REPORT NO. 1105

ABDX -

A Decision Support System for the Management of Acute Abdominal Pain

USER'S MANUAL

by

D. Southerland and K. Fisherkeller

Naval Medical Research and Development Command
Research Work Unit M0095.005-5010

Released by:

C. A. HARVEY, CAPT, MC, USN
Commanding Officer
Naval Submarine Medical Research Laboratory

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Approved for public release; distribution unlimited

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Summary Page

PROBLEM:

To provide a user manual for the Acute Abdominal Diagnostic Program (ABDX) for use by a corpsman unfamiliar with computers.

FINDINGS:

The manual contains introductory information, a description of equipment needed, an overview of the different parts of the system, a list of definitions, a list of the treatment protocols, a simple tutorial, and a sample datasheet.

APPLICATION:

This manual will be useful as a user manual, enabling a corpsman unfamiliar with computers to use the decision support program without the need for supplementary training.

ADMINISTRATIVE INFORMATION

This investigation was conducted under Naval Medical Research and Development Command Research Work Unit M0095.005-5010. It was submitted for review on 25 August 1987 and approved for publication on 10 November 1987. It has been designated as Naval Submarine Medical Research Laboratory Report No. 1105.

Abstract

This user's manual is designed to accompany the ABDX system implemented on MS-DOS computers. The manual replaces the previous manual which was designed for use on the Tektronix 4051. The manual contains introductory information, a description of equipment needed, an overview of the different parts of the system, a list of definitions, a list of the treatment protocols, a simple tutorial, and a sample datasheet.

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1. INTRODUCTION

1.1 Historical Perspective

Medical evacuation from a patrolling nuclear submarine is costly in terms of risk to the patient, the expense of evacuation, and the compromise to the submarine's mission. The Independent Duty (8402) Corpsman must independently diagnose and manage any illness which presents at sea. He also must make recommendations regarding evacuations. His diagnostic task is often complicated by an inability to communicate with shore-based medical facilities and by the limited medical diagnostic facilities aboard nuclear submarines- a lack, for example, of x-ray facilities as well as many laboratory tests normally relied on in most hospitals and dispensaries ashore.

The first Abdominal Pain Diagnostic Program was developed for use on the Tektronix 4051 which was aboard most submarines. However, the corpsman had limited access to the machine on most submarines. Consequently he has not been able to use the system, and NSMRL[1] has not been able to properly evaluate it. To address the access problem (and to give the corpsman state of the art technology), NSMRL proposes that all submarines be provided with lap-sized IBM-PC compatible microcomputers equipped with the MS-DOS operating system. The program and this manual have been rewritten for use on such a system.

1.2 Purpose of the System

The Abdominal Pain Diagnostic Program is designed to aid the Independent Duty Hospital Corpsman in diagnosing and treating male patients who present with the chief complaint of acute abdominal pain. The program considers only the five most common causes of acute abdominal pain requiring medical evacuation as well as a sixth category, non-specific abdominal pain. It has thirty-seven questions which the corpsman answers by circling the correct responses on a specially designed data sheet while examining the patient or soon after the examination. The answers are entered into an IBM-compatible microcomputer which computes the probability for each of the diseases. The case is then stored so that, when convenient, the corpsman can recall it and print the patient's SF-600.

The program also contains treatment protocols for each of the diseases considered. The protocols are consistent with the materials and medication available aboard the submarine.

1.3 Program Design

The program has undergone several revisions during its development for use with the IBM-PC compatible microcomputers. The current version is written in

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1 Navy Submarine Medical Research Laboratory, Box 900, Subase New London, Groton, CT 06349-5900.

compiled BASIC using the Microsoft QuickBasic 3.0 compiler. The diagnostic portion is composed of a database containing information from almost 1000 cases of acute abdominal pain in patients similar in age and medical conditions to U.S. submariners. The algorithm and data base were developed under contract to NSMRL by Dr. F. T. deDombal at the University of Leeds, England.

1.4 Purpose of the Manual

The purpose of this manual is to train the corpsman in the use of the computer-based Abdominal Pain Diagnostic Program. It is assumed that the user already has the skills necessary to take the history and to perform the physical examination in the manner required by the program. The manual is written for the person with no prior experience with computers. The manual is written for the person with no prior experience with computers. Other than reading this manual, no other training is needed.

The manual is divided into six sections. Section 1 is the introduction. Section 2 describes the hardware and software needed to run the Abdominal Pain Diagnostic Program. Section 3 discusses the six abdominal pain diseases diagnosed by the program, when to use the program, and the abdominal pain data sheet. Section 4 gives an overview of the system. Section 5 describes the actual use of the program. Finally, Section 6 gives the treatment protocols for each of the diseases, the actual definitions, and full-size data sheet samples.

2. GETTING STARTED

2.1 Equipment Needed

To use this Abdominal Pain Diagnostic Program you must have the program, the manual, and a computer with the following characteristics:

2.1.1 The Computer

The computer must be an IBM PC or IBM PC compatible with an MS-DOS or PC-DOS version 2.0 or higher operating system.

The Abdominal Pain Diagnostic Program will not run on the Zenith-100 (Z-100 and Z-120) series microcomputers purchased by the US Navy over the past several years unless a special circuit board has been installed. Note that while the Z-100 series (without a special IBM-PC compatible adapter board) will not run the program, the Z-100 PC series computers will. As a general guide, Zenith computers with movable or detachable keyboards are IBM compatible; those with a keyboard which is an integral part of the computer chassis are not IBM compatible, unless they have been modified by the addition of an adapter circuit board. The easiest way to find out if a computer is IBM compatible is to ask someone who uses the computer.

2.1.2 Graphics Capability

The computer must have the color graphics adapter (CGA) or its equivalent. Most EGA (Enhanced Graphics Adapter) boards have a CGA mode. The computer does not have to have a color monitor. While this sounds contradictory, it is not, for many computers display color graphics on a monochrome monitor by using shades of gray to represent the different colors. Most IBM compatible computers have the color graphics capability even though they come with a monochrome monitor. Again, if you are confused, ask someone who is using the same computer.

2.1.3 Memory

Most IBM compatible microcomputers come with at least 512 kilobytes of random access memory (RAM), more than enough to use the program. No tests have been undertaken to determine the smallest memory needed to run the program.

2.1.4 The Printer

A printer is optional. Cases can be entered and stored without it. A printer is useful for making hard (printed) copies of written information displayed on the display screen or printing a case on an SF-600 for the patient's medical record. Some printers are hooked to the computers parallel port, and some are hooked to the serial port. The program will work with either. The printer output is directed though the parallel port unless you change it. If you have a serial printer, you will have to use the MS-DOS command, MODE, to redirect the output through the serial port. Be sure you connect the printer to the computer with the correct cable.

You can obtain hard copies of the information displayed on the computer screen by pressing the SHIFT key and the PRTSC key at the same time. However, you must load the GRAPHICS.COM program which came with the MS-DOS operating system disks before running the program, or "garbage" may be printed. The MODE.COM and GRAPHICS.COM programs will be found on the MS-DOS system disk and they must be in the default drive or in a directory or subdirectory referenced by the PATH command. Consult the MS-DOS user's manual or a local expert for more information on the PATH and MODE commands, the printing of graphics screens, and the GRAPHICS.COM program.

2.2 Disk Contents

The following files comprise the Abdominal Pain Diagnostic Program:

ABDX.EXE	H55.TXT	SETUP.DAT
ABHXSX.DAT	HELP.DAT	SHIP.DAT
ABPESX.DAT	HP00.DAT	SIMUL.DAT
AUTOEXEC.BAT	HP10.DAT	START.BAT
H14.TXT	HP11.DAT	SUBPIC.BIN

H15.TXT	HP12.DAT	TX1.DAT
H24.TXT	HP13.DAT	TX2.DAT
H25.TXT	HPT10.DAT	TX3.DAT
H34.TXT	HPT12.DAT	TX4.DAT
H35.TXT	HPT131.DAT	TX5.DAT
H44.TXT	REAL.DAT	TX6.DAT
H45.TXT	REMODE.COM	VIRALGI.PLN

2.3 Backups

A backup is a separately stored copy of all of the files (programs and data) on a disk.

2.3.1 Why Make Backups

Backups ensure that your programs and data are always available. If a disk is damaged, information may be lost. Damage can result from poor disk quality, disk age, heavy use, electrical "glitches" in the power supply, or other physical or electromagnetic forces. You WILL lose a program or data file in this manner eventually. You may also lose data or programs through operator error. This should not happen if you follow the procedures exactly as described in the manual. If a program or data is lost, you can quickly have the program running again if you maintain proper backups.

SOUTHERLAND'S RULE - All floppy disks will fail.
COROLLARY #1 TO SOUTHERLAND'S RULE- The probability of a disk failing is directly proportional to the length of time since the last backup was made, the time it took to enter the data on the disk, and the importance of the information on the disk.

2.3.2 When to Make Backups

When you first get the program disk (the disk containing all of the programs and data files), you should make several copies of the disk before you ever use it. Then you should place your original disk in a safe place. Always use one of your copies as your working disk. You should make frequent backups of the working disk. Remember that while the original disk contains all of the programs, it has no patient cases stored on it. There is no set time interval for making backups of the working disk. As a rule of thumb, make them often enough so that if the working disk is damaged, you will be able to re-enter the lost cases onto one of the backups in a timely manner. Also, if you will not be entering more data for some time, then make backups so that if the working disk fails, you will not have to try to remember what data you entered since the last backup was made. The number of backups that you make will depend on how valuable your data and time are. Generally two

backups of the working disk are enough. Store all three in different places if possible[2].

If you find that either the working disk or one of the backup disks is damaged, you should remove the damaged disk and insert an expendable disk which contains no valuable material. Using that disk, test the computer by listing the disk directory and copying unimportant programs from the expendable disk to itself. This is done to ensure that the computer or disk drive is not damaging the disks. If the computer or disk drive is at fault, do not use any programs or data on the computer until the computer is repaired. If the computer and disk drive show no faults, then remove the expendable disk and copy one of the program backup disks to a new disk. You should always have at least your minimum number of good copies of the program before using it. Do not use the old working disk for the backup; discard it. It is unreliable and it could fail again.

2.3.3 How to Make Backups

There are several ways to do this. The quickest way to copy a floppy disk to another floppy disk is to use the DISKCOPY command. Another method uses the COPY command. The exact command sequence for making backups will vary depending on what storage devices are connected to the computer.

Use the DISKCOPY command for copying from one floppy disk to another floppy disk. Do NOT use the DISKCOPY command to write to a hard drive or you will destroy all of the information already stored on the hard drive. Consult your computer's user manual for more detailed instruction on using the above commands. If you plan to store the program on a hard drive, use only the COPY/V command.

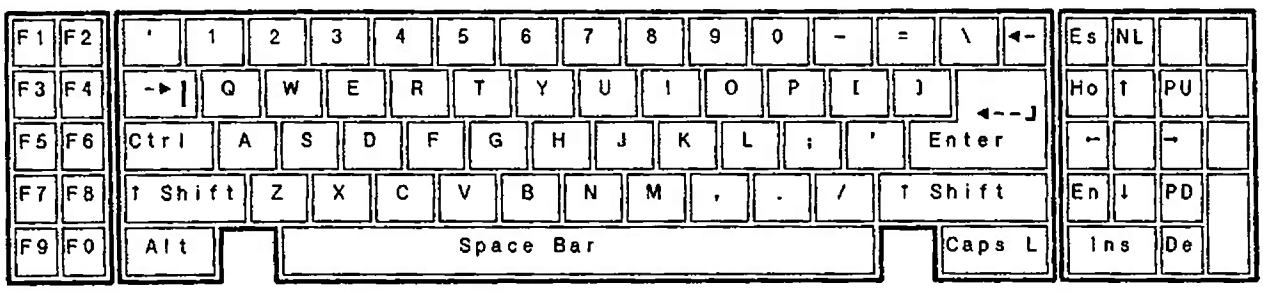


Figure 2-1 - A typical keyboard

[2] Your computer experience will be much more enjoyable if you will follow this advice for any program you use on the computer.

2.4 Important keys

To use the program effectively, you need to become familiar with several keys that are used often. The keys you can use are usually listed at the bottom of each display screen. The following is a short description of the use and possible locations for certain commonly used keys. If you cannot find the keys, consult your documentation for their location. A sample keyboard is shown in figure 2-1. Your keyboard may differ slightly.

Throughout this manual, the names of keys and commands used will be signified by enclosing them within double quotes. The double quotes marks themselves should not be typed.

2.4.1 Question Mark Key

The question mark key "?" is used to obtain help throughout the program. Help is available only on those display pages with instructions at the bottom of the screen mentioning the question mark key. When you press the question mark key while on one of the history and physical examination pages, you will be given the definition of the question in which the cursor is found.

2.4.2 Arrow Keys

These keys move the cursor in the appropriate direction. The cursor is a solid rectangle which marks your location in the text. The arrow keys are usually found on the smaller numeric keypad at the right of the main keyboard. To use these keys, you must first set the numeric keypad lock key "NumLock". This key is also in the smaller keypad. The "NumLock" key lets you change the keypad for the arrow keys and other special keys to numerals and back. Normally, the keyboard is set for the special key use when the computer is turned on, so unless you have used the keypad for numeric entry, the special keys will be selected. Some computers do not have a numeric keypad. If that is the case, consult the computer's user's manual for the locations and labels of the cursor movement keys.

2.4.3 Return/Enter

This is actually one key. On some computers it is labeled as "Return" and on others as "Enter". It is usually a large key on the right of the main typewriter keyboard. This key tells the computer that you are through typing and that the computer is to take the information that was just typed and use it in the program. This key is also used in the history and physical examination sections to select or de-select a response for the item high-lighted by the cursor. For the remainder of the manual this key will be represented by ENTER.

2.4.4 Tab

The "Tab" key is normally found in the same position as on a typewriter. In the data entry section of the Abdominal Pain Diagnostic Program, the "Tab" key has a

special function. When the key is pressed, the cursor will jump to the first item of the next question. If the cursor was originally on the last question of the display page, it will then jump to the first question of the page. This key will be represented by TAB.

2.4.5 Ctrl-Break

"Ctrl-Break" is accomplished by pressing simultaneously the "Ctrl" key and the "Break" key (often found on the same key as the "Scroll Lock" key). This sequence is used to abort the running program and is an inelegant way of exiting the program. You will be asked, "Do you desire to terminate a batch job?". Reply by pressing the "N" key. The screen will then be blanked and you will return to the MS-DOS prompt. The "Ctrl-Break" key will be represented by CTRL-BREAK.

2.4.6 PrtSc

The "PrtSc" key is usually located to the right of the keyboard. It is used to print the screen on the printer. Before you print screens, the printer should already be on and you must have run the GRAPHICS.COM program which comes with the operating system. Your printer must be one supported by the GRAPHICS.COM program. Check your operating system user's manual for further details. To print the screen on the printer, press the "PrtSc" key (usually you will have to press the "Shift" key at the same time). The "PrtSc" key will be represented by PRTSC.

2.4.7 Miscellaneous Keys

The letter keys "N", "P", and "X" are also used as command keys.

The "P" key is used to take you to the previous page in the same group of pages which may be ten pages long. If you are on the first page of the group, you will be returned to the menu from which you entered the group of pages.

