTION LINE
FORMULA HEADER LINE

ANTHROPOMETRIC VALUES NOT EXPLAINED EASILY

PERCENT OF NORMAL FAT STORES
PERCENT OF NORMAL ARM MUSCLE CIRCUMFERENCE
ARM MUSCLE CIRCUMFERENCE
PERCENT OF NORMAL ARM MUSCLE CIRCUMFERENCE
RATIO OF HEIGHT(CM) TO WRIST CIRCUM(CM)

PARENTERAL NUTRITION FORMULA DEVELOPMENT MAIN MENU
USES ANTHROPOMETRIC MEASUREMENTS OR ESTIMATES TO DEVELOP
APPROPRIATE PARENTERAL/ENTERAL FORMULAE AND ROUTE

DRIVER.BAS,A

FILES: PATNUT.DAT PATIENT FILE; NUTFRM.DAT FORMULA FILE
LAST DEBUS 06-DEC-84
INPUT " ENTER CURRENT DATE AS YYYYMMDD NUMERICALLY:";CDAT$
PRINT " PARENTERAL NUTRITION DEVELOPMENT"
PRINT " INPUT THE NUMBER OF YOUR CHOICE."
PRINT:
PRINT " 1. INITIAL SET-UP OF THE FILE SYSTEM"
PRINT " 2. INPUT A NEW PATIENT TO THE DATABASE"
PRINT " 3. UPDATE A CURRENT PATIENT"
PRINT " 4. DELETE, DISCHARGE, OR BROWSE THE"
PRINT " PATIENT OR FORMULA DATABASE"
PRINT " 5. END THE SESSION"
INPUT CHOICE$
CHOICE% = VAL(CHOICE$)
IF CHOICE% = 5 THEN CLS: PRINT "RETURNING TO THE SYSTEM";
FOR X% = 1 TO 2000:NEXT X%; SYSTEM
ON CHOICE% GOSUB 370, 2530, 600, 1020
GOTO 210
END
' INITIALIZATION OF THE DATA FILES
' INIT.BAS AND INSTFOR.BAS
' WRITTEN 16-NOV-84
CLS: INPUT " IS THIS THE FIRST TIME FOR THIS SYSTEM? (Y OR N):"; AN$
IF AN$ = "N" OR AN$ = "n" THEN 490 ' FILES ALREADY BUILT RETURN
PRINT " WHICH FILE DO YOU WISH TO INITIALIZE."
PRINT " 1. PATIENT"
PRINT " 2. FORMULA"
PRINT " 3. SESSION FINISHED"
INPUT CHOICE%: IF CHOICE% < 1 OR CHOICE% > 3 THEN BEEP: GOTO 400
IF CHOICE% = 1 THEN GOSUB 12080: CLS: GOTO 420
IF CHOICE% = 2 THEN GOSUB 11290: CLS: GOTO 420
RETURN ' TO THE MAIN MENU
OPEN ROUTINE FOR PATNUT.DAT
OPEN "R",#1,"PATNUT.DAT",128
FIELD #1, 1ASF1$, 11ASF2$, 8ASF3$, 20ASF4$, 1ASF5$, 4ASF6$, 4ASF7$, 4ASF8$, 4ASF9$, 4ASF10$, 4ASF11$, 4ASF12$, 4ASF13$, 2ASF14$, 5ASF15$, 1ASF16$, 8ASF17$, 4ASF18$, 4ASF19$, 4ASF20$, 4ASF21$, 4ASF22$, 4ASF23$, 4ASF24$, 4ASF25$, 2ASF26$, 4ASF27$
RETURN ' TO OPEN PATIENT FILE CALL
OPEN ROUTINE FOR FORMULA.DAT
OPEN "R",#2,"FORMULA.DAT",128
FIELD #2, 1ASF1$, 4ASF2$, 4ASF3$, 20ASF4$, 2ASF5$, 2ASF6$, 2ASF7$, 2ASF8$, 2ASF9$, 1ASF10$, 1ASF11$, 50ASF12$, 55ASF13$
RETURN ' TO OPEN FORMULA FILE CALL
UPDATE A PATIENT UPDAT.BAS,A
LAST DEBUG 13-NOV-84
CLS
INPUT "PATIENT'S NAME:"; NAM$
INPUT "PATIENT'S I.D. NUMBER:"; PATID$
GOSUB 500
' OPEN PATNUT.DAT FILE CHANNEL #1
' FIND THE RECORD
GOSUB 15500
' HASH THE KEY
GOSUB 10800
' READ THE RECORD # REC%
TEMP$ = LEFT$(PCODE$, 1)
IF (TEMP$ = "A" OR TEMP$ = "D") AND PATID$ = PPATID$ THEN 830
REC% = REC% + 1
IF REC% > FILESIZE + (.5 * FILESIZE) THEN 780
GOTO 720
END OF FILE
CLS
PRINT " RECORD NOT FOUND FOR:"; PATID$, NAM$
PRINT " IF PATIENT I.D. IS CORRECT THIS IS A NEW PATIENT"
CLS
PRINT "A READMISSION, MAKING ACTIVE":CLOSE #1:FOR K%= 1 TO 2000:NEXT K%
GOSUB 2530 : GOTO 1010    'REINSTATEMENT REQUIRES NEW DEMOGRAPHICS
CLS
PRINT "NAME ":;NAM$;TAB(10)"PAT. I.D. ":;PPATID$; TCODE$ = PCODE$
PRINT:PRINT:FOR I% = 1 TO 1000: NEXT I% " PAUSE TO READ SCREEN
GOSUB 4910   'GET CURRENT LAB VALUES
GOSUB 6200   'COMPARE PREVIOUS VALUES TO CURRENT
GOSUB 8760   'WRITE REPORT
CODE$ = TCODE$
CODE$ = TCODE$
GOSUB 10190 'SWAP CODE TO WRITE TO FILE
GOSUB 10190 'WRITE UPDATE TO FILE
CLOSE #1
RETURN   'RETURN TO MAIN MENU
EDITALL.BAS,A
' TO EDIT PATIENT OR FORMULA FILE
' ALLOWS DELETION, DISCHARGE, OR BROWSING OF THE FILE
' WRITTEN 15-NOV-84
CLS:PRINT " WHICH FILE DO YOU WISH TO EDIT"
PRINT " 1. PATIENT FILE"
PRINT " 2. FORMULA FILE"
PRINT " 3. RETURN TO MAIN MENU"
INPUT CHOICE$
IF CHOICE$ < 1 OR CHOICE$ > 3 THEN BEEP:GOTO 1070 'INPUT ERROR,START OVER
IF CHOICE$ = 3 THEN RETURN    'RETURN TO MAIN MENU
IF CHOICE$ = 2 THEN GOSUB 1330: GOTO 1070    ' GO GET FORMULA FILE
GOSUB 500
CLS: PRINT "INPUT WHICH ACTION"
PRINT " 1. DELETE A PATIENT"
PRINT " 2. DISCHARGE A PATIENT"
PRINT " 3. BROWSE THE FILE"
PRINT " 4. FINISHED RETURN"
INPUT CHOICE$ : IF CHOICE$ < 1 OR CHOICE$ > 4 THEN 1160   'ERROR LOOP
IF CHOICE$ = 1 OR CHOICE$ = 2 THEN 1310
IF CHOICE$ = 4 THEN CLOSE #:GOTO 1070    'RETURN TO EDIT MENU
 ' BROWSE THE PATIENT FILE
CLS: FOR REC% = 1 TO FILESIZE
GOSUB 10800
GOSUB 1860
NEXT REC%
GOTO 1160
'ILOOP BACK TO ACTION MENU
IF CHOICE$ = 1 THEN GOSUB 1600: GOTO 1160    'DELETE
IF CHOICE$ = 2 THEN GOSUB 1410: GOTO 1160    'DISCHARGE
 ' BROWSE THE FORMULA FILE
GOSUB 550    'OPEN FORMULA FILE
FOR Y% = 1 TO FORSIZE
GOSUB 11110
IF LEFT$(FFOOD$,I) = "N" THEN 1400
GOSUB 2190
NEXT Y%
CLOSE #2: RETURN
'MARK RECORD FOR DISCHARGE
INPUT " INPUT PATIENT I.D. XXX-XX-XXXX "; PATID$
INPUT " INPUT PATIENT NAME "; NAM$
 'HASH THE KEY
GOSUB 12500
GOSUB 10300
IF LEFT$(PPATID$,11) = PATID$ THEN 1510
REC% = REC% + 1
IF REC% > FILESIZE + (.3 * FILESIZE) THEN 1500
GOTO 1450
LPRINT "NAME: "; PNAM$; TAB(35)"I.D. #: "; PPATID$
LPRINT "NAME: "; PNAM$; TAB(35)"I.D. #: "; PPATID$
LPRINT "THIS RECORD IS BEING MARKED FOR DISCHARGE"
LPRINT "THIS DATE: "; CDAT$
LPRINT "THIS RECORD IS BEING MARKED FOR DISCHARGE"
LPRINT "THIS DATE: "; CDAT$
FOR J% = 1 TO 1000: NEXT J%: CODE$ = "D"
GOSUB 1800 'SWAP ROUTINE
GOSUB 10190 'WRITE THE RECORD RTN
RETURN 'TO DEL., DISCH, BROWSE RTN

