



RESOURCE AND PATIENT MANAGEMENT SYSTEM

PCC Health Summary System

(APCH)

Technical Manual

Version 2.0
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Preface

The PCC Health Summary is the primary output from the RPMS Patient Care Component (PCC). The health summary is a structured summary of each patient's health history and includes a problem list, lab results, most recent medications, immunization history, health maintenance reminders, and many other data items. A health summary can be produced any time a patient is seen at a facility. Health-care providers can easily design or customize their own health summary types using a menu-driven health summary development module.

This manual contains the technical documentation for the PCC Health Summary system, version 2.0. Included here are a system description, routine descriptions, option descriptions, and a variety of other information necessary for use by IRM personnel to operate and maintain the PCC Health Summary system software.

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1.0 Introduction

The richness of the Patient Care Component (PCC) database, as well as the functional need for an organized presentation of a patient's medical history, has led to the development of a special type of report called the health summary. The PCC Health Summary System User's Manual describes the basic concepts of health summaries, provides instructions on how to generate them, and offers detailed information on the process of constructing new types of health summaries. This technical manual is a reference for developers who will maintain or enhance the Health Summary system. Included are a description of the files and overall program structure. It is assumed that you are already familiar with the material in the user's guide.

The main menu for the Health Summary system (APCHMENU) is shown below.

```

*****
**      IHS Health Summary      **
*****
                          Version 2.0

                          SELLS HOSPITAL/CLINIC

HS      Generate Health Summary
BRHS    Browse Health Summary
MHS     Generate Multiple Health Summaries
CRHS    Health Summary Displaying CMS Register(s)
INHS    Health Summary for Inactive Patient
BLD     Build Health Summary ...
HSM     Health Summary Maintenance ...

```

Each of the above options can be placed on a user's menu without assigning APCHMENU. These options are briefly described below:

Option	Name	What It Does
HS	Generate Health Summary	This is the most commonly used option and allows the user to print a health summary for one patient.
BRSH	Browse Health Summary	This option is used to browse through a health summary on the CRT screen.
MHS	Generate Multiple Health Summaries	The Generate Multiple Health Summaries option provides a means for generating health summaries for many patients, or a template of patients, at the same time.
CRHS	Health Summary Displaying CMS Register(s)	This option enables a user to determine which type of health summary is the best one to generate for a particular patient. The CRHS option displays the names of the registers of which the patient is a member. The user can then select and generate the most appropriate health summary type for the patient.
INHS	Health Summary for Inactive Patient	This option allows the printing of a health summary for an inactive patient.

Option	Name	What It Does
BLD	Build Health Summary	Access to the Build Health Summary menu is normally given to any user who has the authority to construct or modify health summary types. Below shows the Build Health Summary menu.
HSM	Health Summary Maintenance	The Health Summary Maintenance menu contains a super-set of the Build Health Summary menu options, including programmer-level options that will normally be given to supervisory users only. The Health Summary Maintenance menu is shown below.

The following shows the options on the Build Health Summary Menu

```

*****
**      IHS Health Summary      **
**      Build Health Summary Menu  **
*****
Version 2.0

SELLS HOSPITAL/CLINIC

IS   Inquire About a Health Summary Type
PP   Print Health Maintenance Item Protocols
LS   List Health Summary Types
LC   List Health Summary Components
LM   List Measurement Panel Types
LF   List Health Summary Flowsheets
LI   List Health Summary Flowsheet Items
MS   Create/Modify Health Summary Type
MM   Create/Modify Measurement Panel
MF   Create/Modify Flowsheet
HS   Generate Health Summary
BRHS Browse Health Summary