The "N" key is used to take you to the next page in the same group of pages. If you are on the last page of the group, you will be returned to the menu from which you entered the group of pages.

The "X" key releases you from the page group and returns you to the menu from which you entered the group of pages.

2.5 Starting the Program

There are two main methods of starting the program. You can run the program either from a floppy disk or a hard drive.

NOTE: If you are told to <u>type</u> a word or phrase, just type the characters within the double quotes. If you are told to <u>enter</u> a word or phrase, type the word or phrase within the double quotes and then press the ENTER key.

2.5.1 Starting the Program from a Floppy Disk

If you are going to run the program from a floppy disk, first "boot" your computer in the usual manner using the computer's MS-DOS system disk. You may first have to enter the date and time, depending on the system You should then have the MS-DOS prompt which is usually "A" followed by ">" and a blinking cursor. If you have two drives, you can leave the system disk in drive A and place the Abdominal Pain Diagnostic Program disk in drive B. Enter "B:" at the prompt to change the default drive to B. Then enter "START". If you have only one floppy drive, you must remove the system disk from the default drive[3] (usually drive A), insert the program disk, and then enter "START".

Note: A floppy disk should never be inserted with force. If the disk cannot be inserted easily, try a second time. If this fails, try using a backup disk, preferably not your only backup disk.

2.5.2 Starting the Program from a Hard Drive

If you have a hard drive with enough room, create a sub-directory on the hard drive and then copy all of the files over to the sub-directory. If you do not know how to do this, get someone familiar with your machine to do it for you. After the files have been copied over to the hard drive, you no longer have to use the floppy disk to run the program. Simply select the sub-directory where the program files are contained and then enter "START". Consult your user's manual or someone familiar with the machine for more information if you are unclear about these directions. Save the floppy disk as a backup.

3. GENERAL ASPECTS OF THE ABDOMINAL PAIN MEDICAL SUPPORT PROGRAM

3.1 Diagnostic Categories

The diagnostic program is not intended to diagnose all causes of acute abdominal pain. Instead the program helps the corpsman to diagnose five serious causes of abdominal pain in males aged 17 to 70: Appendicitis (APPEND), Renal Colic (RCOLIC), Perforated Duodenal Ulcer (PERFDU), Cholecystitis (CHOLE), and Small Bowel Obstruction (SMBOBS). In addition, a sixth category, Nonspecific Abdominal Pain (NONSAP), is included to represent those entities which are non-surgical, not life-threatening, and, therefore, not reasons for medical evacuation.

[3] The default drive is the one that will be used if a disk command is used without specifying a particular drive. To determine the default drive, look at the main system prompt at the beginning of the line where you can type MS-DOS commands. It is usually in the form of an upper case letter followed by the greater than symbol and is found at the beginning of the line. "A>" is an example of the main system prompt and informs you that the default drive is drive A . If the default drive were drive B then the prompt would have the letter "B" in place of the letter "A" in the example above. If you do not desire to use the current drive, you can always change the default drive by typing at the main prompt the desired drive letter followed by a colon and then pressing <Enter>.

These categories encompass the vast majority of the causes of serious abdominal pain in the target population. A discussion of each diagnostic category is presented as a part of the corresponding treatment protocol which can be displayed from within the program. The treatment protocols are also printed in Appendix A.

3.2 When to use the Abdominal Pain Diagnostic Program

The Abdominal Pain Diagnostic Program is intended for use only with men aged 17 to 70, who are experiencing acute abdominal discomfort which has lasted less than 48 hours.

The computer stores information on the presentation of hundreds of cases of abdominal pain, rapidly sorts the data, performs statistical (Bayesian) analyses on it. However, the computer cannot think. You must rely on your clinical judgment and expertise in deciding when to use the program, and in making the final diagnosis. The program will only consider the 37 questions in diagnosing the patient. Massive hematemesis or a stab wound to the abdomen would have great impact on your diagnosis and treatment of the patient, but these would not be considered by the program in making its diagnosis. Therefore you must also rely on your clinical judgment and expertise in interpreting the results of the computer interaction just as you must interpret a pulse rate or mental status examination.

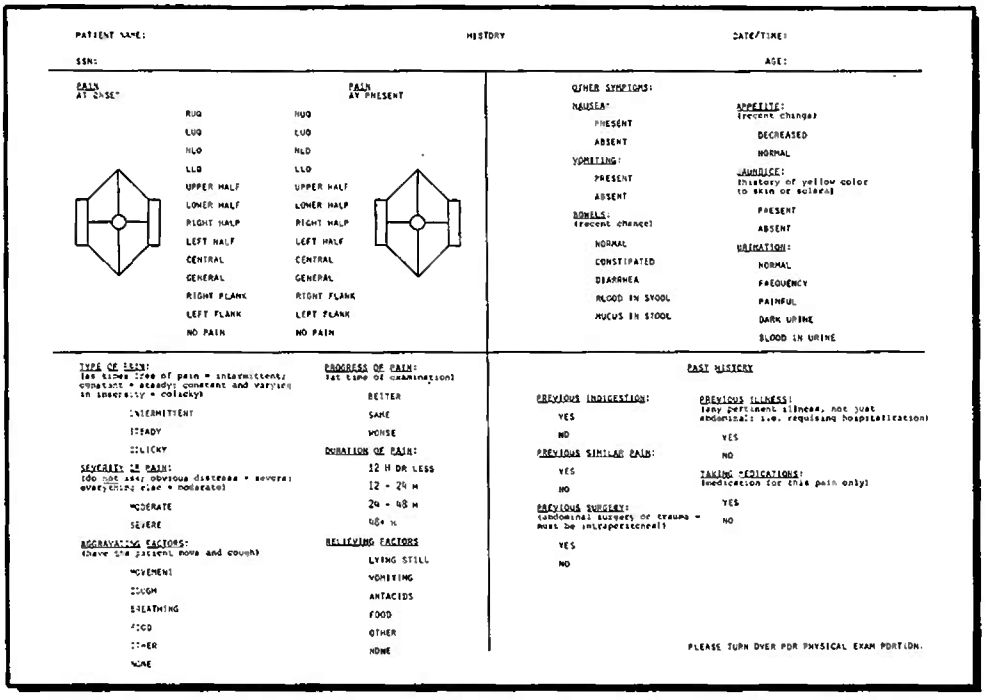
Use the system as a "second opinion". If the computer's diagnosis agrees with yours, then you will have more confidence in your decision. If the computer disagrees with your diagnosis, you should go back and reexamine the history and physical data, your references, and your own decision making process. If your final diagnosis still disagrees with the computer after you have reviewed the data, you will still be more confident in your diagnosis, since you should now be able to give some reasons why your diagnosis is correct.

3.3 Abdominal Pain Data Sheet

The abdominal pain data sheet provides you with a guide to use in performing the history and physical examination. It consists of 19 history categories (Figure 3-1) and 18 physical exam categories (Figure 3-2). The findings on these categories are used by the computer program to arrive at a diagnosis. When a patient presents with abdominal pain, you should first conduct a history and physical exam and record his findings on the abdominal pain data sheet. Later, you can transfer the information recorded on the data sheet into the computer. Full size copies can be found in Appendix C.

3.4 Symptom Category Definitions

The accuracy of the computer program depends on the accuracy of the data you collect. It is important for you to adhere to the program's standardized definitions and methods of data collection in completing the abdominal pain data sheet. All the information about the patient's condition, must be evaluated and entered into the program. The definitions of the symptoms are printed



PATIENT NAME: HISTORY DATE/TIME:

SSN: AGE:

PAIN AT ONSET / PAIN AT PRESENT

RUQ LUQ RLQ LLQ UPPER HALF LOWER HALF RIGHT HALF LEFT HALF CENTRAL GENERAL RIGHT FLANK LEFT FLANK NO PAIN

OTHER SYMPTOMS:

NAUSEA: PRESENT / ABSENT

VOMITING: PRESENT / ABSENT

BOWELS: (recent change) NORMAL / CONSTIPATED / DIARRHEA / BLOOD IN STOOL / MUCUS IN STOOL

APPETITE: (recent change) DECREASED / NORMAL

JAUNDICE: (history of yellow color to skin or sclera) PRESENT / ABSENT

URINATION: NORMAL / FREQUENCY / PAINFUL / DARK URINE / BLOOD IN URINE

TYPE OF PAIN: (as time freq of pain = intermittent; constant = steady; constant and varying in intensity = colicky) INTERMITTENT / STEADY / COLICKY

SEVERITY OF PAIN: (do not ask; obvious distress = severe; everything else = moderate) MODERATE / SEVERE

AGGRAVATING FACTORS: (have the patient move and cough) MOVEMENT / COUGH / BREATHING / FOOD / OTHER / NONE

PROGRESS OF PAIN: (at time of examination) BETTER / SAME / WORSE

DURATION OF PAIN: 12 H OR LESS / 12 - 24 H / 24 - 48 H / 48+ H

RELIEVING FACTORS: LYING STILL / VOMITING / ANTACIDS / FOOD / OTHER / NONE

PAST HISTORY

PREVIOUS INDIGESTION: YES / NO

PREVIOUS SIMILAR PAIN: YES / NO

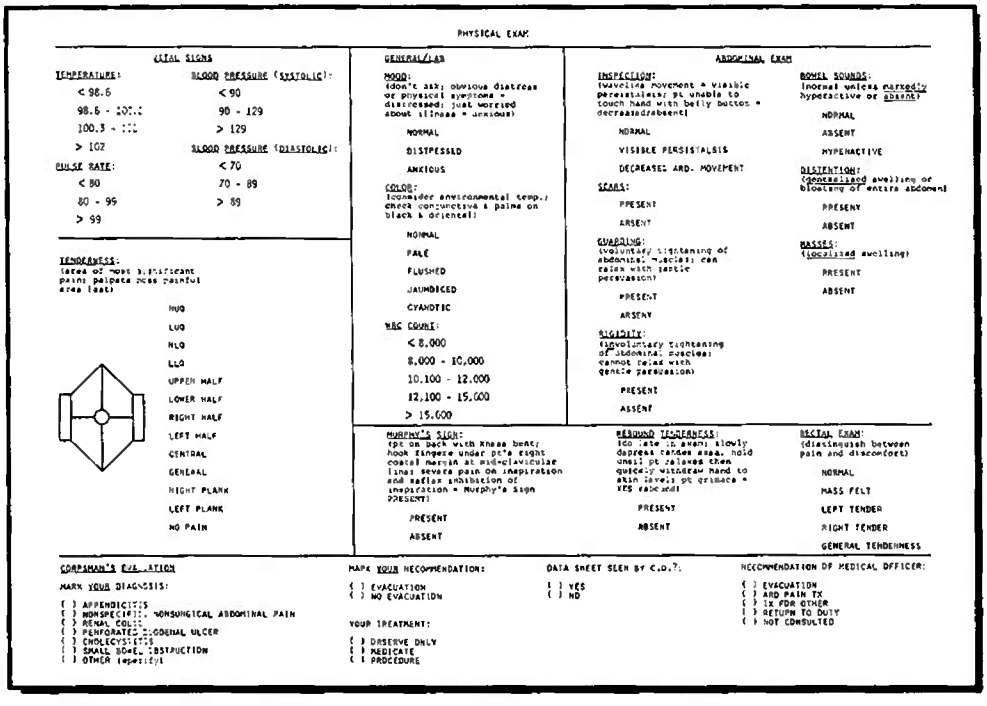
PREVIOUS SURGERY: (abdominal surgery or trauma - must be intraperitoneal) YES / NO

PREVIOUS ILLNESS: (any pertinent illness, not just abdominal; i.e. requiring hospitalization) YES / NO

TAKING MEDICATIONS: (medication for this pain only) YES / NO

PLEASE TURN OVER FOR PHYSICAL EXAM PORTION.

Figure 3-1 - The History portion of the Data Sheet



PHYSICAL EXAM

VITAL SIGNS

TEMPERATURE: < 98.6 / 98.6 - 100.2 / 100.3 - 102 / > 102

BLOOD PRESSURE (SYSTOLIC): < 90 / 90 - 129 / > 129

PULSE RATE: < 80 / 80 - 99 / > 99

BLOOD PRESSURE (DIASTOLIC): < 70 / 70 - 89 / > 89

TENDERNESS: (area of most significant pain; palpate most painful area last)

RUQ LUQ RLQ LLQ UPPER HALF LOWER HALF RIGHT HALF LEFT HALF CENTRAL GENERAL RIGHT FLANK LEFT FLANK NO PAIN

GENERAL/LAB

MOOD: (don't ask; obvious distress or physical symptoms = distressed; just worried about illness = anxious) NORMAL / DISTRESSED / ANXIOUS

COLOR: (consider environmental temp.; check conjunctiva & palms on black & orient) NORMAL / PALE / FLUSHED / JAUNDICED / CYANOTIC

WBC COUNT: < 8,000 / 8,000 - 10,000 / 10,100 - 12,000 / 12,100 - 15,000 / > 15,000

ABDOMINAL EXAM

INSPECTION: (wavelike movement = visible peristalsis; pt unable to touch hand with belly button = decreased/absent) NORMAL / VISIBLE PERISTALSIS / DECREASED ABD. MOVEMENT

SCARS: PRESENT / ABSENT

GUARDING: (voluntary tightening of abdomen; rectus can relax with gentle persuasion) PRESENT / ABSENT

RIGIDITY: (involuntary tightening of abdomen; rectus cannot relax with gentle persuasion) PRESENT / ABSENT

BOWEL SOUNDS: (normal unless markedly hyperactive or absent) NORMAL / ABSENT / HYPERACTIVE

DISTENTION: (generalized swelling or bloating of entire abdomen) PRESENT / ABSENT

MASSES: (localized swelling) PRESENT / ABSENT

MURPHY'S SIGN: (pt on back with knees bent; hook fingers under pt's right costal margin at mid-clavicular line; severe pain on inspiration and reflex inhibition of inspiration = Murphy's Sign POSITIVE) PRESENT / ABSENT

REBOUND TENDERNESS: (do late in exam; slowly depress tender area, hold until pt relaxes then quickly withdraw hand to skin level; pt grimace = YES rebound) PRESENT / ABSENT

RECTAL EXAM: (distinguish between pain and discomfort) NORMAL / MASS FELT / LEFT TENDER / RIGHT TENDER / GENERAL TENDERNESS

CORPSMAN'S EVALUATION

MARK YOUR DIAGNOSIS:

( ) APPENDICITIS
( ) NONSPECIFIC, NONSURGICAL ABDOMINAL PAIN
( ) RENAL COLIC
( ) PERFORATED DUODENAL ULCER
( ) CHOLECYSTITIS
( ) SMALL BOWEL OBSTRUCTION
( ) OTHER (specify)

MARK YOUR RECOMMENDATION:

( ) EVACUATION
( ) NO EVACUATION

YOUR TREATMENT:

( ) OBSERVE ONLY
( ) MEDICATE
( ) PROCEDURE

DATA SHEET SEEN BY C.O.?: ( ) YES ( ) NO

RECOMMENDATION OF MEDICAL OFFICER:

( ) EVACUATION
( ) ANP PAIN TX
( ) TX FOR OTHER
( ) RETURN TO DUTY
( ) NOT CONSULTED

Figure 3-2 - The Physical Exam portion of the Data Sheet

in Appendix B. If you want a definition of an item move the high-lighted bar to the item and type the "?" key.