MARK RECORD FOR DELETION
CLS: INPUT "INPUT PATIENT I.D. XXX-XX-XXXX: "; PATID$
INPUT "INPUT PATIENT NAME ": NAM$
GOSUB 13500 'HASH THE KEY
GOSUB 10800 'READ THE REC
IF LEFT$(PPATID$, 11) = PATID$ THEN 1730
REC% = REC% + 1
IF REC% = FILESIZE + (.3 * FILESIZE) THEN 1700
GOTO 1650
CLS
PRINT " END OF FILE, CHECK I.D. AND TRY AGAIN"
FOR J% = 1 TO 1000: NEXT J%: GOTO 1790
RETURN TO CALLER
CLS: LPRINT "NAME: "; PNAM$: TAB(35)"I.D. #: "; PPATID$: 'AUDIT TRAIL
LPRINT "RECORD IS BEING DELETED FROM DATA BASE"
LPRINT "THIS DATE: "; CDAT$
LPRINT "NAME: "; PNAM$: TAB(35)"I.D. #: "; PPATID$: PRINT "RECORD IS BEING DELETED"
PRINT "THIS DATE: "; CDAT$
FOR J% = 1 TO 1000: NEXT J% 'PAUSE TO READ SCREEN
CODE$ = "E": GOSUB 10500 'WRITE NULLS TO REC
GOSUB 10190 'WRITE RECORD TO FILE
RETURN 'GO BACK TO EDIT RTN
CLS: PRINT "RECORD #: "; REC% 'DISPLAY THE RECORD
CLS: PRINT "CODE (active), D(discharge), D(Edited)": PCODE$
CLS: PRINT "NAME ": PNAM$
CLS: PRINT "PATIENT I.D. ": PPATID$
CLS: PRINT "PATIENT HOSPITAL I.D. ": PHSPID$
CLS: PRINT "LAST UPDATE ": PDAT$
CLS: PRINT "SEX ": PSEX$
CLS: PRINT "PAGE ": PAGE$
CLS: PRINT "PLACE ": PPLACE$
CLS: PRINT "HEIGHT(CM) ": PGHT$
CLS: PRINT "USUAL WEIGHT (KG) ": PUSLWT$
PRINT: PRINT "PRESS ANY KEY TO CONTINUE"
IF INKEY$ = "" THEN 1982 ELSE IF INKEY$ = "Q" THEN REC% = FILESIZE + 1: GOTO 2180
PRINT "WRIST CIRCUIT (CM) ": PWTRIST
PRINT "ARM CIRCUIT (CM) ": PARM
PRINT "TRICEPS SKIN FOLD (MM) ": PTRICPS
PRINT: PRINT "PRESS 'C' TO CONTINUE, 'Q' TO QUIT"
IF INKEY$ = "" THEN 2018 ELSE IF INKEY$ = "Q" THEN REC% = FILESIZE + 1: GOTO 2180
PRINT "STRESS FACTOR ": PSF
PRINT "ACTIVITY FACTOR ": PACTIVITY$
PRINT "NUTRITION FORMULA ": PF
PRINT "LABORATORY VALUES"
PRINT "SODIUM "; PNA$: TAB(30)"POTASSIUM "; PK
PRINT "CHLORIDE "; PCL$: TAB(30)"CARB DIOX "; PDO2
PRINT "CALCIUM "; PCA$: TAB(30)"ALBUMIN "; PALB
PRINT "MIN "; PMIN$: TAB(30)"GLUCOSE "; PGLU
IF INKEY$ = "." THEN 2120 ELSE IF INKEY$ = "Q" THEN REC% = FILESIZE + 1:
GOTO 2180
RETURN

TO BROWSE FILE LOOP

FORMULA FILE BROWSE & EDIT

CLS: PRINT "RECORD #: "; Y%
PRINT " 1. CODE: 1=CENTRAL, 2=PERIPH, 3=PRO SPAR: "; FOODS$
PRINT " 2. AMINO ACIDS: "; SAA$
PRINT " 3. CARBOHYDRATE: "; SCHO$
PRINT " 4. SODIUM (MEQ): "; SMA$
PRINT " 5. CHLORIDE (MEQ): "; SCL$
PRINT " 6. ACETATE (MEQ): "; SAC$
PRINT " 7. CALCIUM (MEQ): "; SCA$
PRINT " 8. MAGNESIUM (MEQ): "; SMG$
PRINT " 9. PHOSPHATE (mM): "; SP04$
PRINT " 10. VITAMINS (ML): "; SVITE$
PRINT " 11. TRACE ELEM.(ML): "; STE$
PRINT " 12. LIPIDS: "; PRINT SFAT$
PRINT " 13. HEADER: "; PRINT SNOTE$
PRINT: INPUT "EDIT WHICH FIELD 1-13, 0 TO CONTINUE: "; FLD$
FLD% = VAL(FLD$)

IF FLD% = 0 THEN 2510 'GET NEXT RECORD
ON FLD% GOTO 2380, 2390, 2400, 2410, 2420, 2430, 2440, 2450, 2460, 2470, 2480, 2490, 2500

INPUT "CODE: "; FOODS$: GOTO 2200
INPUT "AMINO ACIDS: "; SAA$: GOTO 2200
INPUT "CARBOHYDRATE: "; SCHO$: GOTO 2200
INPUT "SODIUM (MEQ): "; SMA$: GOTO 2200
INPUT "CHLORIDE (MEQ): "; SCL$: GOTO 2200
INPUT "ACETATE (MEQ): "; SAC$: GOTO 2200
INPUT "CALCIUM (MEQ): "; SCA$: GOTO 2200
INPUT "MAGNESIUM (MEQ): "; SMG$: GOTO 2200
INPUT "PHOSPHATE (mM): "; SP04$: GOTO 2200
INPUT "VITAMINS (ML): "; SVITE$: GOTO 2200
INPUT "TRACE ELEM.(ML): "; STE$: GOTO 2200
LINE INPUT "LIPID DISCR (MAX 50 CHARACTERS): "; SFAT$: GOTO 2200
LINE INPUT "HEADER DISCRIP. (MAX 55 CHARACTERS): "; SNOTE$: GOTO 2200
GOSUB 11930 'WRITE TO FILE
RETURN 'RETURN TO EDIT MENU