```

The following shows the options on the Health Summary Maintenance Menu:

```
*****  
**          IHS Health Summary          **  
** Health Summary Maintenance Menu **  
*****  
Version 2.0  
  
SELLS HOSPITAL/CLINIC  
  
IS   Inquire About a Health Summary Type  
PP   Print Health Maintenance Item Protocols  
LS   List Health Summary Types  
LC   List Health Summary Components  
LM   List Measurement Panel Types  
LF   List Health Summary Flowsheets  
LI   List Health Summary Flowsheet Items  
MS   Create/Modify Health Summary Type  
MM   Create/Modify Measurement Panel  
MF   Create/Modify Flowsheet  
MI   Create/Modify Flowsheet Item  
DS   Delete Health Summary Type  
DM   Delete Measurement Panel Definition  
DF   Delete Health Summary Flowsheet  
DI   Delete Health Summary Flowsheet Item  
HS   Generate Health Summary
```

2.0 Implementation and Maintenance

2.1 General Information

The Health Summary subsystem occupies the APCHS portion of the APC namespace. Options, security locks/keys, templates, routines, and globals are namespaced. Keep in mind, however, that the Kernel supports only four-character namespaces, so APCH is the package prefix.

Menu options allow users to retrieve summaries individually or in batches; queuing is supported, as is output to either printers or CRT terminals. Menus provide access to the functions needed to construct new summary types. Overtly destructive options (such as deleting a summary type) or relatively technical options that require programmer intervention (for example, adding a new component) are isolated on a locked supervisor's menu. A programmer-callable entry point is also provided to support applications that may include an option to generate health summaries.

In order to provide the user with maximum flexibility to tailor existing summaries and create new summary types, File Manager files store the definitions of summary types and measurement panels, which are independent entities that may be referenced on multiple summaries and the inventory of components from which summaries may be built.

The health summary is produced through the execution of a series of code segments that independently produce the text output for each section of the summary. Each component of the summary has such a code segment. Adding a new component implies writing a MUMPS program.

2.2 System Requirements

- Kernel 8.0 or higher
- FileMan 21 or higher
- PCC Management Reports Version 3.0
- Taxonomy System Version 5.1
- XB/ZIB Utilities Version 3.0

2.3 Security Keys

APCHZMENU - Permits access to top-level menu (APCHMENU).

APCHZMGR - Permits access to supervisory-level options.

APCHZ CONFIDENTIAL - Distributed for convenience of sites; may be used to lock summary components that are deemed too confidential to display routinely.

3.0 Routines

Grouped Routines	Description
APCHS, APCHS0, APCHSBRW	Driver programs
APCHSM	Summary batch generator
APCHS1-n	Summary components
APCHSUTL	Shared utilities
APCHSBAN	Generates banners for menu options
APCHSDOC	Documentation routine

The driver program for the health summary is APCHS. In general, its operation is as follows:

```

Initialize environment
  Loop:
    Select summary type, exit if none selected.
      Loop:
        Select patient, exit if none selected.
        Select output device (supports queuing and space-bar convention).
        Call common code to produce summary.
Common code to produce summary:
  Initialize page break code and header/trailer.
  Loop:
    Select next segment from summary type file.
    If not locked, or user holds lock:
      Set up title.
      Set up segment restrictions.
      Invoke segment code.
  
```

Routines	Description
APCHS	Main driver routine <ul style="list-style-type: none"> • Summary type selection • Device selection/queuing
APCHS0	Extension of main driver
APCHSM	Multiple summary driver
APCHSBRW	Browse health summary
APCHS1	Summary segments–Demographics
APCHS1A	<ul style="list-style-type: none"> • Brief Demographics • Directions to the patient's home
APCHS2	<ul style="list-style-type: none"> • Measurements (nontabular form) • Immunizations • Skin tests
APCHS2A	Measurements (tabular)
APCHS2A1	Computations for measurement transforms
APCHS2A2	Ht/Wt percentile computation
APCHS2A3	BMI/RW computation
APCHS2B	Outpatient Encounters
APCHS2C	Inpatient Encounters
APCHS2D	Scheduled Encounters
APCHS3	Lab Results (tabular)
APCHS3A	Most Recent Lab Results