4. ABDOMINAL PAIN DIAGNOSTIC PROGRAM MODULES

The program is divided into three primary modules: the main diagnostic module, the training module, and the SF-600 generation module. The main diagnostic module and the training module share some of the same display pages. These common pages will be described only once.

4.1 Overview of the Main Diagnostic Module

This module contains the actual diagnostic programming for both real cases and simulated cases.

4.1.1 Customization Page

The first time you run the program, you should be asked to enter the name of your boat, the boat's hull number, your name, and your SSN. These items are necessary later when the SF-600 is printed. This page will be displayed only if no information has been entered previously. If this page is not displayed, you should check the name of the submarine printed in the submarine drawing on the title page. If your boat name and hull number are not listed, you will need to exit the program and enter "DEL SHIP.DAT". Then restart the program by entering "START". You should then come to the customization page. You will probably see this page only once when you run the program for the first time. You can, however, change the boat or your name information by following the steps mentioned above.

To continue to the next display page, follow the directions at the bottom of the display screen and press any key. Throughout this program, directions can usually be found at the bottom of the screen.

4.1.2 The Title Page

The Title Page contains the name of the diagnostic program, the name and hull number of the boat for which the program has been customized, and the name, address, and phone number of the program developers (see Figure 4-1). Please send any questions about the Abdominal Pain Diagnostic Program to the Naval Submarine Medical Research Laboratory, Box 900, SUBASE NLON, Groton, CT 06349-5900.

4.1.3 The Disclaimer Page

The disclaimer page is displayed after the Title Page. This is a summary of the program and the statement that the corpsman's judgment always takes precedence over the computer's diagnosis when any doubt exists.

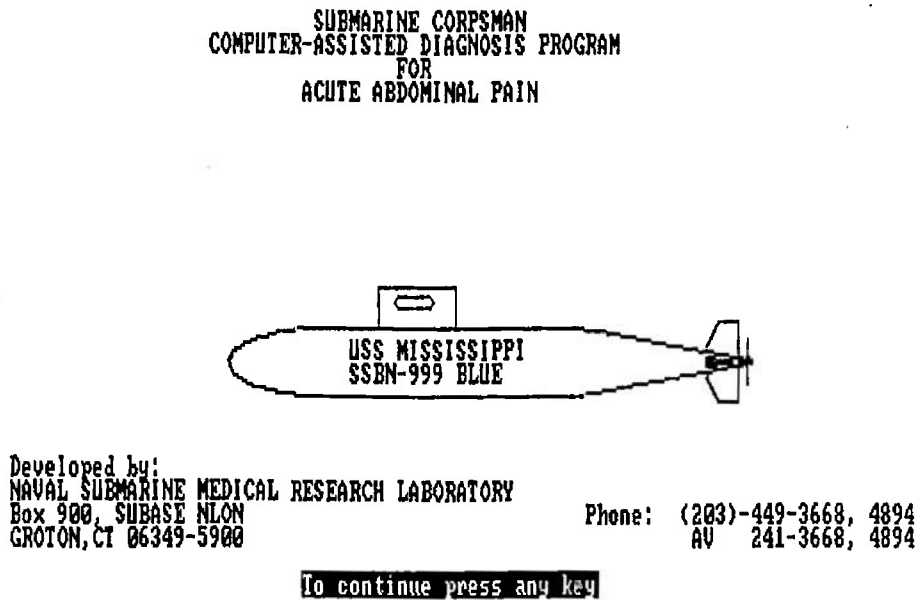


Figure 4-1 - The Title Page

4.1.4 The Main Option Page

The Main Option Page provides the user with 8 program options (see Figure 4-2). Move the cursor using the up or down arrow keys to the desired selection and then press ENTER to select an option. A brief description of each option can be obtained by typing the "?" key. The options are:

4.1.4.1 Real Case

Select this option if you have an actual patient that you want the computer to diagnose. NOTE- real cases are stored on the default disk so that the data you entered can be used to print out the SF-600 entry for the patient. Only real cases are stored in this manner, so anytime you have a real patient be sure to mark him as such.

4.1.4.2 Simulated Case

This runs an imaginary patient through the diagnostic section. If you want to try different responses to see how the probabilities vary with changes in the history or physical, use this option. This section differs from the training module in that

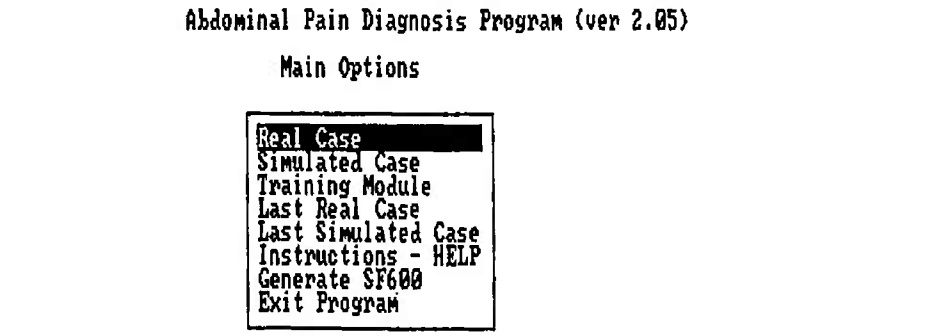


Figure 4-2 - The Main Option Page

you input the history and physical findings into the module in this section, whereas in the training module you are given a specific case to enter and diagnose Simulated case data cannot be used to print SF-600 medical record entries.

4.1.4.3 Training Program

Select this option if you want to practice on a training program. This program is for your own training, and no record is made of its use. It will first give you a patient narrative. Using this, you then can fill out a data sheet, make your diagnosis, enter the data into the computer, and then compare it to the computer derived diagnosis.

4.1.4.4 Last Real Case

This will put the latest real case into memory and allow you to review the responses given at the time. Also, if you have a real patient whom you are examining a second time because of a confusing or early presentation, you can call in the previous exam and update changes; you do not have to reenter all of the history and physical each time. Be sure to update the date and time of the new exam.

4.1.4.5 Last Simulated Case

This will put the last simulated case in memory. This allows you to come back to the previous simulated case at a later date and continue with simulation.

4.1.4.6 Instructions - HELP

This will give you more instructions for using the Abdominal Pain Diagnosis Program. This selection includes what keys to use and how to move around to different parts of the program.

4.1.4.7 Generate SF-600

This runs the SF-600 generation routine. If your computer does not have much installed memory and you have many memory-resident programs installed in the system, the routine may cause the computer to "crash" or "lock up" when you attempt to use it while in this program. If that happens, remove the memory-resident programs and restart the computer.

4.1.4.8 Exit Program

This ends interaction with the computer program. Always finish by selecting either this option or the End Interaction option on the Diagnostic Summary Page. Ending your interaction with the program in any other way risks both the loss of case data and damage to, or loss of, the program.

4.1.5 Data Entry Options Page

This is the master menu for the data entry section of the program. From this menu, you may select to answer questions on the history, physical examination, patient's age, date of the examination, or time of the examination.

4.1.5.1 Go To History Pages

This displays the 4 pages of history symptoms of the paper and pencil form of the abdominal pain datasheet. The first page is shown in Figure 4-3. In entering symptom data, follow the instructions listed at the bottom of the display screen.

4.1.5.1.1 Data Entry

To enter history symptoms into the computer, move the cursor to the desired response and press ENTER. Symptoms that have been entered into the computer are starred. Data do not need to be entered in order. You can move back and forth between categories on one page or on different pages.

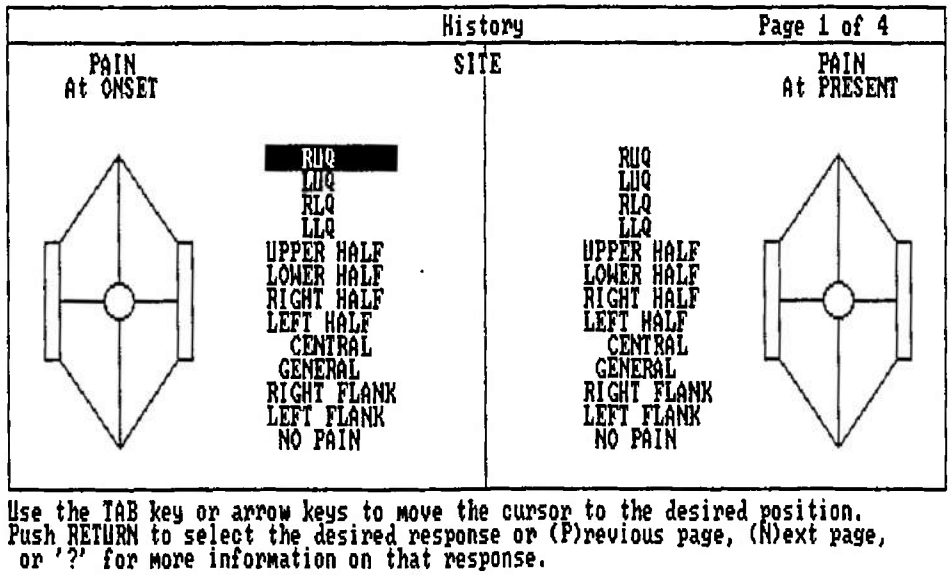


Figure 4-3 - Page 1 of History Section

4.1.5.1.2 Moving the Cursor

The position of the cursor is controlled by the arrow keys, by the letter keys (U)p, (D)own, (L)eft, (R)ight, and by the TAB key. The TAB key moves the cursor to the initial item under each symptom category.

4.1.5.1.3 Proceeding to Next or Previous Pages

Type "P" to return to the previous data sheet page. Type "N" to proceed to the next data sheet page. If you type "P" while on the first data sheet page or "N" while on the last data sheet page you will return to the previous menu.

4.1.5.1.4 Correcting Errors

Errors made in data entry can be corrected in one of two ways.

1. If the responses within a symptom category are mutually exclusive (only one answer is logically possible), move the cursor to the desired response and press ENTER. The symptom entered in error is removed and the desired response is

starred. Using this method with symptom categories where more than one response is possible will result in multiple entries.

2. Any symptom can be removed by re-entering it. Place the cursor on the symptom entered in error and press ENTER. The symptom is removed and no longer starred.

4.1.5.1.5 Definition of Symptom Categories

Definitions of symptom categories can be obtained by placing the cursor on the symptom in question and typing the "?" key. Pressing any key from within the definition section will return you to the data page.

4.1.5.2 Go to Physical Exam Pages

This takes you to the physical exam section of the abdominal pain datasheet. There are 4 pages of physical exam findings that correspond to the physical exam portion of the datasheet. The first page of the physical exam section is shown in Figure 4-4.

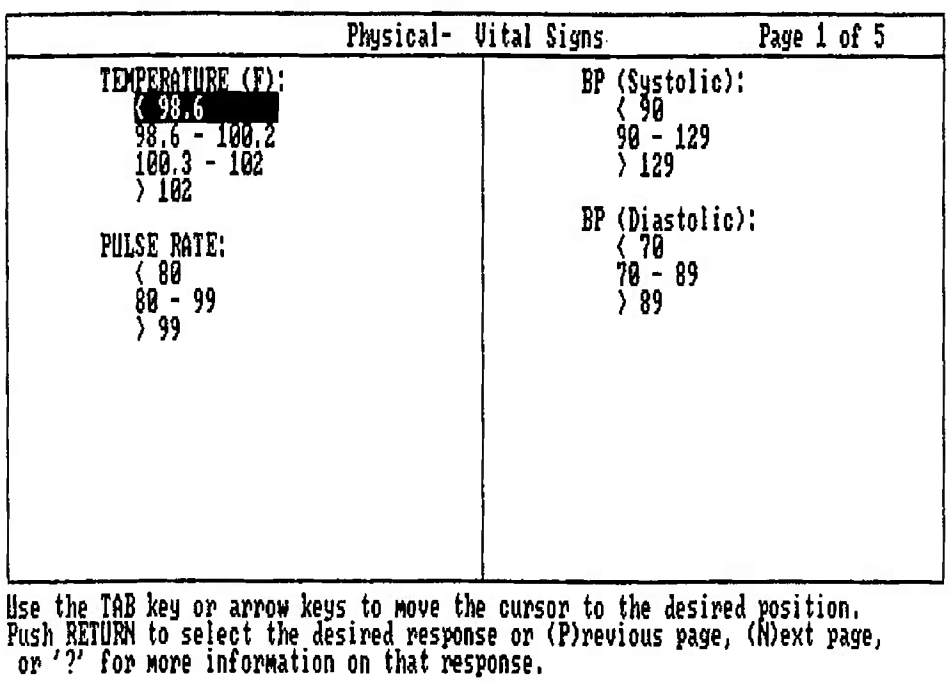


Figure 4-4 - First Page of Physical Exam Section.

To enter data, to move the cursor, to proceed to a different datasheet page, to correct errors and to obtain symptom definitions, follow the same rules outlined for entering history symptom data (4.1.5.1.1).

4.1.5.3 Make a Diagnosis

This produces a computer-generated diagnosis based on the symptom information entered into the computer. If the amount of information entered into the computer is insufficient for an accurate diagnosis, you will be asked to enter more history and physical exam data. Otherwise, proceed to the Corpsman's Diagnosis Page.

4.1.5.4 SSN/AGE/TIME Page

This changes the age or SSN of the patient, or updates the date or time of the evaluation of the patient from the values you entered initially.

4.1.5.5 Return to Main Option Page

This returns you to the Main Option Page if you accidentally came to the Data Entry Page by mistake.

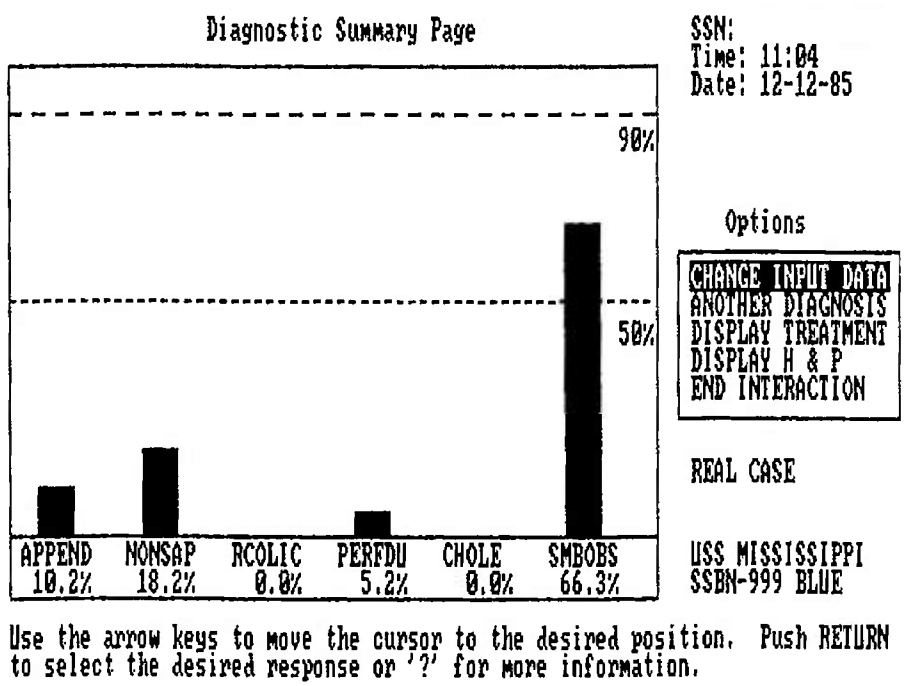


Figure 4-5 - Diagnostic Summary Page.