' PATIENT DEMOGRAPHICS BEGINING OF NEW PATIENT INPUT
PIDEM:9AS, ASCII
LAST DEBUG 07-NOV-84

GOSUB 2650 'GET SUBJECTIVE INPUT
GOSUB 3760 'GET ANTHROPOMETRIC INPUT
GOSUB 4180 'GET STRESS FACTORS
GOSUB 4910 'INPUT OF LAB VALUES
GOSUB 6640 'CALCULATION OF DEFICENCIES
GOSUB 7230 'DETERMINE ROUTE OF ADMINISTRATION
GOSUB 7710 'PRINT REPORT
GOSUB 9810 'ADD PATIENT TO DATABASE
RETURN

CLS: TOTAL.THERAPY% = 0
PRINT "SUBJECTIVE INPUT ": PRINT:PRINT
LINE INPUT "PATIENT'S NAME ": NAM$
INPUT "PATIENT I.D. # AS XXX-XX-XXXX ": PATID$
INPUT "PATIENT HOSPITAL I.D. #: "; HOSPID$
INPUT "AGE IN YEARS ": AGE$
INPUT "SEX ( M OR F ) ": SEX$
INPUT "RACE ( CAUC, BLACK, ASIAN, ETC ) ": RACE$
INPUT "DATE ( IN NUMBERS AS YYMMDD ) ": DAI$
INPUT "HEIGHT IN INCHES ": HGHT$
INPUT "ACTUAL WEIGHT IN POUNDS ": ADWT$
INPUT "USUAL WEIGHT IN POUNDS ": USLWT$
INPUT "WEIGHT LOSS IN POUNDS ": WLOS$
INPUT "DURATION OF WEIGHT LOSS IN DAYS ": DURLOS$
CLS
PRINT "1. NAME";"$NAM$
PRINT "2. PATIENT (SSN) I.D.";"$PATID$
PRINT "3. HOSPITAL I.D.";"$HOSPID$
PRINT "4. AGE";"$AGE$
PRINT "5. SEX";"$SEX$
PRINT "6. RACE";"$RACE$
PRINT "7. HEIGHT IN INCHES";"$Hght$
PRINT "8. ACTUAL WEIGHT";"$ADWT$
PRINT "9. USUAL WEIGHT";"$USLWT$
PRINT "10. WEIGHT LOSS";"$WTLOS$
PRINT "11. DURATION OF LOSS";"$DURLOS$
INPUT "EDIT WHICH FIELD (1-11, 0 TO CONTINUE)";"$FLD$
$FLD$ = VAL($FLD$)
IF $FLD$ = 0 THEN GOTO 3240
PRINT: PRINT
ON $FLD$ GOTO 3000,3020,3040,3060,3080,3100,3120,3140,3160,3180,3200
LINE INPUT "NAME";"$NAM$
GOTO 2830
INPUT "PATIENT I.D. #";"$PATID$
GOTO 2830
INPUT "HOSPITAL I.D.";"$HOSPID$
GOTO 2830
INPUT "AGE";"$AGE$
GOTO 2830
INPUT "SEX";"$SEX$
GOTO 2830
INPUT "RACE";"$RACE$
GOTO 2830
INPUT "HEIGHT IN INCHES";"$Hght$
GOTO 2830
INPUT "ACTUAL WEIGHT";"$ADWT$
GOTO 2830
INPUT "USUAL WEIGHT";"$USLWT$
GOTO 2830
INPUT "WEIGHT LOSS";"$WTLOS$
GOTO 2830
INPUT "DURATION OF LOSS";"$DURLOS$
GOTO 2830
'CHANGE TO UPPER CASE
UC$ = $NAM$; GOSUB 3690; $NAM$ = UC$
UC$ = $SEX$; GOSUB 3690; $SEX$ = UC$
UC$ = $RACE$; GOSUB 3690; $RACE$ = UC$
AGE = VAL($AGE$
Hght = VAL($Hght$
ADWT = VAL($ADWT$
USLWT = VAL($USLWT$
WTLOS = VAL($WTLOS$
DURLOS = VAL($DURLOS$
Hght = Hght * 2.54
USLWT = USLWT / 2.2046
WTLOS = WTLOS / 2.2046
ADWT = ADWT / 2.2046
'CONTINUE WITH THE SUBJECTIVE DATA
CLS
LINE INPUT "NUTRITIONAL HISTORY (ONE LINE)";"$NUTHX$
LINE INPUT "DIAGNOSIS (MAJOR AND SUPPORTING MINOR)";"$DX$
LINE INPUT "RELEVANT MEDICAL HISTORY (ONE LINE)";"$MEN$
CLS
CLS
PRINT "1. NUTRITIONAL HISTORY"; NUTHX$
PRINT "2. DIAGNOSIS (MAJOR & MINOR)"; DX$
PRINT "3. RELEVANT MEDICAL HISTORY"; MEdHX$
PRINT "4. IS THIS THE CORRECT DATE?"; DAT$
INPUT " WHICH FIELD TO EDIT (1-4, 0 TO CONTINUE):"; FLD$
FLD%= VAL(FLD$)
IF FLD% = 0 THEN GOTO 3640
ON FLD% GOTO 3560, 3580, 3600, 3620
LINE INPUT " NUTRITIONAL HISTORY"; NUTHX$
GOTO 3470
LINE INPUT " DIAGNOSIS (MAJOR/ MINOR)"; DX$
GOTO 3470
LINE INPUT " RELEVANT MEDICAL HISTORY"; MEdHX$
GOTO 3470
LINE INPUT " DATE AS YYMMDD IN NUMBERS"; DAT$
GOTO 3470
UC$ = NUTHX$: GOSUB 3690: NUTHX$ = UC$  " CHANGE INPUT TO UPPERCASE
UC$ = DX$: GOSUB 3690: DX$ = UC$  " TO
UC$ = MEdHX$: GOSUB 3690: MEdHX$ = UC$  " UPPERCASE
' TRANSLATE TO UPPER CASE
FOR X% = 1 TO LEN(UC$)
IF ASC(MID$(UC$, X%, 1)) < 97 THEN 3740
CD% = ASC(MID$(UC$, X%, 1)) - 32
UC$ = LEFT$(UC$, X% - 1) + CHR$(CD%) + MID$(UC$, X% + 1, 255)
NEXT X%
RETURN
' ANTHRO.BAS, ASCII
' REM ANTHROPOMETRIC MEASUREMENT INPUT
' LAST DEBUG 12-NOV-84
CLS
PRINT " ANTHROPOMETRIC MEASUREMENT INPUT SECTION"";
PRINT : PRINT
INPUT "UNITS OF MEASUREMENT: INCHES(1), METRIC(2), NOT DONE(3)"; WAY$
WAY$ = VAL(WAY$): IF WAY$ < 1 AND WAY$ > 3 THEN 3790
ON WAY$ GOTO 3850, 4060, 4090
INPUT " WRIST CIRCUMFERENCE:"; WRIST$
INPUT " ARM CIRCUMFERENCE:"; ARM$
INPUT " TRICEPS SKIN FOLD:"; TRICPS$
' CORRECTION ROUTINE
' CONVERSION RTN STRING TO NUMERIC
' CONVERT FROM ENGLISH TO METRIC MEASUREMENTS
' MEASUREMENTS IN METRIC
' NO MEASUREMENTS TAKEN, ESTIMATED FRAME SIZE DETERMINES VALUES
GOSUB 4660
WRIST = WRIST * 2.54
WRIST = INT(WRIST * 10 + .5) / 10
ARM = ARM * 2.54
ARM = INT(ARM * 10 + .5) / 10
TRICPS = TRICPS * 25.4
TRICPS = INT(TRICPS * 10 + .5) / 10
GOTO 4160
' MEASUREMENTS IN METRIC
' NO MEASUREMENTS TAKEN, ESTIMATED FRAME SIZE DETERMINES VALUES
JAY = 12: UNK = 2