Routines	Description
APCHS3C	<ul style="list-style-type: none"> • Most Recent Radiology Studies • Most Recent Exams
APCHS4	<ul style="list-style-type: none"> • Problem List/Notes • Allergies
APCHS5	Insurance
APCHS5A	Third-party information
APCHS6	<ul style="list-style-type: none"> • Family History • Personal History • History of Surgery
APCHS7*	Medications
APCHS8	<ul style="list-style-type: none"> • Offspring History • Reproductive History • Treatments
APCHS8A	Eyeglass Prescriptions
APCHS9	<ul style="list-style-type: none"> • Dental Services • Mental Health/Social Services • CHR
APCHS10	<ul style="list-style-type: none"> • Patient Education • Most Recent Patient Education
APCHS11*	Surveillance driver, components
APCHS12*	Flowsheets
APCHSUTL	Utilities: get ICD text, print ICD, print text, get narrative, get site name
APCHSBAN	Banner generation for menu options
APCHSDOC	Documentation routine

3.1 Callable Routines

The Health Summary system has several public entry points, which are listed here.

EN^APCHS – may be called to produce a summary. Required parameters are:

1. APCHSPAT pointing to the patient for whom the summary is to be generated. (Since File 2 and 9000001 are DINUM, the entry number will be the same.)
2. APCHSTYP set to the entry number in the Health Summary Type file corresponding to the type of summary to generate.
3. DUZ and DUZ(2) set appropriately.
4. IO parameters as set by %ZIS.

APCHS also contains a utility entry point BREAK, which is called from the various segments to produce a section break with the appropriate header, etc.

EOJ^APCHS – cleans up all APCH variables.

PRTTXT^APCHSUTL – prints text.

GETMEDS(DFN,Y,Z,SIGT) - returns array of medications.

4.0 Files

File #	Global	File Name	Description
9001015	APCHSCTL	Health Summary Type **	This file contains the definitions of summary types, including structure (component order, component, occurrence/time window restriction, and alternate title) and controls for display of ICD text and provider narrative. The component field within the structure multiple points to the file of health summary components. In addition, fields outside the structure multiple support display controls for specific components if they are selected to be a part of a summary type. These include: measurement panel, selective lab results, flowsheets, health factors, and health maintenance reminders. Each of these fields points to a corresponding file
9001016	APCHSCMP	Health Summary Component **	This file contains the definitions for the components from which health summaries may be constructed. These include the component name that appears on the summary, the entry points into the routines that produce the appropriate part of the health summary (in the form label;routine to avoid introducing "hat" characters into the file), and an optional lock that prevents display of the component on a summary generated by anyone not holding the key.
9001017	APCHSMPN	Health Summary Meas Panel **	This file contains the definitions of measurement panels. The information is primarily structural: order of display of the measurements within the panel, measurement type, and field specification (discussed in the user's guide). The transform field allows measurement values to be manipulated in arbitrary ways. This capability is used to create percentiles, metric measurements, and compute body mass index and relative weight. The measurement type field, referred to as the panel component, points to the MEAS TYPE file (9999999.07) in order to constrain the allowable measurement types.
9001018	APCHSURV	Health Summary Maint Item **	This file contains the names of health maintenance reminders that may be selected to appear in the health maintenance component, as well as the entry points into the routines that will produce the appropriate part of the health summary (in the form label;routine to avoid introducing "hat" characters into the file).

File #	Global	File Name	Description
9001019	APCHSFLI	Health Summary Flowsheet Items **	This file stores the definitions of the items from which health summary flowsheets can be built, including the MUMPS code necessary to extract a value to display and the "type" of item within a heterogeneous file (for example, measurement type).
9001020	APCHSFLC	Health Summary Flowsheet	This file contains the structure definitions for flowsheets that can be embedded in PCC health summaries.
9001021	APCHSPER	Health Summary Percentiles **	This file contains age-grouped percentile data for height and weight measurements. Data originally obtained from 1959 curves for PCIS.
9001022	APCHSUP	Health Summary Supplements	This file contains the supplements.