4.1.6 Corpsman's Diagnosis

On this display page you enter your diagnosis. You do this whenever you enter a new case or make changes to a previous case. The computer will compare your diagnosis to its diagnosis and tell you whether or not it agrees with you. If you and the computer are in agreement, you will proceed to the Diagnostic Summary Page. If not, the computer checks for key answers on which you and the computer disagreed and asks if you want to review or change any of your symptom entries. If you want to make changes, type "Y" (for YES) and you will be returned to the Data Entry Page menu where changes can be made to the history, physical exam, SSN, patient's age, or time of exam. If you don't want to review your entries or make any changes, then type "N" (for NO) and you will continue on to the Diagnostic Summary Page (see Figure 4-5).

4.1.7 Diagnostic Summary Page

Figure 4-5 is the main summary page. The graph on the left shows the computed probability for each diagnostic category. The tallest bar is the most likely diagnosis. The program is "most sure" of the diagnosis when the probability is greater than 90%. To help keep this in mind, a line is drawn across the graph at the 90% level. Remember that the computer considers only six diagnoses. *It is always possible that the patient has another illness.*

The date and time of the exam are in the upper right hand corner. If the case is real, the patient's SSN will also be there. The type of case - real or simulated - is shown in the lower right hand corner along with the name of the boat.

On the right side of the Diagnostic Summary Page, five options are available. These are:

4.1.7.1 Change Input Data

This reviews or changes any symptom entries relating to the present case. You can make changes to the history, physical exam, or SSN/Age/Time portions of the present case.

4.1.7.2 Another Diagnosis

This enters another case, either real or simulated. Your case will be stored and the responses cleared for a new patient. You will then be returned to the Main Option Page (see Figure 4-2), where you can access any one of seven options available on that page.

4.1.7.3 Display Treatment

This accesses the treatment protocols which exist for each diagnostic category. Each treatment protocol contains a discussion of the disease, a differential diagnosis,

actual treatment guidelines, the probable outcome with treatment, and possible complications and their management. The treatment protocols are printed in Appendix A.

4.1.7.4 Display H & P

This lists the history and physical exam symptoms for this case. History symptoms are given on one page (see Figure 4-6) and physical exam findings on another. If a printer is connected to the computer, a hard copy of the symptom entries can be obtained (while they are displayed on the computer screen) by pressing the SHIFT key and the PRTSC key at the same time. After the listing of symptoms is completed, you are returned to the Diagnostic Summary Page.

```
History Summary (Real case)          SSN:                    11:04  12-12-85
-------------------------------------------------------------------------------

AGE 30-39                            PREV. ABD. SURGERY
PAIN ONSET CENTRAL                   NO PREVIOUS ILLNESS
PAIN NOW CENTRAL                     NOT TAKING MEDS
PAIN INTERMITTENT
PAIN IS SEVERE
NOTHING AGGRAVATES
PROGRESS - WORSE
DURATION 12-24 H
LYING STILL RELIEVES
NAUSEA PRESENT
VOMITING PRESENT
CONSTIPATION PRESENT
APPETITE DECREASED
NO JAUNDICE
URINATION - FREQUENT
PREVIOUS INDIGESTION
NO PREV. SIM. PAIN

-------------------------------------------------------------------------------

     Enter (P)revious, (N)ext, or (?) for help.
```

Figure 4-6 - An Example of History Symptoms Listing.

4.1.7.5 End Interaction

This exits the program and ends your interaction with the computer. You may now run other programs.

4.2 Overview of the Training Module

The training program contains fifty patient narratives. There are twenty-five "easy" narratives and twenty-five "hard" narratives. The difficulty scale is based on the ease of interpreting the narrative, not the actual diagnosis. Based on the narrative, you complete the paper and pencil form of the abdominal pain data sheet, enter the symptom findings into the computer and obtain a computer diagnosis. The program scores your accuracy in abstracting data from the patient narrative. No permanent record is kept of your performance in the training program.

4.2.1 Easy Case Narrative

You may choose from 25 easy case narratives. The cases do not change, so case 1 will always have the same narrative from session to session. This allows you to return to a specific case narrative at a later time. The narratives are presented in a straightforward manner. After selecting the number of the desired case, you will be shown a page of the history and another page of the physical findings. You may toggle back and forth from one to another. You should fill out the data sheet while viewing the history and physical, or you may elect to print the display pages using the PRTSC key.

4.2.2 Harder Case Narrative

There are 25 hard case narratives, also constant from session to session, whose presentation of the history and physical findings are more vague than are the easy case narratives.

4.2.3 Enter Data

After filling out the data sheet, select this response to enter the data. From here you will be taken to the Data Entry Option Page where you will enter the data as though you with a real case. After you have entered all of the information on the case, and selected your diagnosis, the Training Diagnostic Summary Page will be displayed. This page is different from the Diagnostic Summary Page only in that a score will be printed in the upper right quadrant of the screen. The score is computed from the number of responses you missed in filling out the data sheet. If you are using the training program as a part of your at-sea medical training, you may want to get a copy of the summary screen with your score to put in your at-sea training file.

4.2.4 Exit Training Program

This response exits the training module and return you to the Main Option Page.

4.3 Overview of the SF-600 Generation Module

The SF-600 generation module allows you to print out the medical record entry on the patient whom you entered as a real patient into the program. The output of the program is in the form of a SOAP note except that the letters "S", "O", "A", and "P" are not used. The entry will have the date and time of the evaluation taken from the date entered into the computer when the case was stored, and the name and hull number of the boat will be printed on the first line of the entry.

4.3.1 Selection of Real Case

Only cases that have been saved as real cases can be used in the SF-600 Generation Module. A list of the real cases will be displayed by SSN, date, and time of the exam. Use the arrow keys to move the cursor to the desired case and press ENTER to select it.

4.3.2 Output

There are four things you can do with the medical record entry. You can display it for review; you can send it to a file where you may modify it with a word processing program; you may just store it, or finally you may send it directly to a printer. If you are sending the output to a printer, the computer assumes that the printer is using the actual SF-600 form; so before printing, it will ask if the printing is to begin on the front or back of the SF-600. If you print on the actual SF-600 forms, you should always start at the top of the front or back of the page. Otherwise the computer cannot determine how many lines to print on a particular side of the form.

Single-spacing is used if the output is sent to the screen or to a file on the disk. If the output is sent to the printer, double-spacing is used.

4.3.3 Modifying VS/Lab values

Since the vital signs and WBC count are entered into the program as ranges, you are given the option to enter the actual value of the results. If you desire to have the range printed, just press ENTER by the appropriate item. If you do not desire to have an item listed, enter "X" after the item. For example, if you did not perform a WBC count, then enter "X" by the item WBC and it will not be printed on the SF-600.

4.3.4 Additional Information Necessary for Selected Items

You may type in your comments on certain positive responses in the history or physical examination sections. This allows a more complete description of other aggravating factors, other relieving factors, previous abdominal surgery, previous illness, current medication, surgical scars, abdominal masses, and rectal masses. If you performed a rectal examination, you will be asked if you did a stool guaic and if

it was heme positive. As above, you may delete an item, enter comments, or let the programmed output stand.

4.3.5 Additional Information for History or Physical Exam

Since the diagnostic module considers just the 37 questions, you may type in additional information to both the history and physical examination. This will be added to the respective sections of the medical record entry.

4.3.6 Final Diagnosis

You will be asked if you agree with the computed diagnosis. If you disagree, enter your diagnosis, and it will be used as the final diagnosis for the medical record entry. Otherwise, the computed diagnosis is used.

4.3.7 Treatment Plans

You have two choices for entering the plan for the patient. You can enter it line by line as you entered the additional history and physical information, or you can use a plan that you wrote using a word processor and stored on the disk. To write your own plans for use with this module, you will need a word processing program. If you are not familiar with one, get someone who has one to write the plan files for you. A sample plan, called VIRALGI.PLN, is included with the program as a guide to the format needed when you design your own plans.

4.3.8 Changing the Printer Format

You may find that the medical record entry does not print correctly on your printer. If so, you will probably need to modify the file SETUP.DAT where some of the printer parameters are kept. This file is an ASCII file so you should be able to modify it with any word processor or a text editor such as the one included with MS-DOS. A sample SETUP.DAT file is :

```
0
0
0
0
44
56
66
```

The first line (0) is the setting of the left margin of the front page of the SF-600. The second line (0) is the left margin of the back of the SF-600. The third (0) line is the number of lines in the top margin of the front page. The fourth line (0)

is the top margin of the back page. The fifth line (44) is the bottom line of the first page. The sixth line (56) is the bottom line of the back page. The last line (66) contains the number of characters in a line across the page.

You may need to experiment to find which settings work best for your printer. Be sure to check the revision number of the SF-600 forms. Several different revisions exist, and the size of the forms may vary. A photocopied SF-600 may not work with the same printer settings as the "real" SF-600. If you can, obtain several packets of the SF-600 forms with the same revision number and use them for printing the SF-600. Rev (5-84) appears to work well.

5. USING THE ABDOMINAL PAIN DIAGNOSTIC PROGRAM (Tutorial)

5.1 Running a Real Case

In this section. we will "walk through" entering a real case into the computer. It is assumed that you have read the overview above. If not, do so now.

First you start the program. Either place the disk into the computer's floppy drive or go to the appropriate subdirectory on the hard drive as mentioned in the section on Starting the Program (2.5). Enter "START" to begin the program. If you have never used the program before, you should be asked several questions about your boat and your name. Your responses are necessary to print the SF-600. If you have used the program before, you will skip the customization page and will proceed to the Title Page, where your boat name should be displayed. If it is incorrect, follow the directions in the section on the customization page (4.1.4) to change it.

Now follow the instructions shown on the screen until you reach the disclaimer page. Now press a key to continue to the Main Options Page. The menu displayed here is the root menu for the program. All the modules of the Abdominal Pain Diagnostic Program are accessed from here. In our example, we want to enter a real case, so press ENTER to select the Real Case option, since it is already marked by the cursor.

Next you will be asked to enter the patient's SSN and age. For our example, the patient's SSN is 123-45-6789 and his age is 23. After you have entered the above information, the computer will display a date and time for verification. The date and time should be the current date and time assuming they were entered correctly when the computer was first turned on. If the time of the exam is different from the current time, change it to correspond to the time of the actual examination. In our case we will assume that we have just completed the exam, so type "Y" in response to both the date question and the time question. A summary sentence will then be displayed at the bottom of the screen. Now press any key to continue.

The Date Entry Options Page is now displayed. From here you will make selections to enter the patient's history and physical exam findings. Also, you may return to the page where the patient's SSN, age, and time of exam were entered to make corrections.

First press ENTER to go to the History Pages. There are four History Pages. Each page is numbered in the top right hand corner of the display. The layout of the questions is consistent with that of the data sheet. You can use the arrow keys to move the cursor in the appropriate direction. Select RUQ pain at onset by pressing ENTER. A pair of asterisks will appear by the selection and the RUQ region of the abdomen will be painted. Press ENTER again. The asterisks disappear, and the abdomen is cleared. Press TAB to move the cursor to the first response of each question on the page. Try it now. Now type the "N" key to take you to page 2. Type the "P" key. You should now be back on page one. Use the "N" and "P" key to move from page to page quickly. Type "?" to see the definition of the question above the cursor.

Now that you have used the keys, answer every question on the history pages. You can make up answers for this example. When you have answered the questions on page four, type "N" to go to the Data Entry Options Page.

On the Data Entry Options Page, press the down arrow once to move the cursor to the selection GO TO PHYSICAL EXAM PAGES and press ENTER.

You are now on page one of the five Physical Examination Pages. Using the same keys as before, answer all of the questions on each of the five pages and return to the Data Entry Options Page.

Now that all questions have been answered, the computer can make it's diagnosis. Press the down arrow twice to select MAKE DIAGNOSIS and then press ENTER. The Corpsman's Diagnosis Page will then be displayed.

Before the computer will display the computed diagnosis, you must first enter your diagnosis for the patient by selecting the appropriate response from the list shown on the display screen. After you enter your diagnosis, the computer will compare it with the computed diagnosis. If the two diagnoses are the same, the program moves to the Diagnostic Summary Page. If the two diagnoses disagree, the computer will give a list of items that play an important part in differentiating between the two diagnoses. You should review the list carefully to be sure that your entries were recorded properly. Then you may return to the Data Entry section to make changes, or you may continue to the Diagnostic Summary Page.

The next section shown is the Diagnostic Summary Page. Here is a graphic representation of the probabilities for the various diseases considered by the program. Those probabilities above the 90% line are most likely. To the right of the screen is displayed the patient's SSN along with the date and the time of the examination. Also, the statement REAL CASE and the ship's name will be listed in the lower right hand corner.

Press the down arrow three times to select the item DISPLAY H & P and then press ENTER. You will be shown a summary listing of the history responses on one page and the physical examination responses on the next page. You can obtain a hardcopy of these two pages by pressing the PRTSC key. Return to the Diagnostic Summary Page by typing "N" while on the Physical Summary page.

Next, press the down arrow key twice to select the response DISPLAY TREATMENT and press ENTER. The Treatment Summary menu will be displayed. You may review the treatment for one of the diseases listed by using the arrow keys to move the cursor to the desired entry and pressing ENTER. For our example, select APPENDICITIS. The first page of the treatment summary for appendicitis will be displayed. Notice that the bottom right hand corner contains the current page number and the total number of pages in the summary. Each treatment protocol is comprised of a discussion, differential diagnosis, treatment plan with medicine dosages if applicable, probable outcome with treatment, and possible complications and their management. Type "N" to move to the next page in the section, type "P" to move to the previous page, and "X" to exit from the section back to the Treatment Summary menu. Return now to the Treatment Summary menu by typing "X". Move the cursor to the last response entitled EXIT THIS DISPLAY and press ENTER to return to the Diagnostic Summary Page.

If you desire to make changes to the history or physical, select CHANGE INPUT DATA. The case is stored on the disk and you will be returned to the Data Entry Page where you can then modify your responses. Select ANOTHER DIAGNOSIS on the Diagnostic Summary Page to store the current case on the disk, clear the responses made in the computer's memory and return to the Main Options page where you could either run the SF-600 generation program or enter data on a different patient. If you have finished with the program, select END INTERACTION to store the current case on the disk and return the computer to MS-DOS. Remove the floppy disk if you have been using one, and turn off the computer.

5.2 Running a Simulated Case

To enter a simulated case, select the SIMULATED CASE option on the Main Option Page (see Figure 4-2). This option allows you to enter your own 'made up' history and physical exam findings into the computer. Simulated cases which are entered into the computer are stored on the computer disk, but they cannot be printed out on a SF-600. Since you use this option for self-guided instruction, you should complete a data sheet with a particular disorder in mind before you use the computer.

Once the simulated case option is selected, the computer requests the patient's age, and confirmation of date and time of the exam. With a simulated case, the program does not request a social security number, but instead assigns the number 000-00-0000. Instructions for data entry and making a diagnosis are the same for simulated and real cases. Enter a simulated case as you would a real one (see section 5.1). The Diagnostic Summary Pages for simulated and real cases differ only in that the phrase SIMULATED CASE is displayed instead of REAL CASE.