" IF FRAME IS ESTIMATED UNK = 2, NOW DETERMINE THE IDEAL WEIGHT

IF SEX$ = "F" THEN GOSUB 4520 ELSE GOSUB 4350
RETURN

CLS:PRINT " INPUT STRESS FACTORS: FACTORS"
PRINT " 1. MINOR OPERATION 1.2"
PRINT " 2. SKELETAL TRAUMA 1.35"
PRINT " 3. MAJOR SEPSIS 1.6"
PRINT " 4. SEVERE BURNS 1.9"
INPUT STRES$
CLS:PRINT " INPUT ACTIVITY FACTORS"
PRINT " 1. CONFINE TO BED 1.2"
PRINT " 2. AMBULATORY 1.3"
INPUT ACTIVITY$
STRESS = VAL(STRES$)
ACTIVITY = VAL(ACTIVITY$)
TOTAL STRESS = STRESS * ACTIVITY
RETURN

MALE ANTHROPOMETRIC CALCULATIONS

IF UNK = 2 THEN 4410
ARM1 = ARM / .293
TRICPS = TRICPS / .125
CIRCM = ARM - .314 * TRICPS
CIRCM1 = CIRCM / .253
JAY = HGHT / WRIST
ESTIMATION OF IDEAL WEIGHT FROM ESTIMATED FRAME SIZE
IF JAY > 10.4 THEN IDLWT = ((HGHT - 155) * .675) + 50:
   IF JAY >9.6 THEN IDLWT = ((HGHT - 155) * .719) + 53.6:
      IF JAY >9.6 THEN IDLWT = ((HGHT - 155) * .794) + 58.2:
         IF JAY >9.6 THEN IDLWT = ((HGHT - 155) * .875) + 63:
RETURN

FEMALE ANTHROPOMETRIC CALCULATIONS

IF UNK = 2 THEN 4580
ARM1 = ARM / .285
TRICPS = TRICPS / .165
CIRCM = ARM - .314 * TRICPS
CIRCM1 = CIRCM / .253
JAY = HGHT / WRIST
IF JAY > 11 THEN IDLWT = ((HGHT - 142) * .622) + 41.8:
   IF JAY >10.1 THEN IDLWT = ((HGHT - 142) * .643) + 45:
      IF JAY >9.6 THEN IDLWT = ((HGHT - 142) * .67) + 49.5:
RETURN