** Data is distributed with this file.

5.0 Cross-References

```
9001015    HEALTH SUMMARY TYPE
.01        NAME
           9001015^B

9001016    HEALTH SUMMARY COMPONENT
.01        NAME
           9001016^B

9001017    HEALTH SUMMARY MEAS PANEL
.01        NAME
           9001017^B

9001018    HEALTH SUMMARY MAINT ITEM
.01        NAME
           9001018^B

9001019    HEALTH SUMMARY FLOWSHEET ITEMS
.01        NAME
           9001019^B

9001020    HEALTH SUMMARY FLOWSHEET
.01        NAME
           9001020^B

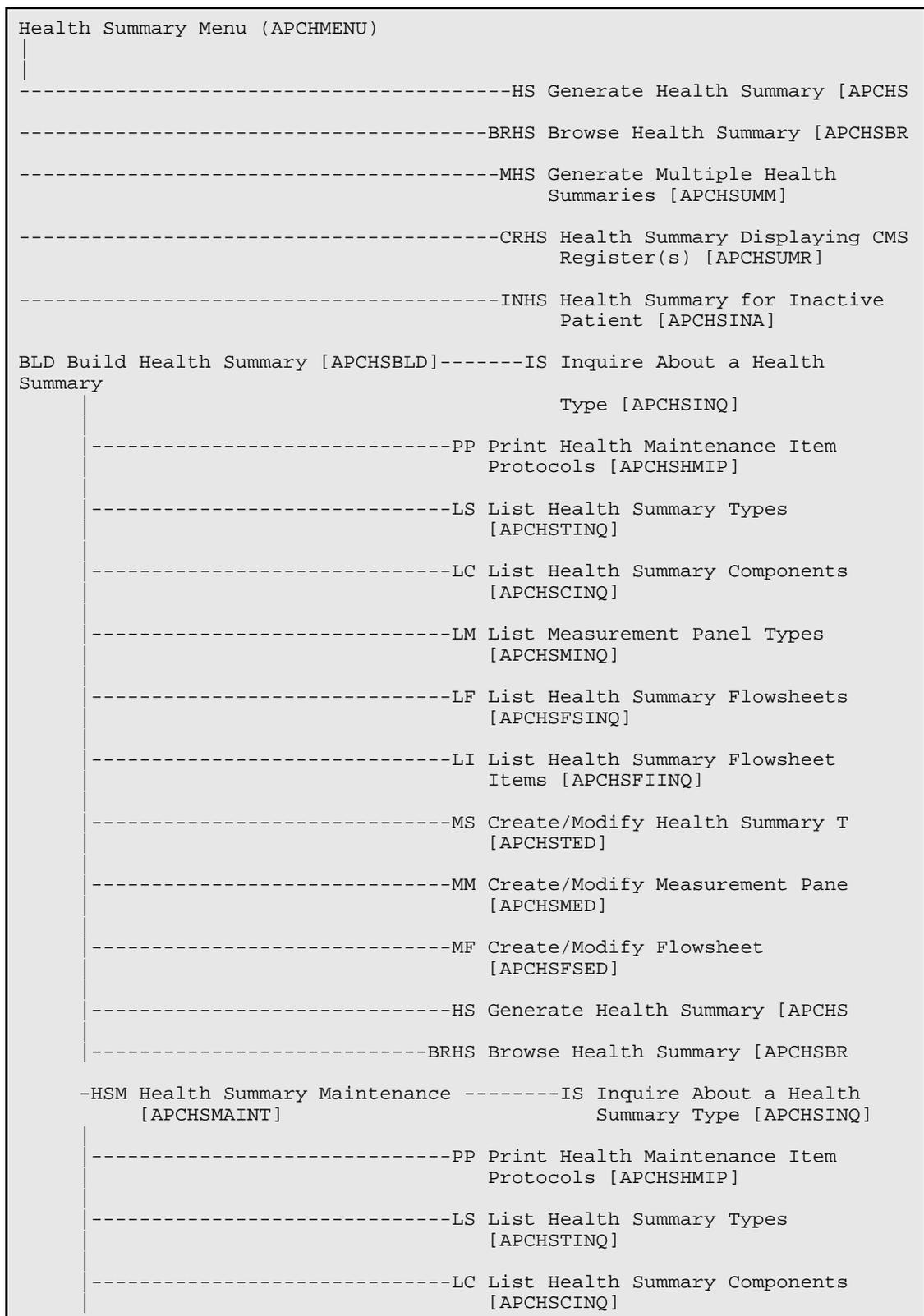
9001021    HEALTH SUMMARY PERCENTILES
.01        MEASUREMENT
           9001021^B
```