In summary, the simulated case differs from the real case in that the SSN, date, and time of the exam are chosen by the computer in the simulated case, the phrase SIMULATED CASE is used instead of REAL CASE, and the simulated cases cannot be used to print the SF-600.

5.3 Using the Training Module

The training program presents twenty-five case histories with "easy" and "hard" narratives for each for a total of fifty cases. The easy narrative presents the information in a straight-forward manner. The hard narrative presents the same information in a more complex way.

To run the Training Module, select TRAINING MODULE from the Main Options menu. You will now be shown the Training Options menu. Select the easy case narrative. Enter "1" to select case number 1. You will then be shown the history narrative for case 1. After reading the narrative, fill out the abdominal pain data sheet and proceed to the physical page by typing "N". Read the physical narrative and fill out the remainder of the datasheet. Now type "N" to return to the Training Options menu and select ENTER DATA. Type "Y" to confirm that the case you are entering is case number 1. Now enter the patient's age. Notice that an SSN, date and time for the exam are automatically supplied. You will then be taken to the Data Entry Options menu for the training module. From here, enter the information from the data sheet as you would for a real or simulated case.

When you have answered all the history and physical questions, select MAKE DIAGNOSIS from the Data Entry Options menu. If your responses differ greatly from those for that training case, you will not be able to proceed to the summary page. In that instance, review the narrative and change your responses when they differ from the narrative and select MAKE DIAGNOSIS again. As with a real or a simulated case, you must enter your diagnosis before the computer will display its own. After your diagnosis is entered, the Diagnostic Summary Page is displayed. On this Diagnostic Summary Page, your score, the phrase TRAINING CASE, the case number, and a new option, SHOW MISSED ITEMS, are added to the usual summary data.

Your score is derived from the number of responses you entered correctly divided by the total number of correct responses. Your diagnosis is not considered in deriving the score. Now select SHOW MISSED ITEMS. This option allows you to view those responses you missed. Those correct responses you failed to enter are listed with the word "(omitted)" written alongside. The incorrect responses you entered are listed without the comment. After viewing the items missed, press any key to return to the Diagnostic Summary Page.

You may select END INTERACTION to exit the program entirely, or you may select ANOTHER CASE to return to the Training Options menu, where you may select Exit Training Module to return to the Main Options Page of the diagnostic program.

5.4 Retrieving Last Real or Last Simulated Case

Select this option from the main option page to retrieve the last real or last simulated case entered into the computer. While all real and simulated cases entered into the computer are stored on the disk, only the last ones are available for recall into memory.

Occasionally you will see a patient who presents with such a vague early picture that you must perform several evaluations until you are sure of your diagnosis. If you select the option LAST REAL CASE you can update the time and findings of the exam instead of re-entering all of the information each time you examine the patient.

Select LAST SIMULATED CASE to review the last simulated patient you were examining.

Note that if you do not make any changes to the recalled case and you select MAKE DIAGNOSIS, you will not be asked to enter your diagnosis. Instead, the program will proceed directly to the Diagnostic Summary Page. If you make any changes, even if you revert to the original recalled profile, you will be asked for your diagnosis, and the case will be stored.

5.5 Using the SF-600 Generation Module

This module allows you to print the medical record entry of a real case on the SF-600. To use the module, select GENERATE SF-600 from the MAIN OPTIONS PAGE. Assuming you have real cases stored, you will be shown a list of all of the real cases by SSN, date, and time. Use the arrow keys to move the cursor to the desired case and press ENTER. Then you will be asked where the output of the generation module is to go. You can have the output displayed on the screen, printed on the SF-600, or sent to a file where you could make changes to it with your word processor before printing the SF-600.

After you have made your selection, you will be shown the vital signs and lab values. Since the computer uses a range for each response for the vital signs and lab values, you will be offered a chance to change the response to a single value. If you do not know the single value, then you can press ENTER and the range will be printed on the SF-600, or you can type "X" and the item will not be mentioned on the SF-600. After answering all of the questions for the vital signs and lab, you will be asked to confirm that the responses are correct by typing "Y". Next you will be offered a chance to comment on specific items to which you responded positively. For example if the patient has had previous abdominal surgery, you will be asked to describe that surgery. Otherwise, you can enter "X" to omit any reference to the question, or just press ENTER to have the SF-600 state that the patient has a history of previous abdominal surgery. This same format is used for all of the other responses that may require comment.

If a rectal exam was performed, you will always be asked if the stool was checked for occult blood and, if so, was it positive.

After you have replied to all of the specific responses displayed, you will be asked to enter any additional information on the history and then the physical examination that you feel is important.

After completing the history and physical questions, you will be asked if you desire to change the computer's diagnosis. If you do not agree with the diagnosis,

type Y and you will be asked to enter the diagnosis as it should be printed on the SF-600. If you agree with the diagnosis, type "N".

Finally the patient plan is entered. You will be asked if you have a plan stored on the disk. If you have a plan stored as a file, then type "Y" and then enter the name of the file. You can make your own routine plans using a text editor such as EDLIN or your favorite word processor. See the file VIRALGI.PLN for an example. If you do not have a plan stored, type "N". The number 1 will appear on the screen. Now enter the plan on the computer screen as you would prepare it using a typewriter. Each item in the plan is numbered, and can be several lines in length. IF you need more than one line for the first item, press ENTER at the end of each line. However, the computer will print everything in the right place on each line of form SF-600. After you have entered all of the information for the first item, press ENTER on a line by itself. This signifies the end of the first item and now the number 2 will be displayed. Enter the information for the second item and proceed as above. When you have made all entries for the plan, press ENTER by itself while on one of the numbered lines. This informs the computer that the plan is completed.

Next the computer will send the output to the location you earlier specified. If it is sent to the screen, the computer will print the information to the screen one page at a time and you will be asked to press a key to continue to the next screen. If the output is sent to the printer, you will be asked whether you are starting the printout on the first page or the second page of the SF-600. You must start at the top of the page on either side, otherwise the computer will not know how many lines it can print on the SF-600. Also, if the medical record entry is sent to the printer, the computer will double-space the document. If the entry is sent to a file or to the screen, the computer will use single-spacing.

Acknowledgements

The original Abdominal Pain Diagnostic Program was produced by Dr. F. T. deDombal at the University of Leeds, England. Several editions of support manuals and versions of the diagnostic program were produced by J. V. Henderson, B. Ryack, G. Moeller, D. C. Arthur, R. Post, W. Schroeder, and S. F. Osborne for use on the Tektronix 4051. Without their efforts the program would not exist. The present revision has been completely rewritten for use with an MS-DOS microcomputer, but the definitions are unchanged and the treatment protocols were modified only by the addition of several newer drug regimens.

The authors would like to express their deepest appreciation for the advice and criticism of Dr. George Moeller, Dr. Bernard Ryack, Mr. Ernest Noddin, Dr. Kendall Bryant, HMC(SS) Dan Johansen, and HMC(SS) Dale Hamilton. In addition, Ms Ellen Perkins and Mr. Harry Fiske provided superb technical support.

APPENDIX A
TREATMENT PROTOCOLS

Acute Appendicitis - (APPEND)

DISCUSSION

Acute appendicitis will be the second most common diagnosis of acute abdominal pain (behind NONSAP), occurring with an incidence of 11-12/1000 in most age groups. Periumbilical pain is typically the first symptom, accompanied almost invariably by anorexia. The pain is frequently diffuse and not well localized initially, gradually shifting to the right lower quadrant and becoming constant and discrete as the inflamed appendix begins to irritate the right lower quadrant peritoneum. Nausea, vomiting or diarrhea are variable. Temperature, pulse and respiratory rate are only slightly elevated unless perforation occurs.

A history of right lower quadrant pain and a finding of right lower quadrant tenderness and rebound are the most important indicators in acute appendicitis. Since the appendix may lie dorsally, the rectal examination is also extremely important. The white blood cell count is usually elevated above 10,000 with a preponderance of neutrophils. The urinalysis will also usually reveal an increase in WBC's. All other lab tests are relatively valueless in making the diagnosis of acute appendicitis.

DIFFERENTIAL DIAGNOSIS

Other illnesses that produce symptoms mimicking acute appendicitis and which should be considered are:

a. mesenteric adenitis
b. Meckel's diverticulitis
c. diverticulitis
d. regional enteritis
e. inguinal hernia
f. ureteral calculus - see RCOLIC
g. perforated ulcer - see PERFDU
h. acute cholecystitis - see CHOLE

a.) Symptoms of mesenteric adenitis can be indistinguishable from those of acute appendicitis but the pain may not be as well localized and the white blood cell count may contain an increased number of lymphocytes. The treatment remains the same as for appendicitis.

b.) Symptoms of Meckel's diverticulitis will also closely mimic those of acute appendicitis if the diverticulum is in its usual position in the right lower quadrant. The treatment remains the same as for appendicitis.

c.) Diverticulitis confined to the cecum can be indistinguishable from appendicitis. More often, intermittent symptoms of the more common diverticular disease of the left colon will precede the acute episode. The pre-existence of diverticular disease does not preclude development of acute appendicitis concomitantly. The treatment remains the same as for appendicitis.

d.) Acute attacks of regional enteritis are usually preceded by bouts of crampy abdominal pain and diarrhea. An attack of regional enteritis involving the terminal ileum can be indistinguishable from acute appendicitis. Again, the pre-existence of regional enteritis does not preclude development of acute appendicitis concomitantly. Treatment remains the same as for appendicitis.

e.) An inguinal hernia can be easily distinguished by its sharp, localized pain which radiates into the testicle and by a palpable lump in the inguinal canal, accentuated by valsalva. Treatment is symptomatic pending surgical consultation ashore.

TREATMENT

The aims of conservative treatment of acute appendicitis are to control the bacterial invasion of the inflamed appendix and to prevent the spread of infection. This is accomplished by combining vigorous antibiotic therapy with 'intestinal rest'. Fortunately, the pathology of acute appendicitis progresses slowly enough that body defenses have a chance to mobilize. The primary defense consists of omental migration toward the inflamed appendix in an attempt to surround and confine the infective process.

The treatment regimen should consist of the following:

a. antibiotics
b. intravenous fluid and electrolyte replacement (2 liters Ringer's Lactate and 1 liter D5W q daily)
c. intestinal rest
d. abdominal ice packs - optional.

a.) Maintenance of bactericidal blood levels of antibiotics effective against intestinal flora is imperative. Coverage should ideally include the gram negative organisms, the enterococci (Streptococcus fecaelis), and the anaerobes. Cephapirin and gentamycin cover these organisms and are recommended as per LANTFLT letter of 7 Oct 85.

If cephapirin is not available, a less desired alternative is included in which ampicillin and gentamycin cover the gram negative organisms and the enterococci while clindamycin covers anaerobes.

Initial dosages are as follows:

CEPHAPIRIN-GENTAMYCIN REGIMEN:

CEPHAPIRIN - 1 gr q 6h IV. (dilute 1 gr in 10 cc sterile water and given slowly over 3-5 minutes, or given with the IV injection. It is also compatible with LR and D5W.)
GENTAMYCIN - 1.5 mg/kg q8h IV or IM. (For IV, dilute with 50-200 ml of IV solution and infuse over 1/2 to 2 hours.)

AMPICILLIN-GENTAMYCIN-CLINDAMYCIN REGIMEN:

AMPICILLIN - 500mg q6h IV. (Dilute and infuse as per package insert.)
GENTAMYCIN - 1.5 mg/kg q8h IV or IM. (Dil as before.)
CLINDAMYCIN - 300mg q6h IV. (Dilute in 50 ml of IV solution and infuse over at least 10 minutes.)

If only penicillin and gentamycin are available, the following regimen may be used, although it will be even less effective than the above regimens.

PENICILLIN-GENTAMYCIN REGIMEN:

PENICILLIN - 6-10 million units per day (depending on patient weight) by IV. (Dilute and infuse as per package insert.)
GENTAMYCIN - 1.5 mg/kg q8h IV. (Dil. per GENT above)

b.) Intravenous fluids are utilized to maintain daily fluid and electrolyte requirements. D5NS or D5RL should be infused at a base rate of 125-150 ml/hour. Additional fluid replacement should be calculated to compensate for the extra fluid losses from temperature elevation, diaphoresis, emesis, diarrhea, and nasogastric suctioning according to the individual requirements. Fluid and electrolyte replacement must keep pace with losses to prevent dehydration and electrolyte imbalance. Monitoring of the hematocrit is a good indicator of the adequacy of hydration.

c.) Intestinal rest is accomplished simply by placement of a nasogastric tube and by keeping the patient NPO. Mild intermittent suction (1-3 psi) is most effective and must be coupled with diligent maintenance of patency with PRN irrigation with small amounts of saline.

d.) Abdominal ice packs applied to the right lower quadrant may decrease both intraluminal pressure and motility locally as well as offering some psychological benefit to the patient. If used as an adjunct to the above treatment regimen, it

should be continued only if subjective relief is obtained. An adverse effect is to possibly reduce the rate of diffusion of antibiotics to the area.

NOTE: Pain medications are relatively contraindicated since they will mask the patient's sensorium and obscure subjective evaluation thereby masking possible deterioration in the patient's condition. The patient should be kept at bed rest in a slightly elevated (semi-Fowler's) position to prevent subdiaphragmatic involvement in the event of free perforation.

USUAL COURSE WITH TREATMENT

Response to the therapeutic regimen will be slow initially. The patient's discomfort will resolve over the first 48 hours, his temperature and pulse will remain elevated for 48-72 hrs, and the leukocytosis will progress well beyond 72 hours as the inflammatory response peaks and begins to resolve. By 96 hours the patient's symptoms should have abated and he should be ambulatory, tolerating a light (liquid) diet when peristalsis resumes. When a diet is tolerated, PO antibiotics can replace the IV's and intravenous fluids can be discontinued. Antibiotics must be continued for at least 10 days, however.

COMPLICATIONS AND THEIR MANAGEMENT

Diffuse peritonitis and/or abscess formation are the complications of concern. It must be stressed, however, that appearance of complications in those patients treated with the above regimen is extremely unusual. Perforation may occur yet is not usually catastrophic since the body's defenses wall off the inflamed appendix, thereby sequestering the infective process.

Diffuse peritonitis resulting from uncontained perforation will present as a rapid deterioration of all signs and symptoms as indicated by:

i. progressive tachycardia, fever and tachypnea,
ii. diffusely distended, tender, silent, rigid abdomen despite nasogastric suction,
iii. general deterioration of the status of hydration and electrolyte balance despite vigorous fluid replacement.

These signs can develop with frightening rapidity during any stage of management of an acute appendicitis and are indications for IMMEDIATE MEDEVAC and more vigorous fluid and antibiotic therapy while observing for indications of shock. The dose of penicillin should be increased to 30 million units/day or the ampicillin increased to 150 mg/kg/day.

Development of a right lower quadrant mass may indicate the formation of an abscess around the inflamed appendix. Omentum or adjacent viscera walling off a severely inflamed appendix with or without perforation is a more common explanation for the mass than development of an abscess. The former will resolve with conservative therapy. If the right lower quadrant mass is accompanied by continued fever or other signs which resolve more slowly than anticipated, an abscess

may be forming. The conservative regimen should be continued, however, watching for signs which might indicate free perforation as above. Abscess formation is not a critical event and can be managed surgically after return from patrol if it persists.