BM = 655.1 + ((.60 * IDLWT) + (1.85 * HGHT) + (4.68 * AGE))
BM = INT(BM + .5)
RETURN

CORRECTION ROUTINE FOR WRIST ARM AND TRICEPS INPUT
CLS
PRINT " 1. WRIST CIRCUMFERENCE ": WRIST$
PRINT " 2. ARM CIRCUMFERENCE ": ARM$
CLS
FLD% = VAL(FLD$)
PRINT : PRINT
IF FLD% = 0 THEN RETURN
ON FLD% GOTO 4760, 4820, 4870
INPUT " WRIST CIRCUMFERENCE "; WRIST$
GOTO 4690
INPUT " ARM CIRCUMFERENCE "; ARM$
GOTO 4690
INPUT " TRICEPS SKIN FOLD "; TRICPS$
GOTO 4690
PRINT
' CONVERSION ROUTINE
WRIST = VAL(WRIST$)
ARM = VAL(ARM$)
TRICPS = VAL(TRICPS$)
RETURN
' LABIN.BAS.ASC1I
' LABORATORY INPUT
' LAST DEBUG 07/11/91
CLS: PRINT " INPUT MOST RECENT LABORATORY VALUES, IF ANY"
PRINT " TEST NOT DONE INPUT ZERO (0) FOR THE VALUE."
PRINT: PRINT " SERUM ELECTROLYTES"
PRINT
INPUT " SODIUM "; NA$
INPUT " POTASSIUM "; K$
INPUT " CHLORIDE "; CL$
INPUT " CARBON DIOXIDE "; CO2$
INPUT " CALCIUM "; CA$
INPUT " PHOSPHATE "; PO4$
GOSUB 4220
' CORRECTION ROUTINE
CLS: PRINT " URINE ELECTROLYTES":PRINT
INPUT " SODIUM "; UNA$
INPUT " POTASSIUM "; UK$
INPUT " CHLORIDE "; UCL$
GOSUB 4490
' CORRECTION ROUTINE
CLS: PRINT " OTHER PHYSIOLOGICAL MEASUREMENTS"
INPUT " ALBUMIN "; ALB$
INPUT " TOTAL PROTEIN "; TPRO$
INPUT " BUN "; BUN$
INPUT " GLUCOSE "; GLU$
INPUT " RUGULARITY "; DSMO$
INPUT " SERUM CREATININE "; CREAT$
INPUT " TOTAL IRON BIND. CAP."; TIBC$
INPUT " 24 HOUR URINE CREAT. "; UUN$
GOSUB 5870
' CORRECTION ROUTINE
GOSUB 5990
' CONVERT FROM STRING TO NUMERIC
RETURN
' RETURN FROM GOSUB 4000 IN PTDEM3
CLS
PRINT " 1. SODIUM "; NA$
PRINT " 2. POTASSIUM "; K$
PRINT " 3. CHLORIDE "; CL$
PRINT " 4. CARBON DIOXIDE "; CO2$
PRINT " 5. CALCIUM "; CA$
PRINT " 6. PHOSPHATE "; PO4$
INPUT " EDIT WHICH FIELD (1-6, 0 TO CONTINUE) "; FLD$
FLD% = VAL(FLD$)
IF FLD% = 0 THEN RETURN
PRINT: PRINT
GOSUB 4000, 4010, 4020, 4030, 4040, 4050, 4060
5400  GOTO 5220
5410  INPUT " CHLORIDE "; CL$
5420  GOTO 5220
5430  INPUT " CARBON DIOXIDE "; CO2$
5440  GOTO 5220
5450  INPUT " CALCIUM "; CA$
5460  GOTO 5220
5470  INPUT " PHOSPHATE "; PO4$
5480  GOTO 5220
5490  
5500  ' CORRECTION ROUTINE FOR URINE ELECTROLYTES
5510  
5520  CLS
5530  PRINT " 1. SODIUM "; UNA$
5540  PRINT " 2. POTASSIUM "; UK$
5550  PRINT " 3. CHLORIDE "; UCL$
5560  INPUT " EDIT WHICH FIELD (1-3, 0 TO CONTINUE) "; FLD$
5570  FLD% = VAL(FLD$)
5580  IF FLD% = 0 THEN RETURN
5590  PRINT: PRINT
5600  ON FLD% GOTO 5610, 5630, 5650
5610  INPUT " SODIUM "; UNA$
5620  GOTO 5490
5630  INPUT " POTASSIUM "; UK$
5640  GOTO 5490
5650  INPUT " CHLORIDE "; UCL$
5660  GOTO 5490
5670  
5680  ' CORRECTION ROUTINE FOR OTHER PHYSIOLOGICAL MEASUREMENTS
5690  
5700  CLS
5710  PRINT " 1. ALBUMIN "; ALB$
5720  PRINT " 2. TOTAL PROTEIN "; TP$
5730  PRINT " 3. BUN "; BUN$
5740  PRINT " 4. GLUCOSE "; GLU$
5750  PRINT " 5. OSMOLARITY "; OSMO$
5760  PRINT " 6. CREATININE "; CREAT$
5770  PRINT " 7. TOTAL IRON BIND. CAP. "; TIBC$
5780  PRINT " 8. 24 HOUR URINE CREAT. "; UUN$
5790  INPUT " EDIT WHICH FIELD (1-8, 0 TO CONTINUE) "; FLD$
5800  FLD% = VAL(FLD$)
5810  IF FLD% = 0 THEN RETURN
5820  ON FLD% GOTO 5830, 5850, 5870, 5890, 5910, 5930, 5950, 5970
5830  INPUT " ALBUMIN "; ALB$
5840  GOTO 5670
5850  INPUT " TOTAL PROTEIN "; TP$
5860  GOTO 5670
5870  INPUT " BUN "; BUN$
5880  GOTO 5670
5890  INPUT " GLUCOSE "; GLU$
5900  GOTO 5670
5910  INPUT " OSMOLARITY "; OSMO$
5920  GOTO 5670
5930  INPUT " SERUM CREATININE "; CREAT$
5940  GOTO 5670
5950  INPUT " TOTAL IRON BIND. CAP. "; TIBC$
5960  GOTO 5670
5970  INPUT " 24 HOUR URINE CREAT. "; UUN$
5980  GOTO 5670
5990  
6000  ' CONVERT FROM STRING TO NUMERIC
6010  
6020  NA = VAL(NA$)
6030  K = VAL(K$)
6060 CA = VAL(CA$)
6070 PO4 = VAL(PO4$)
6080 UNA = VAL(UNA$)
6090 UK = VAL(UK$)
6100 UCL = VAL(UCL$)
6110 ALB = VAL(ALB$)
6120 TPRO = VAL(TPRO$)
6130 BUN = VAL(BUN$)
6140 GLU = VAL(GLU$)
6150 OSMO = VAL(OSMO$)
6155 IF OSMO = 0 THEN OSMO = (NA*2) + (BUN/3) + (GLU/20): OSMO = INT(OSMO + .5)
6160 CREAT = VAL(CREAT$)
6170 TIBC = VAL(TIBC$)
6180 UUN = VAL(UUN$)
6190 RETURN
6200 ' CURRENT PATIENT UPDATE
6210 ' CURUPDAT.BAS.A
6220 ' LAST DEBUG 19-NOV-84
6230 CLS: INPUT "CURRENT WEIGHT IN POUNDS ": CURWT$: IF CURWT$ = "0" THEN 6275
6240 CURWT = VAL(CURWT$): CURWT = CURWT / 2.2046 ' CHANGE TO KGS
6250 IF CURWT > PADWT THEN DWL$ = "WEIGHT INCREASE"
6260 IF CURWT = PADWT THEN DWL$ = "NO WEIGHT INCREASE"
6270 CURWT = INT(CURWT * 100 + .5) / 100: PADWT = CURWT
6275 NEWA% = 0: TOTAL.THERAPY% = CVI(PNOTE$)
6280 IF K < PK THEN
6285 SLK$ = "DECREASE IN SERUM POTASSIUM, CONSIDER ADDITIONAL POTASSIUM"
6290 IF K = PK THEN SLK$ = "POTASSIUM LEVELS REMAINING CONSTANT"
6295 IF K > PK AND K <= 5! THEN
6300 SLK$ = "POTASSIUM INCREASING TO NORMAL RANGE"
6305 IF K > 5! THEN
6310 SLK$ = "POTASSIUM ABOVE NORMAL, CONSIDER Restricting INTAKE"
6315 IF NA < PNA THEN
6320 SLNA$ = "SODIUM LEVEL DECREASING, CONSIDER OVER HYDRATION"
6325 IF NA = PNA THEN SLNA$ = "SODIUM LEVEL REMAINING CONSTANT"
6330 IF NA > PNA AND NA <= 150 THEN
6335 SLNA$ = "SODIUM LEVELS INCREASING OR ARE NORMAL"
6340 IF NA > 150 THEN
6345 SLNA$ = "SODIUM LEVELS ABOVE NORMAL, CONSIDER DEHYDRATION"
6350 IF ALB < PALB THEN
6355 SLAB$ = "DECREASING ALBUM LEVELS, REDUCTION IN PROTEIN SYNTHESIS"
6360 IF ALB = PALB THEN SLAB$ = "NORMAL OR INCREASING ALBUMIN LEVELS"
6365 IF CA = PCA THEN
6370 SLCA$ = "DECREASING CALCIUM LEVELS, CONSIDER ADDITIONAL CALCIUM"
6375 IF CA > PCA THEN SLCA$ = "CONSTANT SERUM CALCIUM LEVELS"
6380 IF CA > 10.5 THEN SLCA$ = "NORMAL CALCIUM LEVELS"
6385 IF CA < 10.5 THEN SLCA$ = "CAUTION HYPER-CALCEMIA"
6390 IF CL < PCL THEN
6395 SLCL$ = "DECREASING CHLORIDE LEVELS, WATCH FOR ALKALOSIS."
6400 IF CL < 105 THEN
6405 IF CL > 105 THEN
6410 SLCL$ = "CHLORIDE LEVELS INCREASING TO NORMAL."
6415 IF CL < 105 THEN
6420 IF CL > 105 THEN SLCL$ = "CAUTION PATIENT ACIDOTIC, CONSIDER ADDITION OF ACETATE ION."
6425 IF CO2 < PCO2 THEN
6430 SLCO2$ = "DECREASING BICARBONATE LEVELS, WATCH FOR ACIDOSIS."
6435 IF CO2 = PCO2 THEN SLCO2$ = "CONSTANT SERUM BICARBONATE LEVELS"
6440 IF CO2 > PCO2 THEN SLCO2$ = "INCREASING TO NORMAL CO2 LEVELS."
6445 IF BUN < BUN THEN
6450 IF BUN > 10 AND BUN < 20 THEN SBUN$ = "NORMAL BUN",
IF GLU < PGLU THEN
SGLU$ = "DECREASING BLOOD GLUCOSE, INCREASE CARBOHYDRATE INTAKE."

IF GLU = PGLU THEN SGLU$ = "CONSTANT BLOOD GLUCOSE LEVELS"

IF GLU > PGLU AND GLU < 110 THEN
SGLU$ = "INCREASING TO NORMAL BLOOD GLUCOSE LEVELS."

IF GLU > 150 THEN
SGLU$ = "CAUTION: HYPERGLYCEMIA, CONSIDER ADDITION OF INSULIN."

INPUT " NEW ANTHROPOMETRIC MEASUREMENTS? (Y OR N)"; AN$.

IF AN$ = "Y" OR AN$ = "y" THEN GOSUB 3760: GOSUB 6820:
GOSUB 7450: NEWX = -1: GOTO 6550: " SUB 3760 -> NEW ANTHRO INFO,
SUB 6820 -> NEW LAB CALC, SUB 7450 -> NEW NUTRITIONAL ROUTE,
FLAG = YR.

IDLWT = PUSLWT/AGE = VAL(PAGE$); HIGHT = PHTHGT; SEX$ = PSEX$.