6.0 Exported Options

Option	Description
APCHMENU	This menu is included only to comply with verification requirements. It is locked with the APCHZMENU key, also included only for verification requirements. It is not expected that this menu, or the key, will ever be assigned, since the two options on this menu are ordinarily assigned directly to or appear as part of the PCC user menus.
APCHSBLD	Submenu for nondestructive health summary maintenance functions.
APCHSBRW	This option allows the user to display a health summary using the Browse feature.
APCHSCINQ	From the "B" index on Health Summary component, displays available components from which a summary can be built.
APCHSFIDEL	Uses the APCH Delete Health Summary Flowsheet Item template to delete an entry from the Health Summary Flowsheet Item file. Locked with the APCHZMGR key.
APCHSFIED	Uses the APCH Edit Health Summary Flowsheet Item template to create or modify a flowsheet item definition in the Health Summary Flowsheet Items file. Locked with the XUPROG key.
APCHSFIINQ	From the "B" index on Health Summary Flowsheet Items, displays available components from which a flowsheet may be built.
APCHSFSDEL	Uses the APCH Delete Health Sum Flowsheet template to delete an entry from the Health Summary Flowsheet file. Locked with the APCHZMGR key.
APCHSFSED	Uses the APCH Edit Health Sum Flowsheet template to create or modify a flowsheet definition in the Health Summary Flowsheet file.
APCHSFSINQ	From the "B" index on Health Summary Flowsheets, displays available components from which a summary may be built.
APCHSHMIP	Prints all items with their associated descriptions in the Health Maintenance Item file.
APCHSINA	Allows lookup of inactive patients, which is usually not allowed, by setting AUPNLK(INAC) before calling the Health Summary program.
APCHSINQ	An "inquire" option against the Health Summary Type dictionary to allow the user to view the structure of a summary type.
APCHSMAINT	Submenu for health summary maintenance functions: Edit Health Summary Component file Edit Health Summary Type file
APCHSMDEL	Invokes APCH Del Health Sum Meas Panel template to delete health summary measurement panel definitions (Health Summary Measurement Panels file). Locked with the APCHZMGR key.
APCHSMED	Invokes APCH Edit Health Sum Meas Panel template to allow creation or editing of measurement panels (prototype definitions that control the content and ordering of a panel of measurements).
APCHSMINQ	Displays measurement panel types from "B" index on Health Summary Meas Panel file.
APCHSTDEL	Invokes APCH Delete Summary Type template to delete a health summary. A separate option (APCHSTED) is available to edit summary types. Locked with the APCHZMGR key.
APCHSTED	Invokes APCH Edit Health Summary Type template to create/edit a health summary type. A separate option (APCHSTDEL) is available to delete a health summary type.
APCHSTINQ	Displays health summary types from "B" index on Health Summary Type file.