AS A FINAL NOTE - it is imperative that the patient be carefully managed and monitored. Once an intraperitoneal infection has begun, the risk of metastatic infections (which present with intermittent spiking fevers) is great. Surgical management remains the mainstay of therapy for appendicitis and the patient should be MEDEVACED whenever tactically possible.

Non-Specific Abdominal Pain - (NONSAP)

GENERAL COMMENTS

The category of NONSAP is reserved for causes of abdominal pain which are vague and general and which are amenable to symptomatic treatment. This category is not meant to cover all maladies not included in the remainder of the program, but rather, is meant to include those illnesses which are non-surgical, not life-threatening, and, therefore, are not reasons for evacuation. The spectrum of diseases which can cause non-specific abdominal pain is broad and will require individualized treatment. The corpsman should treat these non-specific cases symptomatically.

The program for NONSAP also contains some indicants for aid in the diagnosis of dyspepsia/peptic ulcer disease. The treatment regimen for this disorder is included here for those cases which the corpsman feels fit the diagnostic criteria.

Dyspepsia / Peptic Ulcer Disease

DISCUSSION

Ulcer disease will affect 1 person in 10 during his life-time. Emotional and stress factors are the most common predisposers to dyspepsia and development of ulcers. There is a reported correlation with a family history and the type O blood group. Diet plays no role in the development of ulcers and is significant only because food tends to ameliorate the symptoms of ulcer disease.

Ulcer disease tends to be chronic with exacerbations and remissions. Symptoms will last for periods varying from days to months and will disappear and recur without any identifiable cause. Most cases resolve without complication.

The patient will present complaining of a steady, gnawing, burning ache centered in the epigastrium and spreading slightly to either side, usually more to the right. The pain characteristically occurs 1 1/2 to 2 1/2 hours after meals and is rapidly relieved by ingestion of food or antacids. This is the most important aspect of the diagnosis: the pain-food-relief sequence. Also characteristic is the history of pain in the middle of the night and the absence of pain upon awakening in the morning.

The physical examination will be non-revealing except for confirmation of tenderness centered in the epigastrium. Occult blood may be revealed by rectal examination.

DIFFERENTIAL DIAGNOSIS

The symptom complex presented above is difficult to confuse with other illness, yet the sometimes vague initial symptoms of a new ulcer can produce confusion with one of the following illnesses:

a. gastritis/gastroenteritis
b. cholecystitis - see CHOLE
c. pancreatitis
d. hepatitis

a.) Gastroenteritis may initially present as a crampy pain in the epigastrium but will quickly involve symptoms of nausea, vomiting and diarrhea, thereby differentiating it from ulcer disease. Ulcer disease generally has a more protracted and gradual course. Gastroenteritis is also accompanied by systemic symptoms of viral (the usual pathogen) illness (myalgia, fever, malaise).

c.) Pancreatitis is often associated with duodenal ulcer disease, cholecystitis, trauma, and alcoholism and will present as a boring epigastric pain which usually penetrates to the back. Signs and symptoms of peritoneal irritation are sometimes present with pancreatitis, yet not with peptic ulcer disease unless complications intervene. Antacids will not relieve the pain of pancreatitis, and food is not associated with the pain. Treatment is the same as for perforated duodenum except massive doses of antibiotics are not necessary.

d.) Hepatitis may initially present with a dull epigastric pain, but usually the pain will be more to the right side and be accompanied by signs of jaundice, dark urine and a palpable liver.

TREATMENT

The mainstay of ulcer therapy is the neutralization of gastric acidity. This is accomplished with a regimen of antacids. Although reducing stomach acidity, there is little evidence that antacid therapy promotes ulcer healing. Food adequately buffers stomach acidity for approximately 90 minutes, afterwhich the stomach is empty and secreting unneutralized acid. Antacids taken 1 hour after meals will effectively buffer acid for an additional 2 hours. In contrast, antacids taken on an empty stomach will transit the stomach within 30 minutes.

A balanced antacid (one with both a constipating ingredient such as aluminum hydroxide and an ingredient which promotes osmotic diarrhea such as magnesium hydroxide) is the most advantageous for continued therapy. Maalox and Mylanta are balanced agents, whereas Amphogel contains only aluminum hydroxide. The recommended dosage schedule is as follows:

ACUTE STAGE: 30 ml of liquid antacid hourly while awake and an additional 30 ml if awakened from sleep. Side effects can be minimized if the magnesium-aluminum antacid is alternated with a pure aluminum antacid. Continue for 2 weeks.

HEALING STAGE: 30 ml of liquid antacid at 1 and 3 hours after meals and once before bedtime. This regimen should be continued for 2 months.

OCCASIONAL PAIN: 15-30 ml of liquid antacid PRN.

RECURRENCE: Treatment should be reinstituted as for the Acute Stage.

Anticholinergics can diminish gastric acid secretion but must be given in sufficient doses such that the effects of dry mouth and blurred vision are evident. Anticholinergics are, therefore, not recommended as adjunctive therapy. Cimetidine, however, will block gastric acid secretion without side effects and, although not on the AMAL, can be used at sea.

Altering of one's diet has not been shown to have any effect on either the development or the healing of ulcers. Gastric irritants such as aspirin and alcohol should be avoided. Caffeine has been shown to increase acid secretion and nicotine will delay healing. They should also be avoided.

USUAL COURSE WITH TREATMENT

Most patients treated with the above regimen will comment on the immediate symptomatic relief offered by the antacids and will experience a gradual diminution of all other symptoms within 2 to 4 weeks. Recurrences are common and should be treated as acute cases.

COMPLICATIONS AND THEIR MANAGEMENT

The most common complications of peptic ulcer disease are hemorrhage and perforation. These complications develop in 10-20% of symptomatic cases. Interestingly, 20-30% of all hemorrhage and perforation cases occur with no antecedent history of ulcer symptoms. Less often, the complications of obstruction and intractable pain will arise, requiring definitive (surgical) treatment.

Hemorrhage will be evident as either vomitus which is colored bright red (hematemesis) if the bleeding is profuse or as dark colored stool (melena) if the bleeding is slow and subclinical. Although melena is a cause for concern and investigation at the earliest convenience, it is not life-threatening and can be treated with the Acute Stage protocol, above. (Keep in mind that there are many causes for melena and one should not assume the diagnosis of peptic ulcer disease unless the symptom complex described above accompanies the melena - even then, there may be more than one source of occult blood.)

Hematemesis is, however, a medical emergency and should be treated with the aim of maintaining the patient's fluid and electrolyte balance to prevent shock while preparing him for evacuation. Intravenous fluids are utilized to maintain fluid and electrolyte balance in an attempt to counteract the potentially massive blood loss from an ulcer which has eroded an artery within the duodenal wall. NS or RL should be infused at a base rate of 125-150ml/hour. Additional fluid replacement should be calculated to compensate for the extra fluid losses from temperature elevation, diaphoresis, emesis, diarrhea, and nasogastric suctioning as well as estimated blood loss. Fluid and electrolyte replacement must keep pace with losses to prevent dehydration and electrolyte imbalance. Monitoring of the hematocrit is a good indicator of the adequacy of hydration. If the bleeding is profuse, an attempt should be made to stop the hemorrhage using iced saline lavage. The patient should be kept NPO and a nasogastric tube placed. Iced saline lavage should be administered via the nasogastric tube until the lavage is clear.

Perforation and obstruction should be managed by the protocols for PERFDU and SMBOBS, respectively.

Cholecystitis - (CHOLE)

DISCUSSION

An attack of acute cholecystitis is usually precipitated by a gall stone impacted in the cystic duct and is accompanied by a history of similar attacks with intolerance to fatty or greasy foods. The diagnosis is suggested by the presence of severe right upper quadrant pain, nausea, vomiting, fever, and minimal jaundice. Subscapular or right shoulder referred pain further strengthens the diagnosis.

The physical examination will reveal a fever in two-thirds of the cases with guarding and tenderness in the right upper quadrant. A tender mass representing the swollen gall bladder and adherent omentum is palpable in about half the cases. The white blood cell count will be variably elevated.

DIFFERENTIAL DIAGNOSIS

Other illnesses that produce symptoms mimicking cholecystitis and should be considered are (in order of decreasing frequency) :

a. myocardial infarction
b. perforated duodenum - see PERFDU
c. peptic ulcer disease - see NONSAP
d. pancreatitis
e. right lower lobe pneumonia
f. small bowel obstruction - see SMBOBS

a.) A myocardial infarction can present as pain in the upper abdomen with radiation to the back and shoulder especially if the diaphragmatic surface of the heart is involved. Infarction will usually be associated with other signs and symptoms referable to the cardiovascular system.

d.) Pancreatitis is often preceded by a history of gall bladder disease and presents as a sudden onset of severe boring epigastric pain which penetrates to the back. The pain is not as well localized as with cholecystitis and jaundice is usually not evident. Treatment is the same as for perforated duodenum except massive doses of antibiotics are not necessary.

e.) Right lower lobe pneumonia often presents as right upper quadrant pain with shoulder radiation if the diaphragmatic surface of the pleura is involved. Differentiation is made by a careful examination of the chest.

TREATMENT

Treatment of uncomplicated cholecystitis consists of analgesics for relief of pain and either clear liquids or an NPO regimen depending on the severity of the patient's symptoms and his tolerance of PO nourishment. If nausea and vomiting are problematic, the NPO regimen should be augmented with placement of a nasogastric tube maintained with mild (1-3 psi) suction and ensuring patency by irrigating with small amounts of normal saline occasionally.

USUAL COURSE WITH TREATMENT

Patients treated as above will usually have complete remission of symptoms within 1 to 4 days. The patient should have a radiographic study of the gall bladder performed ashore whenever convenient.

COMPLICATIONS AND THEIR MANAGEMENT

Occasionally, the complications of perforation, development of a gangrenous gall bladder, pancreatitis, or inflammation of other surrounding structures will result in deterioration of the patient's condition. These will be evident as:

i. progressive tachycardia, fever and tachypnea,
ii. diffusely distended, tender, silent, rigid abdomen despite NG suction,
iii. general deterioration of the status of hydration and electrolyte balance despite vigorous fluid replacement.

Development of any of these complications and inherent peritonitis is a life-threatening event requiring stabilization of the fluid and electrolyte balances, institution of vigorous antibiotic therapy, and preparation for IMMEDIATE MEDEVAC. These patients should be treated with the same treatment protocol as perforated duodenum - see PERFDU.

Perforated Duodenal Ulcer - (PERFDU)

DISCUSSION

Acute perforation of any abdominal viscus, in this case the duodenum, is a catastrophic event requiring immediate stabilization in preparation for medevac while instituting a regimen of broad- spectrum antibiotic coverage and fluid replacement. Duodenal perforation usually occurs as a sudden steady and severe pain in the right upper quadrant or epigastrium. The patient will lie still in bed with his legs flexed since the pain is aggravated by movement or coughing. He may vomit initially although sustained vomiting is not characteristic. The patient will usually relate a history of ulcer disease or ulcer symptoms.

Examination of the abdomen reveals a rigid, quiet abdomen with marked direct and rebound tenderness. The pain may migrate depending on the location of the gastric contents which have been allowed to spill into the peritoneum. Peritonitis in the right lower quadrant by this mechanism may suggest the diagnosis of appendicitis. Normal liver dullness may be lost due to free air overlying the liver in the supine position.

Perforation may occur adjacent to the pancreas or gall bladder, allowing gastric contents to irritate these organs and possibly cause pancreatitis or cholecystitis and their inherent signs and symptoms.

DIFFERENTIAL DIAGNOSIS

Other illnesses that produce symptoms mimicking duodenal perforation and which should be considered are:

a. acute pancreatitis
b. acute cholecystitis - see CHOLE
c. appendicitis - see APPEND
d. diverticulitis.

a.) Acute pancreatitis is often associated with duodenal ulcer disease, cholecystitis, trauma, and alcoholism and will present as a boring epigastric pain which penetrates to the back. Signs and symptoms of peritoneal irritation are less pronounced than with duodenal perforation. Treatment remains the same as for duodenal perforation, except massive doses of antibiotics are not necessary.

d.) Diverticulitis will present as a more mild illness which is acutely exacerbated if free perforation of a diverticulum occurs. Perforation of a diverticulum on the transverse colon may closely mimic duodenal perforation but is more readily contained by adherent omentum. Treatment remains the same as for duodenal perforation.

TREATMENT

The aims of treatment of duodenal perforation are to prevent shock and to limit bacterial seeding of the peritoneum which may result in abscess formation. Spread

of gastric contents into the peritoneum after perforation occurs rapidly. Body defenses cannot be mobilized fast enough to be of immediate benefit and, consequently, treatment must be swift and sufficient to combat shock.

The treatment regimen should consist of the following:

a. antibiotics
b. intravenous fluid and electrolyte replacement
c. intestinal rest.

a.) Maintenance of bactericidal blood levels of antibiotics effective against intestinal flora is imperative. Coverage should ideally include the gram negative organisms, the enterococci (Streptococcus fecaelis), and the anaerobes. Coverage should ideally include the gram negative organisms, the enterococci (Streptococcus fecaelis), and the anaerobes. Cephapirin and gentamycin cover these organisms and are recommended as per LANTFLT letter of 7 Oct 85.

If cephapirin is not available, a less desired alternative is included in which ampicillin and gentamycin cover the gram negative organisms and the enterococci while clindamycin covers anaerobes.

In view of its seriousness, acute abdominal perforation should be treated with massive doses of antibiotics as follows:

CEPHAPIRIN-GENTAMYCIN REGIMEN:

CEPHAPIRIN - 2 gr q6h IV. (dilute 1 gr in 10 cc sterile water and given slowly over 3-5 minutes, or given with the IV injection. It is also compatible with LR and D5W.)
GENTAMYCIN - 1.5 mg/kg q8h IV or IM. (For IV, dilute with 50-200 ml of IV solution and infuse over 1/2 to 2 hours.)

AMPICILLIN-GENTAMYCIN-CLINDAMYCIN REGIMEN:

AMPICILLIN - 150 mg/kg/day in equally divided doses q6h IV. (Dilute and infuse as per package insert.)
GENTAMYCIN - 1.5 mg/kg q8h IV or IM. (Dil as before.)
CLINDAMYCIN - 300mg q6h IV. (Dilute in 50 ml of IV solution and infuse over at least 10 minutes.)

If only penicillin and gentamycin are available, the following regimen may be used, although it will be even less effective than the above regimens.

PENICILLIN-GENTAMYCIN REGIMEN:

PENICILLIN - 30 million units per day by IV. (Dilute and infuse as per package insert.)
GENTAMYCIN - 1.5 mg/kg q8h IV. (Dil. per GENT above)

b.) Intravenous fluids are utilized to maintain daily fluid and electrolyte requirements. D5NS or D5RL should be infused at a base rate of 200-250 ml/hour. Additional fluid replacement should be calculated to compensate for the extra fluid losses from temperature elevation, diaphoresis, emesis, diarrhea, and nasogastric suctioning according to the individual's requirements. Fluid and electrolyte replacement must keep pace with losses to prevent dehydration and electrolyte imbalance. Monitoring of the hematocrit is a good indicator of the adequacy of hydration.

c.) Intestinal rest and maintenance of an empty stomach (thereby lessening the amount of gastric contents introduced to the site of perforation) is accomplished simply by placement of a nasogastric tube and by keeping the patient NPO. Mild intermittent suction (1-3 psi) is most effective and must be coupled with diligent maintenance of patency with PRN irrigation with small amounts of normal saline.