IF SEX$ = "F" THEN GOSUB 4620 ELSE GOSUB 4640: " GET CURRENT BMR

IF TOTAL.THERAPY = 14 THEN FOOD$ = PFOD$: GOSUB 7640: " GET FORMULA

SWAP PREVIOUS ANTHRO INFO

WRIST = PWRR$: ARM = FARM; TRICPS = PTRICPS.

INPUT " NEW STRESS FACTORS? (Y OR N)"; AN$.

IF AN$ = "Y" OR AN$ = "y" THEN GOSUB 4180: GOTO 6590

STRESS = ACTIVITY = SWAP FROM PREVIOUS INFO

STRESS$ = PSTRESS$: ACTIVITY$ = PACTIVITY$: STRESS = VAL(STRESS$):
ACTIVITY = VAL(ACTIVITY$): TOTAL.STRESS = STRESS * ACTIVITY

SWAP OTHER INFO


IF HFOOD$ = "2" OR HFOOD$ = "3" THEN CK$ = "20" " K & G NITROGEN

20 CK$ = "40"

TOTAL.THERAPY = TOTAL.THERAPY + 1

NOTE$ = MKI$(TOTAL.THERAPY)

DAT$ = CDAT$

RETURN

"TO CURRUPDAT"

" LABCAL.BAS, ASCII"

" CALCULATION SECTION"

" DETERMINATION OF THE SEVERITY OF DEFICITS"

" % IDEAL WEIGHT, % USUAL WEIGHT, % WEIGHT LOSS"

" LAST DEBUG 07-NOV-84"

PCIDLTW = (ADWT / IDLWT) * 100 " % IDEAL WEIGHT

PCUSLWT = (ADWT / USLWT) * 100 " % USUAL WEIGHT

PCWTLDS = ((USLWT - ADWT) / USLWT) * 100 " % WEIGHT LOSS

PCIDLTW = INT(PCIDLTW * 100 +.5) / 100

PCWTLDS = INT(PCWTLDS * 100 +.5) / 100

PCUSLWT = INT(PCUSLWT * 100 +.5) / 100

EVALUATION OF WEIGHT CHANGES

IF PCWTLDS < 10 THEN WDEF$ = "MILD": GOTO 6840

IF PCWTLDS >= 10 AND PCWTLDS < 25 THEN WDEF$ = "MODERATE": GOTO 6840

WDEF$ = "SEVERE"

" FAT RESERVE ESTIMATION SECTION DERIVED FROM TRICPS SKINFOLD"

IF TRICP1 = 0 THEN FAT$ = "NOT AVAILABLE": GOTO 6920

IF TRICP1 >= 90! THEN FAT$ = "NORMAL": GOTO 6920

IF TRICP1 >= 80! AND TRICP1 < 90! THEN FAT$ = "MILD": GOTO 6920

IF TRICP1 = 70! AND TRICP1 < 80! THEN FAT$ = "MODERATE": GOTO 6920

IF TRICP1 < 70! THEN FAT$ = "SEVERE"

" MIDARM CIRCUMFERENCE CALCULATIONS, ESTIMATION OF LEAN MUSCLE MASS"

IF CIRCM1 = 0 THEN MUSL$ = "NOT AVAILABLE": GOTO 7020

IF CIRCM1 = 90! THEN MUSL$ = "NORMAL": GOTO 7020

IF CIRCM1 = 80! AND CIRCM1 < 90! THEN MUSL$ = "MILD": GOTO 7020

IF CIRCM1 = 70! AND CIRCM1 < 80! THEN MUSL$ = "MODERATE": GOTO 7020

IF CIRCM1 < 70! THEN MUSL$ = "SEVERE"
FACT IS CREATININE COEFFICIENT IN MG / KG IDEAL BODY WEIGHT
THAT IS EXPECTED TO BE EXCRETED IN 24 HOURS.

IF UUN = 0 THEN CH1$ = "NOT AVAILABLE"; CH1 = 0: GOTO 7100
IF SEX$ = "F" THEN FACT = 18 ELSE FACT = 23
IDLCR = IDLWT * FACT
CH1 = (UUN / IDLCR) * 100
IF CH1 < 90 THEN CH1$ = "LESS THAN NORMAL LEAN BODY MASS"
ELSE CH1$ = "NORMAL LEAN BODY MASS"

ALBUMIN MALNUTRITION COMPARISONS

IF ALB = 0 THEN DEFALB$ = "NOT AVAILABLE"; GOTO 7180
IF ALB >= 3.5 THEN DEFALB$ = "NO DEFICIENCY" ; GOTO 7180
IF ALB < 3.5 AND ALB >= 3 THEN DEFALB$ = "MILD" ; GOTO 7180
IF ALB < 3 AND ALB >= 2.1 THEN DEFALB$ = "MODERATE" ; GOTO 7180
IF ALB < 2.1 THEN DEFALB$ = "SEVERE"
CALCULATES NITROGEN BALANCE

CLS
INPUT "DAILY INTAKE OF PROTEIN IN GRAMS:"; PROIN
UUN = UUN / 100
N2BAL = (PROIN / 5.25) - (UUN + 4) ' GRAMS OF N2 +/- PER DAY
RETURN ' RETURN FROM GOSUB 6000 IN PTDMS3
ROUTE . BAS, A
DETERMINE ROUTE OF ADMINISTRATION
LAST DEBUG 16-NOV-84
CLS
B = 0
IF PLANILOS > 10 THEN B = B + 1
IF ALB < 3.5 AND ALB >= 2.1 THEN B = B + 1
IF ALB < 2.1 THEN B = B + 2
IF CHI < 90 THEN CHI$ = "LESS THAN NORMAL LEAN BODY MASS"
ELSE CHI$ = "NORMAL LEAN BODY MASS"

CALCULATES NITROGEN BALANCE

INPUT "DAILY INTAKE OF PROTEIN IN GRAMS": PROIN
UUN = UUN + 100
NGB = (PROIN / 6.25) - (UUN + 4) "GRAMS OF N2 +/- PER DAY"
RETURN "RETURN FROM GOSUB 6000 IN FTDENI"

ROUTE.BAS.A

Determine Route of Administration

LAST DEBUG 1A-NOV-84

CLS

B = 0

IF PCTLOS > 10 THEN B = B + 1

IF ALB < 3.5 AND ALB > 2.1 THEN B = B + 1

IF ALB < 2.1 THEN B = B + 1

INPUT "RECENT SURGERY OR CHEMOTHERAPY? (Y OR N)";ANS$ 
IF ANS$ = "Y" OR ANS$ = "N" THEN B = B + 1

INPUT "NUMBER OF DAYS PATIENT HAS NOT EATEN:"; NPO

IF NPO = 3 THEN NPO$ = "MODERATE"; B = B + 1

IF NPO = 6 THEN NPO$ = "SEVERE"; B = B + 2

INPUT "SEVERE ILLNESS LASTING THREE WEEKS OR LONGER (Y OR N)"; ANS$

IF ANS$ = "Y" OR ANS$ = "N" THEN B = B + 1

RETURN "RUN GREAT RATIO"

IF URODNA < 8 THEN B = B + 1

IF URODNA > 8 THEN GOSUB 7410; GOTO 7410 "BUT IMPAIRMENT GET FORMULA"

IF URODNA < 8 AND ALB < 5.5 THEN DEC = DEC + 0 "SEVERE NUTRITIONAL IMPAIRMENT"

DEC = DEC + 2; GOTO 7710

TOTAL THERAPY = TOTAL THERAPY + 1

RETURN "TO NEW PT OR UPDATE"