NOTE: PAIN MEDICATIONS ARE CONTRAINDICATED since they will mask the patient's sensorium and obscure subjective evaluation, thereby masking possible deterioration in the patient's condition. The patient should be kept in bed in a slightly elevated (semi-Fowler's) position to prevent subdiaphragmatic involvement by keeping gastric contents away from this area.

USUAL COURSE WITH TREATMENT

Improvement of the patient's signs and symptoms indicates sealing of the perforation which would allow resolution of the chemical peritonitis caused by the gastric contents. Control of shock and prevention of abscess formation would be a matter of continuing the treatment protocol.

Shock associated with intestinal perforation is, however, usually not well controlled and cases of perforation should be evacuated as soon as practical for definitive (SURGICAL) treatment.

COMPLICATIONS AND THEIR MANAGEMENT

The greatest dangers of duodenal perforation are shock and abscess formation. Shock from spillage of gastric contents (peptic juices, bile, pancreatic juices) into the peritoneal cavity is the result of the chemical 'burn' caused by these acids and digestive enzymes leading to extravasation of large amounts of fluids into the peritoneal space. This may be followed by hemorrhagic shock. Abscesses can form in any area of the peritoneal space. Dramatic symptomatic relief is often seen 6-10 hours after perforation as adhesions formed with the liver, mesentery or other abdominal structures halt the flow of gastric contents into the peritoneum. This event will reduce the possibility of shock, but will not affect abscess formation since bacterial seeding occurs early.

Worsening of the hypovolemic shock is a grave sign and requires all efforts at fluid and electrolyte replacement and maintenance of blood pressure. Initial resolution followed by development of fever, tachycardia, and a general deterioration in the status of hydration and electrolyte balance despite vigorous fluid replacement indicates abscess formation and sepsis.

Medevac can be temporarily delayed in those patients who symptomatically improve but should proceed as soon as practical. Immediate medevac is essential for those patients who do not experience symptomatic relief. The shock produced by the peritoneal irritation can be profound and occur with great rapidity.

Renal Colic - (RCOLIC)

DISCUSSION

Renal colic presents as the sudden onset of severe, sharp, intermittent pain in the flank area (back and side) which usually radiates to the lower abdomen, genitals or thigh area. Attacks last for variable lengths of time and are characteristically described as the worst pain the patient has ever experienced. (Despite the term 'renal colic', the pain is intermittent rather than colicky.) Hematuria and dysuria almost always accompany renal colic. A history of similar episodes is often elicited.

The physical examination reveals costophrenic angle and flank tenderness without rebound. Hematuria is usually evident microscopically.

DIFFERENTIAL DIAGNOSIS

When the pain of renal colic is not referred in the usual manner, confusion may exist with other illnesses which can present similarly:

a. acute appendicitis - see APPEND
b. acute cholecystitis - see CHOLE
c. small bowel obstruction - see SMBOBS

TREATMENT

Treatment of uncomplicated renal colic consists of analgesics for pain and augmentation of fluid intake to increase urinary volume. Large doses of narcotic analgesics may be necessary to significantly diminish the severe pain of renal colic. Fluid management should consist of IV D5NS administered at the rate of 150-200 ml/hour. If nausea and vomiting are problematic, the patient should be kept NPO and, if severe enough, may require placement of a nasogastric tube.

Every effort should be made to recover the stone when it's passed. This can be accomplished by having the patient urinate through gauze sponges. The stone should be saved for analysis in conjunction with an intravenous pyelogram (IVP) performed ashore whenever convenient.

USUAL COURSE WITH TREATMENT

The stone will usually pass within minutes or hours and will be marked by the sudden disappearance of the pain. Hematuria, dysuria and a dull ache in the flank will persist and resolve over the next 24 hours.

Encouraging the patient to drink a sufficient quantity of liquids to keep his daily urine volume over 2500 ml has been thought to decrease the incidence of stone recurrence. The patient should receive a renal consult upon return from patrol to attempt to determine factors which might predispose him to form another stone.

COMPLICATIONS AND THEIR MANAGEMENT

Renal stones which do not pass spontaneously must be removed by special urologic procedures in a hospital setting. Renal colic lasting over 24 hours will be extremely unusual and probably require evacuation. Pain lasting this long will be very exhausting for the patient.

Patients whose dull residual flank pain, dysuria and hematuria persist and who develop urinary frequency, fever and other signs of infection should be treated for a urinary tract infection which occasionally develops after stone passage. The regimen should consist of Ampicillin 500 mg q6h PO and adequate fluid intake.

Small Bowel Obstruction - (SMBOBS)

DISCUSSION

Intestinal obstruction represents the prevention of passage of intestinal contents along the course of the intestinal lumen. The causes include adhesions from previous surgery or peritonitis, entrapment of a section of bowel in a hernia, fecal impaction, carcinoma, twisting or kinking of the bowel, and paralytic ileus.

Patients with intestinal obstruction will typically present with abdominal pain, vomiting, intractable constipation, abdominal distension, and failure to pass feces or flatus. The abdominal pain is described as crampy and intermittent, occurring at 3-5 minute intervals. If the obstruction is proximal (close to the stomach), vomiting may be profuse and not usually associated with distension. Distal obstruction (closer to the colon or involving the colon itself) will present with less vomiting which may contain fecal-smelling material and will be associated with distension as intestinal gas and liquid contents accumulate behind the obstruction. Diarrhea may be evident early and, if the obstruction is complete, followed by failure to pass either flatus or feces.

The PHYSICAL EXAMINATION will reveal abdominal distension in most cases, abnormal intestinal motility, and dehydration. Auscultation will reveal periods of increased bowel sounds separated by relatively quiet periods. This intermittent pattern will correspond with the patient's cycle of pain. Occasional high-pitched or tinkling sounds are characteristic as small amounts of fluid and gas are allowed to pass the obstruction. Visible peristalsis is pathognomonic of intestinal obstruction. Rectal examination should be performed to detect lesions and test for occult blood (which might indicate the presence of a carcinoma). The white blood cell count will reveal an increased number of neutrophils.

DIFFERENTIAL DIAGNOSIS

Although it is difficult to confuse the classic symptom complex of intestinal obstruction due to its severity and association with distension and other physical findings, confusion may initially exist with these other illnesses:

a. acute appendicitis - see APPEND
b. acute cholecystitis - see CHOLE
c. duodenal perforation - see PERFDU
d. pancreatitis.

d.) Pancreatitis is often associated with duodenal ulcer disease, cholecystitis, trauma, and alcoholism and will present as a boring epigastric pain which penetrates to the back. Signs and symptoms of peritoneal irritation are less pronounced than with intestinal obstruction.

TREATMENT

The aims of treatment of intestinal obstruction are to prevent shock and dehydration and to attempt to relieve distension in preparation for MEDICAL EVACUATION as soon as practical.

Intravenous fluids are utilized to maintain fluid and electrolyte balance in an attempt to counteract the potentially massive fluid shift into the obstructed bowel. D5NS or D5RL should be infused at a base rate of 125-150 ml/hour. Additional fluid replacement should be calculated to compensate for the extra fluid losses from temperature elevation, diaphoresis, emesis, diarrhea, and nasogastric suctioning as well as losses into the distended bowel. Fluid and electrolyte replacement must keep pace with losses to prevent dehydration and electrolyte imbalance. Monitoring of the hematocrit is a good indicator of the adequacy of hydration.

Decompression of the stomach and relief of distension can be accomplished by placement of a nasogastric tube and keeping the patient NPO. Mild intermittent suction (1-3 psi) is most effective and must be coupled with diligent maintenance of patency by PRN irrigation with small amounts of normal saline.

NOTE: Pain medications are contraindicated since they will mask the patient's sensorium and obscure subjective evaluation, thereby masking possible deterioration in the patient's condition.

USUAL COURSE WITH TREATMENT

Intestinal obstruction represents a MEDICAL EMERGENCY requiring IMMEDIATE EVACUATION since there is no reliable way to determine if strangulation (cutting off of the blood supply with subsequent death of the section of bowel involved) has occurred, except surgically. The mortality is minimal if surgical intervention is accomplished early, yet is high if strangulation is not corrected surgically. Although the obstruction might clear spontaneously, this is not the usual case.

COMPLICATIONS AND THEIR MANAGEMENT

Strangulation with or without peritonitis is heralded by a conversion of the pain to a continuous and severe pain, a decrease in abdominal sounds, and association with tachycardia, fever, tachypnea and a general deterioration of the status of hydration and electrolyte balance despite vigorous fluid replacement. This event can be rapidly fatal and the corpsman must be keyed to the prevention of shock and institution of immediate evacuation.

An antibiotic regimen should be initiated. Maintenance of bactericidal blood levels of antibiotics effective against intestinal flora is imperative. Coverage should ideally include the gram negative organisms, the enterococci (Streptococcus fecaelis), and the anaerobes. Coverage should ideally include the gram negative organisms, the enterococci (Streptococcus fecaelis), and the anaerobes. Cephapirin and gentamycin cover these organisms and are recommended as per LANTFLT letter of 7 Oct 85.

In view of its seriousness, deterioration in the patient with intestinal obstruction should be treated with massive doses of antibiotics as follows:

CEPHAPIRIN-GENTAMYCIN REGIMEN:

CEPHAPIRIN - 2 gr q6h IV. (dilute 1 gr in 10 cc sterile water and given slowly over 3-5 minutes, or given with the IV injection. It is also compatible with LR and D5W.)
GENTAMYCIN - 1.5 mg/kg q8h IV or IM. (For IV, dilute with 50-200 ml of IV solution and infuse over 1/2 to 2 hours.)

If cephapirin is not available, a less desired alternative may be used in which ampicillin and gentamycin cover the gram negative organisms and the enterococci while clindamycin covers anaerobes.

AMPICILLIN-GENTAMYCIN-CLINDAMYCIN REGIMEN:

AMPICILLIN - 150 mg/kg/day in equally divided doses q6h IV. (Dilute and infuse as per package insert.)
GENTAMYCIN - 1.5 mg/kg q8h IV or IM. (Dil as before.)
CLINDAMYCIN - 300mg q6h IV. (Dilute in 50 ml of IV solution and infuse over at least 10 minutes.)

If only penicillin and gentamycin are available, the following regimen may be used, although it will be even less effective than the above regimens.

PENICILLIN-GENTAMYCIN REGIMEN:

PENICILLIN - 30 million units per day by IV. (Dilute and infuse as per package insert.)
GENTAMYCIN - 1.5 mg/kg q8h IV. (Dil. per GENT above)

APPENDIX B
Datasheet Definitions

History Page 1

SITE OF PAIN at ONSET definition:

Mark the response in the left column which represents the site at the time of examination. The location of the pain in the appropriate area of the diagram will then be drawn. (Occasionally, pain isn't the first symptom of an illness which later involves abdominal pain. This would require an entry of NO PAIN.)

SITE OF PAIN at PRESENT definition:

Mark the response in the right column which represents the site of pain at the time of examination. The location of the pain in the appropriate area of the diagram will then be drawn.

History Page 2

TYPE OF PAIN definition:

INTERMITTENT
STEADY
COLICKY

A graphic representation of these types of pain is presented below. It's especially important to distinguish between the types of pain. If the pain is constant and present the whole time, mark STEADY on your datasheet. If the pain is present the whole time but varies rhythmically in intensity, mark COLICKY. If your patient has times when he's free of pain, mark INTERMITTENT.

Suggestions for questions to ask. -
'Are you ever free of pain?'

If YES, pain is INTERMITTENT.
If NO, ask next question.
'Does the pain seem to get better then worse in cycles?'

If YES, pain is COLICKY.
If NO, pain is STEADY.

SEVERITY OF PAIN definition:

MODERATE
SEVERE

SEVERE pain is pain that causes the patient obvious distress. Anything else is termed MODERATE. This is a judgment which must be made by the practitioner; don't ask the patient to evaluate the severity of his pain.

AGGRAVATING FACTORS definition:

MOVEMENT
COUGH
BREATHING
FOOD
OTHER
NONE

These are factors which make the pain worse. The patient should be asked about each item specifically. For MOVEMENT and COUGH especially, the patient should be asked to actually MOVE (e.g. turn over) and COUGH to see if these findings are present.

PROGRESS OF PAIN definition:

BETTER
SAME
WORSE

Pain which has subjectively remained unchanged is termed SAME. The categories of BETTER and WORSE refer to subjective changes in pain prior to seeing the practitioner. It is often difficult to evaluate this category since abdominal pain can vary so much. In this instance, don't mark any of the choices. Instead, write 'VARIABLE' on the datasheet and skip this entry when performing data input.

DURATION OF PAIN definition:

12h or less
12-24h
24-48h
48+h

Acute abdominal pain is classically defined as pain beginning less than 48 hours prior to presentation. The term DURATION refers to the length of time which the patient has had the pain during THIS episode. Similar pain in the past (i.e. at some time greater than 48 hours ago), should be considered under the category of PREVIOUS SIMILAR PAIN.

RELIEVING FACTORS definition:

LYING STILL
VOMITING
ANTACIDS
FOOD
OTHER
NONE

These are factors that make the pain subside. The patient should be asked about each item specifically.

History Page 3

NAUSEA definition:

PRESENT
ABSENT

NAUSEA refers to the feeling of being sick to one's stomach. It is possible to have nausea without vomiting and occasionally, vomiting without nausea. This category refers to the entire present episode, not just at the time he is seen by the practitioner.

VOMITING definition:

PRESENT
ABSENT

This category refers to the whole present episode, not just at the time the patient is seen by the practitioner.

BOWELS definition:

NORMAL
CONSTIPATED
DIARRHEA
BLOOD IN STOOL
MUCUS IN STOOL

This category refers to any recent change in the patient's bowel habits. Remember that bowel habits vary widely from one patient to another normally. Most of the datasheet items are self-explanatory. BLOOD IN STOOL refers to either bright red blood (hematochesia) or black, tarry stool (melena). If the duration of the present illness is too short to be certain of a choice from this category, leave the entry blank on the datasheet and skip this category when entering data.

APPETITE definition:

DECREASED
NORMAL

This category is intended to reflect any RECENT CHANGE in the patient's appetite. If he has had a poor appetite for the last ten years, yet there has been no significant change in the last two days, then his appetite is NORMAL.

JAUNDICE definition:

PRESENT
ABSENT

The term JAUNDICE in the history-taking portion refers to a RECENT appearance of yellow color to the patient's skin or sclera as noticed by the patient. Jaundice often indicates problems with the gallbladder, biliary tree, or liver. Mark PRESENT if present now or has been noticed recently by the patient.

URINATION definition:

NORMAL
FREQUENCY
PAINFUL
DARK URINE
BLOOD IN URINE

This category refers to any recent change in urination.

Mark FREQUENCY if the patient relates that he has been urinating more often than usual. DARK URINE may be due to gall bladder illness but occasionally indicates dehydration.