FORMULA_BAS.A

NUTRITIONAL IMPAIRMENT, DETERMINE APPROPRIATE

FORMULA AND ROUTE

LAST DEBUG 1A-NOV-84

CLS; DEC = 0

INPUT "IS THE G.I. TRACT FUNCTIONING? (Y OR N)"; ANS$

IF ANS$ = "Y" OR ANS$ = "N" THEN DEC = DEC + 1 "OUT WORKS NEED PRO SPAR RX"

DEC = DEC + 1

IF FAT$ = "SEVERE" THEN DEC = DEC + 3

IF CHI > 0 AND CHI < 60 THEN DEC = DEC + 3

IF ALB < 2.1 THEN DEC = DEC + 3

IF WIDEN$ = "SEVERE" THEN DEC = DEC + 3

IF CHI > 60 AND CHI < 90 THEN DEC = DEC + 2

IF ALB > 2.1 AND ALB < 3 THEN DEC = DEC + 2

IF DEC = 6 THEN DEC = DEC + 2

GOTO 7540

GET CENTER: FORMULA
IF (PCWTLOS <= 0 OR PCWTLOS >= 10) AND (NP2 >= 1 OR NP2 <= 3)
THEN FOOD$ = "J"; CK$ = "20"; "PROTEIN SPARING FORMULA"

GOSUB 550 "OPEN FORMULA.DAT FILE"

FOR YZ = 1 TO FSIZE
READ FORMULA REC YZ
IF LEFTS(FFOODS,1) = FOODS THEN 7690 "BLAST OUT"
NEXT YZ
CLOSE #2
RETURN
RETURN TO ROUTE.BAS

FRINIT.BAS.A
PRINT OUT A NEW PATIENT
WRITTEN 16-NOV-84

INPUT "SET PAPER TO TOP OF PAGE AND PRESS ENTER": GO$,
LC = 0 ; LPRINT; LPRINT; LPRINT; LC=LC + 3
LPRINT TAB(20) "NUTRITIONAL EVALUATION": LPRINT; LC = LC + 3
LPRINT LPRINT "EVALUATION DATE": ;DAT$ ; LPRINT
LPRINT "NAME": ; NAM$ ; TAB(20) "I.D.#": ; FATID$; LPRINT "HOSP ID": ; HOSPID$;
TAB(4) "RACE": ; RACE$
LPRINT LPRINT "AGE": ; AGE$ ; YEARS" ; TAB(24) "SEX": ; SEX$ ; LC = LC + 3
LPRINT LPRINT "ANTHROPOMETRIC MEASUREMENTS": LPRINT; LC = LC + 3
HWT = INT(HWT * 100 + .5) / 100: USLWT = INT((USLWT * 100 + .5) / 100)
ADWT = INT((ADWT * 100 + .5) / 100: WTLOSS = INT((WTLOSS * 100 + .5) / 100)
HEIGHT = INT(HEIGHT * 100 + .5) / 100: USUALWT = INT((USUALWT * 100 + .5) / 100)
LPRINT LPRINT "WEIGHT LOSS(KG)": ; ADWT; TAB(25) "WEIGHT LOSS(KG)": ; WTLOSS; LC = LC + 4
LPRINT LPRINT "DURATION OF WT LOSS(DAYS)": ; DURLOSS; LC = LC + 2
LPRINT LPRINT "OTHER MEASUREMENTS": LPRINT
LPRINT WREST(CM); ; WREST; TAB(20) "ARM(CM)": ; ARM; TAB(35) "TRICEPS(FM)": ; TRICEPS; LPRINT
LPRINT FFM$; LC = LC + 5
LPRINT LPRINT "CALCULATED VALUES": LC = LC + 3
PLWT = INT((PLWT * 100 + .5) / 100: PCBI; PLWT = INT((PCBI; PLWT * 100 + .5) / 100)
LPRINT TAB(5) "IDEAL WT(KG)": ; ADWT; LPRINT TAB(5) "% OF IDEAL WT": ; IDEAWT;
LPRINT TAB(5) "% OF USUAL WT": ; PCBI; USUALWT
LPRINT TAB(5) "WEIGHT LOSS": ; PTWTLOS; "WEIGHT DEFICIENCY": ; WDEFI;
LPRINT TAB(5) "ESTIMATION OF FAT RESERVES": ; FATR;
LPRINT TAB(5) "ESTIMATION OF LEAN MUSCLE MASS": ; MUSML;
LPRINT TAB(5) "ESTIMATION OF CREATININE/HEIGHT INDEX": ; CHI;
LPRINT TAB(5) "CALCULATION LEVEL AS AN ESTIMATION VALUES": ; SERVC;
LPRINT TAB(5) "NORMAL" ; ; NORM;
LPRINT TAB(5) "NUTRITIONAL BALANCE": ; NURBAL; TRMS; LPRINT
LPRINT TAB(5) "NUMBER OF DAYS OF NO FEEDING": ; NOFD;
LPRINT LPRINT "BUPPER": ; BUPPER
LPRINT LPRINT "DIAGNOSIS": LPRINT
LPRINT TAB(5) "STRESS FACTOR": ; STRESS; LC = LC + 1
LPRINT TAB(5) "ACTIVITY FACTOR": ; ACTIVITY; LC = LC + 1
LPRINT TAB(5) "TOTAL STRESS FACTOR": ; TOTALSTRESS; LC = LC + 1
LPRINT TAB(5) "ESTIMATED BASAL METABOLIC RATE IN KCAL PER DAY": ; BMR
LPRINT "CARBXY = BMR * TOTALSTRESS; CARBXY = INT(CARBXY * .5)"
LPRINT TAB(5) "ESTIMATED CALORIC NEEDS WITH STRESS FACTOR": ; CARBXY
LPRINT TAB(5) "FINAL RECOMMENDATION": ; FINAL.REC$; LC = LC + 5
LPRINT LPRINT "DIAGNOSIS": LPRINT
LPRINT "MEDICAL HISTORY": LPRINT
LPRINT TAB(5) "MEDICINE": LPRINT
LPRINT "NUTRITIONAL HISTORY": LPRINT
LPRINT TAB(5) "NUTRING": LPRINT
LPRINT LPRINT "LABORATORY DATA": LPRINT; LC = LC + 12
LPRINT "SODIUM": ; NLATAB(10) "POTASSIUM": ; K; LC = LC + 1
LPRINT "CHLORIDE": ; NLATAB(10) "CARB DIOX": ; CO2; LC = LC + 1
LPRINT "PHOSPHATE": ; NLATAB(5) "CALCIUM": ; Ca; LC = LC + 1
LPRINT "OXY E760": LINERS PER PAGE SUS FORCES TOP OF PAGE
LPRINT "PHOS: LC = LC + 1"
TWO BYTE TOTAL RX ACCUMULATOR

RETURN

' NULL BAS,A
' NULL AND ZERO RECORD ROUTINE
' FOR FILLING LAST RECORD IN THE
' FILE
'
PATID$ = ""
HOSPID$ = ""
NAME$ = ""
SEX$ = ""
HEIGHT = 0
USLWT = 0
APWT = 0
AIRST = 0
ARM = 0
TRICPS = 0
STRESS = 0
ACTIVITY = 0
GENDER = ""
RACE$ = ""
ADDID$ = "0"
CAT$ = ""
BR = 0
CD = 0
CA = 0
CH = 0
CUN = 0
CL = 0
CLN = 0
CLN$ = ""
RETURN

'READ RECORD ROUTINE
'RE = REINS.G
'
L = LAST DEBUG 12 NOV-84
SET ###, REC%2
PCODE$ = F1$
FRATID$ = F2$
PHOSPID$ = F3$
FNAM$ = F4$
SEX$ = F5$
PHEIGHT = CVS(F6$)
USLWT = CVS(F7$)
PWT = CVS(F8$)
PWT = CVS(F9$)
PARST = CVS(F10$)
PARM = CVS(F10$)
TRICPS = CVS(F11$)
STRESS = F12$
ACTIVITY$ = F13$
BR = F14$
CD = F15$
CUN = F16$
CLN = F17$

PAUSE
FCO2 = CVS(F21$)
FCA = CVS(F22$)
FALB = CVS(F23$)
FBUN = CVS(F24$)
FGLU = CVS(F25$)
PNOTE$ = F26$
BLANK$ = F27$
RETURN
* READ ROUTINE FOR FORMULA FILE
READFOR.BAS.A
* READFOR.BAS.A
GET #2, Y%
FFOOD$ = F1$
SAA$ = F2$
SCHO$ = F3$
SNA$ = F4$
SCL$ = F5$
SCA$ = F6$
SMG$ = F7$
SP04$ = F8$
SVITES$ = F10$
STE$ = F11$
SFAT$ = F12$
SNOTE$ = F13$
RETURN
INSTALL FORMULA FILE "FORMULA.BAS,A"
INSTR.BAC.A
* LAST DEBUG 17-NOV-81
CLS
OBSERV SPC.
OPEN FILE
Y% = Y% + 1
INPUT " ENTER FOOD CODE: 1, 2, 3 & ETC."; FFOOD$
INPUT " ENTER AMINO ACIDS:"; SAA$
INPUT " ENTER DEXTROSE IN GRAMS:"; SCHO$
INPUT " ENTER SODIUM:"; SNA$
INPUT " ENTER CHLORIDE:"; SCL$
INPUT " ENTER ACETATE:"; SCA$
INPUT " ENTER CALCIUM:"; SMG$
INPUT " ENTER Magnesium:"; SP04$
INPUT " ENTER VITAMINS IN ML:"; SVITES$
INPUT " ENTER TRACE ELEMENTS:";STE$
LINE INPUT" ENTER LIPID DESCRIPTION:"; SFAT$
LINE INPUT" ENTER HEADER DESCRIPTION:"; SNOTE$
CLS
PRINT 1. FOOD CODE : FFOOD$
PRINT 2. AMINO ACIDS : SAA$
PRINT 3. CARBOHYDRATE : SCHO$
PRINT 4. SODIUM : SNA$
PRINT 5. CHLORIDE : SCL$
PRINT 6. ACETATE : SCA$
PRINT 7. CALCIUM : SMG$
PRINT 8. MAGNESIUM : SP04$
PRINT 9. PHOSPHATE : SVITES$
PRINT 10. VITAMINS : SFAT$
PRINT 11. TRACE ELEMENTS : STE$
PRINT 12. LIPID DESCRIPTION (50 CHARACTERS) : SFAT$
PRINT 13. HEADER DESCRIPTION (50 CHARACTERS) : SNOTE$
INPUT " CHOOSE WHICH FIELD 1-13, ZERO TO CONTINUE:"; FLD$
LOC = FAL(FLD$)
1100  INPUT"FOOD CODE": FFOOD$: GOTO 11500
11100 INPUT"AMINO ACIDS": SAA$: GOTO 11500
11120 INPUT"CARBOHYDRATE": SCO$: GOTO 11500
11140 INPUT"SODIUM": SNA$: GOTO 11500
11160 INPUT"CHLORIDE": SCL$: GOTO 11500
11180 INPUT"ACETATE": SAC$: GOTO 11500
11200 INPUT"CALCIUM": SCA$: GOTO 11500
11220 INPUT"MAGNESIUM": SMG$: GOTO 11500
11240 INPUT"PHOSPHATE": SPO$: GOTO 11500
11260 INPUT"VITAMINS": SVITES$: GOTO 11500
11280 INPUT"TRACE ELEMENTS": STE$: GOTO 11500
11300 LINE INPUT"LIPID DESCRIPTION": SLIP$: GOTO 11500
11320 LINE INPUT"HEADER DESCRIPTION": SNOTE$: GOTO 11500
11340 ' WRITE RECORD TO DISK
11360 GOSUB 11900: PRINT" Record ": Y$: = " Y": ENTERED"
11380 INPUT" MORE ENTRIES? ( Y OR N)": Ans$
11400 IF Ans$ = "Y" OR Ans$ = "y" THEN 11370
11420 FOOD$: = "N": Y$: = "Y": + 1: GOSUB 11930
11440 'APPEND A BLANK RECORD
11460 CLEAR: PRINT" FORMULA FILE, FORMULA.DAT HAS BEEN INITIALIZED"
11480 CLOSE #2
11500 RETURN 'RETURN TO MAIN MENU
11520 ' WRITE ROUTINE FOR FORMULA FILE
11540 ' WRITE.BAS,A
11560 ' WRITTEN 17-NOV-84
11580 ' SET F1#: = FFOOD$
11600 ' SET F2$: = SAA$
11620 ' SET F3$: = SCO$
11640 ' SET F4$: = SNA$
11660 ' SET F5$: = SCL$
11680 ' SET F6$: = SAC$
11700 ' SET F7$: = SCA$
11720 ' SET F8$: = SMG$
11740 ' SET F9$: = SPO$
11760 ' SET F10$: = SLIP$
11780 ' SET F11$: = SVITES$
11800 ' SET F12$: = STE$
11820 ' SET F13$: = SLIP$
11840 ' SET F14$: = SNOTE$
11860 PUT #1, Y$.
11880 RETURN
11900 ' INSTALL PROGRAM INIT.BAS,A
11920 ' CODES USED FOR THE FILE ARE: N = NEVER USED
11940 ' A = ACTIVE
11960 ' D = DISCHARGED
11980 ' E = EXPIRED
12000 ' OPEN FILE
12020 GOSUB 5000
12040 CODE$: = "N": LSET F1#: = CODE$
12060 FILESPACE = FILESIZE + (1.3*FILESIZE)
12080 FOR REC% = 1 TO FILESPACE
12100 PUT #1, REC$
12120 NEXT REC$
12140 CLOSE #1
12160 PRINT" FATNUT.DAT HAS BEEN INITIALIZED"
12180 FOR J#: = 1 TO 2000: NEXT J#
12200 RETURN 'RETURN TO MAIN MENU
12220 ' APPEND A RECORD ROUTINE
12240 ' IF RECORD SLOT OF HASH VALUE IS FILLED, LINEAR PROBE TO
12260 ' FIND RECORD OR FREE SPACE
12280 ' HASH THE KEY
12300 GOSUB 11500
12320 GOSUB 11800
12340 TEMP$: = LEFT$(FFOOD$, 1)
IF TEMP$ = "A" OR TEMP$ = "D" THEN REC% = REC% + 1: GOTO 15325
GOSUB 10190 "WRITE THE RECORD"
RETURN
' HASHING ROUTINE, CAT$ = CONCATINATION OF PATIENT ID#
' PATNUM IS SINGLE PRECISION NUM OF CAT$, RECNUM IS INTEGER VALUE
' OF HASH DIVISION
CAT$ = MID$(PATID$, 1, 3) + MID$(PATID$, 5, 2) + MID$(PATID$, 9, 4)
PATNUM = VAL(CAT$)
HASHVAL = FLSIZE - 1
RECNUM = PATNUM / HASHVAL
RECNUM = RECNUM - INT(RECNUM) "DECIMAL REMAINDER"
REC% = INT(HASHVAL * RECNUM) + 1 "INTEGER RECORD NUM"
RETURN