BLOOD IN URINE (either grossly or by Labstix) often indicates a stone in the urinary tract, especially if accompanied by flank pain.

History Page 4

PREVIOUS INDIGESTION definition

YES
NO

PREVIOUS INDIGESTION refers to gastrointestinal upset prior to the present episode.

PREVIOUS SIMILAR PAIN definition:

YES
NO

Mark YES if your patient has had a bout of similar abdominal pain prior to the present episode.

PREVIOUS SURGERY definition:

YES
NO

Mark YES if the patient has had abdominal surgery. Only those operations where the peritoneum was entered should be counted. This includes most surgery done under general or spinal anaesthesia. When in doubt, check the operative report in the patient's health record. NOTE: This does not include repairs of inguinal hernias.

PREVIOUS ILLNESS definition:

YES
NO

This category requires judgment on the part of the practitioner. Mark YES if there are items in the history (including hospitalizations) which are thought to be pertinent to the present illness. If YES, add details to the back of the datasheet.

TAKING MEDICATIONS definition:

YES
NO

Mark YES if your patient is taking medication FOR THIS EPISODE OF PAIN ONLY.

Physical Examination Page 1

TEMPERATURE definition:

Mark the appropriate value in degrees Fahrenheit.

PULSE definition:

Mark the appropriate value in beats per minute.

BLOOD PRESSURE (Systolic) definition:

Mark the appropriate value in mm Hg.

BLOOD PRESSURE (Diastolic) definition:

Mark the appropriate value in mm Hg.

Physical Examination Page 2

MOOD definition:

NORMAL
DISTRESSED
ANXIOUS

Although interpretation of MOOD is very subjective it allows insight into the patient's psychological status. There is a subtle difference between DISTRESSED and ANXIOUS. A patient who is experiencing significant physical symptoms (such as pain, nausea, vomiting) may be DISTRESSED, but the patient who is primarily worried about his illness would be ANXIOUS.

COLOR definition:

NORMAL
PALE
FLUSHED
JAUNDICED
CYANOTIC

FLUSHED, is an important finding but is meaningful only if the patient's environment is not uncomfortably warm, which might cause flushing normally. A patient with JAUNDICE will have yellowish skin and/or sclerae (whites of the eyes). Patients who are CYANOTIC will present with a blue tint, especially around the lips and nailbeds.

In some patients (especially blacks and orientals) these findings are difficult to appreciate; sometimes examination of the sclera and palm creases is helpful. If doubt exists, skip this category on the datasheet and when entering data into the computer.

WHITE BLOOD CELL COUNT definition:

Mark the appropriate numbers.

INSPECTION definition:

NORMAL
VISIBLE PERISTALSIS
DECREASED ABDOMINAL MOVEMENT

Inspection of the abdomen means closely looking at it! If wave-like movement of any area of the abdomen, especially if accompanied by audible rushes or bowel sounds, mark VISIBLE PERISTALSIS.

To observe for DECREASED ABDOMINAL MOVEMENT, the patient should lie on his back with flexed knees while the practitioner holds his hand approximately 1 to 2 inches above the patient's umbilicus. The patient is then asked to raise his belly to touch the practitioner's hand. If the patient has difficulty doing this, mark DECREASED ABDOMINAL MOVEMENT. This sign is an important indicator suggestive of peritonitis.

SCARS definition:

PRESENT
ABSENT

Mark PRESENT if the patient has either surgical scars or scars indicating penetrating trauma to the abdomen.

GUARDING definition:

PRESENT
ABSENT

Guarding is present when there is VOLUNTARY tightening of the abdominal wall muscles, when the practitioner attempts to palpate.

This can often be overcome by tact and gentle persuasion. Guarding must be distinguished from Rigidity, which is INVOLUNTARY tightening of the abdominal muscles and cannot be overcome by tact and gentle persuasion.

RIGIDITY definition:

PRESENT
ABSENT

Rigidity is the INVOLUNTARY tightening of the abdominal wall muscles which CANNOT be overcome with tact and gentle persuasion. It is an important finding since it often indicates peritonitis.

Rigidity must be distinguished from GUARDING, which is VOLUNTARY tightening of the abdominal muscles which CAN be overcome by tact and gentle persuasion.

BOWEL SOUNDS definition:

NORMAL
ABSENT
HYPERACTIVE

This category requires judgment since the difference between normal and abnormal bowel sounds may be difficult to appreciate.

Use this rule: Unless bowel sounds are markedly increased or decreased, mark NORMAL.

Constant gurglings with periods of rushing and tinkling are HYPERACTIVE. Constant gurglings alone are probably NORMAL. Likewise, if, during five minutes of listening, you hear no, or only one or two gurglings, mark ABSENT.

One gurgling per minute, is probably normal.

DISTENTION definition:

PRESENT
ABSENT

Distention is a generalized swelling or bloating of the abdomen and should be distinguished from a mass or localized swelling.

MASSES definition:

PRESENT
ABSENT

MASSES refers to a LOCALIZED swelling, and not a GENERALIZED swelling of the abdomen (which is DISTENTION).

Physical Examination Page 4

TENDERNESS definition:

Mark the appropriate response for the location of most significant tenderness. Fill in the corresponding area on the diagram.

Physical Examination Page 5

MURPHY'S SIGN definition:

PRESENT
ABSENT

MURPHY'S SIGN may be elicited as the practitioner hooks his fingers under the patient's right costal margin at the midclavicular line and asks the patient to inspire

deeply. This is best done with the patient lying on his back with his knees flexed. If the patient exhibits reflex inhibition of inspiration, MURPHY'S SIGN is PRESENT.

REBOUND TENDERNESS definition:

PRESENT
ABSENT

There are three steps to eliciting rebound tenderness:

1. Slowly depress the tender area.
2. Hold until the pain lessens and the patient relaxes.
3. Quickly withdraw to skin level only.

If the patient grimaces or demonstrates other signs of pain upon withdrawal, rebound is present. The practitioner should not have to ask the patient.

This maneuver should be saved for late in the exam, since it is very uncomfortable when present.

RECTAL EXAMINATION definition:

NORMAL
MASS FELT
LEFT TENDER
RIGHT TENDER
GENERAL TENDERNESS

The rectal exam is often neglected for many unprofessional reasons. NO abdominal exam is complete without the rectal examination.

It is important to distinguish between pain and the discomfort which can normally be anticipated. The patient should be verbally prepared for the examination and the practitioner should be as gentle as possible. The patient should be asked if he feels pain as the practitioner moves his finger right, left and centrally. If there is tenderness on both sides, mark GENERAL TENDERNESS even though one side might be more tender than another. (NOTE: directions are in reference to the patient's right and left.)

If the GUAIAC TEST FOR BLOOD is positive, the patient should be examined for obvious sources such as hemorrhoids.

PATIENT NAME:

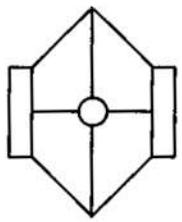
HISTORY

DATE/TIME:

SSN:

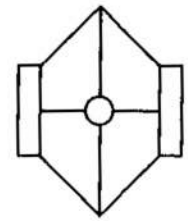
AGE:

PAIN
AT ONSET



- RUQ
- LUQ
- RLQ
- LLQ
- UPPER HALF
- LOWER HALF
- RIGHT HALF
- LEFT HALF
- CENTRAL
- GENERAL
- RIGHT FLANK
- LEFT FLANK
- NO PAIN

PAIN
AT PRESENT



- RUQ
- LUQ
- RLQ
- LLQ
- UPPER HALF
- LOWER HALF
- RIGHT HALF
- LEFT HALF
- CENTRAL
- GENERAL
- RIGHT FLANK
- LEFT FLANK
- NO PAIN

OTHER SYMPTOMS:

NAUSEA:
- PRESENT
- ABSENT

VOMITING:
- PRESENT
- ABSENT

BOWELS:
(recent change)
- NORMAL
- CONSTIPATED
- DIARRHEA
- BLOOD IN STOOL
- MUCUS IN STOOL

APPETITE:
(recent change)
- DECREASED
- NORMAL

JAUNDICE:
(history of yellow color to skin or sclera)
- PRESENT
- ABSENT

URINATION:
- NORMAL
- FREQUENCY
- PAINFUL
- DARK URINE
- BLOOD IN URINE

TYPE OF PAIN:
(at times free of pain = intermittent; constant = steady; constant and varying in intensity = colicky)
- INTERMITTENT
- STEADY
- COLICKY

SEVERITY OF PAIN:
(do not ask; obvious distress = severe; everything else = moderate)
- MODERATE
- SEVERE

AGGRAVATING FACTORS:
(have the patient move and cough)
- MOVEMENT
- COUGH
- BREATHING
- FOOD
- OTHER
- NONE

PROGRESS OF PAIN:
(at time of examination)
- BETTER
- SAME
- WORSE

DURATION OF PAIN:
- 12 H OR LESS
- 12 - 24 H
- 24 - 48 H
- 48+ H

RELIEVING FACTORS
- LYING STILL
- VOMITING
- ANTACIDS
- FOOD
- OTHER
- NONE

PAST HISTORY

PREVIOUS INDIGESTION:
- YES
- NO

PREVIOUS SIMILAR PAIN:
- YES
- NO

PREVIOUS SURGERY:
(abdominal surgery or trauma - must be intraperitoneal)
- YES
- NO

PREVIOUS ILLNESS:
(any pertinent illness, not just abdominal; i.e. requiring hospitalization)
- YES
- NO

TAKING MEDICATIONS:
(medication for this pain only)
- YES
- NO

PLEASE TURN OVER FOR PHYSICAL EXAM PORTION.

PHYSICAL EXAM

VITAL SIGNS

TEMPERATURE:
- < 98.6
- 98.6 - 100.2
- 100.3 - 102
- > 102

PULSE RATE:
- < 80
- 80 - 99
- > 99

BLOOD PRESSURE (SYSTOLIC):
- < 90
- 90 - 129
- > 129

BLOOD PRESSURE (DIASTOLIC):
- < 70
- 70 - 89
- > 89

GENERAL/LAB

MOOD:
(don't ask; obvious distress or physical symptoms = distressed; just worried about illness = anxious)
- NORMAL
- DISTRESSED
- ANXIOUS

COLOR:
(consider environmental temp.; check conjunctiva & palms on black & oriental)
- NORMAL
- PALE
- FLUSHED
- JAUNDICED
- CYANOTIC

WBC COUNT:
- < 8,000
- 8,000 - 10,000
- 10,100 - 12,000
- 12,100 - 15,000
- > 15,000

ABDOMINAL EXAM

INSPECTION:
(wavelike movement = visible persistalsis; pt unable to touch hand with belly button = decreased/absent)
- NORMAL
- VISIBLE PERSISTALSIS
- DECREASED ABD. MOVEMENT

SCARS:
- PRESENT
- ABSENT

GUARDING:
(voluntary tightening of abdominal muscles; can relax with gentle persuasion)
- PRESENT
- ABSENT

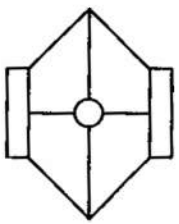
RIGIDITY:
(involuntary tightening of abdominal muscles; cannot relax with gentle persuasion)
- PRESENT
- ABSENT

BOWEL SOUNDS:
(normal unless markedly hyperactive or absent)
- NORMAL
- ABSENT
- HYPERACTIVE

DISTENTION:
(generalized swelling or bloating of entire abdomen)
- PRESENT
- ABSENT

MASSES:
(localized swelling)
- PRESENT
- ABSENT

TENDERNESS:
(area of most significant pain; palpate most painful area last)



- RUQ
- LUQ
- RLQ
- LLQ
- UPPER HALF
- LOWER HALF
- RIGHT HALF
- LEFT HALF
- CENTRAL
- GENERAL
- RIGHT FLANK
- LEFT FLANK
- NO PAIN

MURPHY'S SIGN:
(pt on back with knees bent; hook fingers under pt's right costal margin at mid-clavicular line; severe pain on inspiration and reflex inhibition of inspiration = Murphy's Sign PRESENT)
- PRESENT
- ABSENT

REBOUND TENDERNESS:
(do late in exam; slowly depress tender area, hold until pt relaxes then quickly withdraw hand to skin level; pt grimace = YES rebound)
- PRESENT
- ABSENT

RECTAL EXAM:
(distinguish between pain and discomfort)
- NORMAL
- MASS FELT
- LEFT TENDER
- RIGHT TENDER
- GENERAL TENDERNESS

CORPSMAN'S EVALUATION

MARK YOUR DIAGNOSIS:

( ) APPENDICITIS
( ) NONSPECIFIC, NONSURGICAL ABDOMINAL PAIN
( ) RENAL COLIC
( ) PERFORATED DUODENAL ULCER
( ) CHOLECYSTITIS
( ) SMALL BOWEL OBSTRUCTION
( ) OTHER (specify)

MARK YOUR RECOMMENDATION:

( ) EVACUATION
( ) NO EVACUATION

YOUR TREATMENT:

( ) OBSERVE ONLY
( ) MEDICATE
( ) PROCEDURE

DATA SHEET SEEN BY C.O.?:

( ) YES
( ) NO

RECOMMENDATION OF MEDICAL OFFICER:

( ) EVACUATION
( ) ABD PAIN TX
( ) TX FOR OTHER
( ) RETURN TO DUTY
( ) NOT CONSULTED

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(Note. Letters refer to Appendices A - C. Underlining marks a section as listed in the Table of Contents.)

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UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER NSMRL Report No. 1105	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE *(and Subtitle)* ABDX - A DECISION SUPPORT SYSTEM FOR THE MANAGEMENT OF ACUTE ABDOMINAL PAIN - USER'S MANUAL		5. TYPE OF REPORT & PERIOD COVERED Interim report 6. PERFORMING ORG. REPORT NUMBER NSMRL Report No. 1105
7. AUTHOR*(s)* LCDR David Southerland, MC, USNR, and Karen Fisherkeller		8. CONTRACT OR GRANT NUMBER*(s)*
9. PERFORMING ORGANIZATION NAME AND ADDRESS Behavioral Sciences Department Naval Submarine Medical Research Laboratory Naval Submarine Base New London Groton, CT 06349-5900		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS M0095.005-5010
11. CONTROLLING OFFICE NAME AND ADDRESS Naval Medical Research & Development Command NMCNCR, Bethesda, MD 20814-5044		12. REPORT DATE 10 November 1987 13. NUMBER OF PAGES 29 + 38 appendix pages
14. MONITORING AGENCY NAME & ADDRESS*(If different from Controlling Office)*		15. SECURITY CLASS. *(of this report)* Unclassified 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT *(of this Report)*

Approved for public release; distribution unlimited.

17. DISTRIBUTION STATEMENT *(of the abstract entered in Block 20, if different from Report)*

18. SUPPLEMENTARY NOTES

19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Medical computer applications; Military medicine; Clinical medicine; Diagnosis; Treatment; Decision Making; Information Systems; Internal Medicine; Abdomen; MEDIC; Computer

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

This user's manual is designed to accompany the ABDX system implemented on MS-DOS computers. The manual replaces the previous manual which was designed for use on the Tektronix 4051. The manual contains introductory information, a description of equipment needed, an overview of the different parts of the system, a list of definitions, a list of the treatment protocols, a simple tutorial, and a sample datasheet.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE
S/N 0102-014-6601

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