Option	Description
APCHSUM	Invokes APCHS to generate health summary, either printed or CRT display version. Requires presence of the following dictionaries: <ul style="list-style-type: none"> • Health Summary Type • Health Summary Component • Health Summary Measurement Panels (if measurement panels are used) • Health Summary Maint Item (if health maintenance reminders are used) • Health Summary Flowsheet Items (if flowsheets are used) • Health Summary Flowsheet Items (if flowsheets are used) • Health Summary Percentiles (if measurement panels containing percentiles are used)
APCHSUMM	This option generates health summaries for any number of patients.
APCHSUSER	Top-level menu for access to health summary system, including both generation and maintenance.
APCHSUMR	This option generates health summaries displaying any Case Management System register(s) in which the patient is enrolled.

7.0 Menu Diagram



```

----- [APCHSMINQ]
-----LF List Health Summary Flowsheets
      [APCHSFSINQ]
-----LI List Health Summary Flowsheet
      Items [APCHSFIINQ]
-----MS Create/Modify Health Summary T
      [APCHSTED]
-----MM Create/Modify Measurement Pane
      [APCHSMED]
-----MF Create/Modify Flowsheet
      [APCHSFSED]
-----MI Create/Modify Flowsheet Item
      [APCHSFIED]
-----DS Delete Health Summary Type
      [APCHSTDEL]
-----DM Delete Measurement Panel
      Definition [APCHSMDEL]
-----DF Delete Health Summary Flowsheet
      [APCHSFSDEL]
-----DI Delete Health Summary Flowsheet
      Item [APCHSFIDEL]
-----HS Generate Health Summary [APCHS

```

8.0 Archiving and Purging

There is no archiving and purging in this package.

9.0 External Relations

This package calls the following documented entry points:

^AMHHS

^AMCHPCC

PCC^ADERVW

^APCLDF

DOB^AUPNPAT

DOD^AUPNPAT

KILL^AUPNPAT

CHR^BCHDHS

HS^BMCHS

BNEED^BWUTL1

CNEED^BWUTL1

10.0 Internal Relations

All users should be given the access to the appropriate options and keys to them, as needed. All of the options in this system stand alone.

11.0 How to Generate On-Line Documentation

The file number range for this package is 9001015-9001021. The namespace is APCH. All templates, routines, screen forms, etc. begin with APCH.

This section describes some of the methods by which users can generate Health Summary system technical documentation. Online technical documentation pertaining to the Health Summary software, in addition to that which is located in the help prompts and on the help screens throughout the Health Summary package, can be generated through the use of several Kernel options. These include, but are not limited to, the following:

- %INDEX
- Menu Management
- Inquire Option
- Print Option File
- VA FileMan
- Data Dictionary Utilities
- List File Attributes

Entering question marks at the “Select...Option” prompts can also provide users with valuable technical information. For example, a single question mark (?) lists all options that can be accessed from the current option. Entering two question marks (??) lists all options accessible from the current one, showing the formal name and lock for each. Three question marks (???) displays a brief description for each option in a menu, whereas an option name preceded by a question mark (?OPTION) shows extended help, if available, for that option.

For a more exhaustive option listing and further information about other utilities that supply online technical information, please consult the DHCP Kernel Reference manual.

11.1 %INDEX

This option analyzes the structure of a routine to determine in part if the routine adheres to RPMS Programming Standards. The %INDEX output can include the following components:

- Compiled list of errors and warnings
- Routine listing

- Local variables
- Global variables
- Naked globals
- Label references
- External references

By running %INDEX for a specified set of routines, you are afforded the opportunity to discover any deviations from RPMS Programming Standards that exist in the selected routines and to see how routines interact with one another (i.e., which routines call or are called by other routines).

To run %INDEX for the Health Summary package, specify the APCH namespace at the Routine(s)?> prompt.

Note: Health Summary initialization routines that reside in the UCI in which %INDEX is being run, compiled template routines, and local routines found within the APCH namespace should be omitted at the Routine(s)?> prompt. To omit routines from selection, preface the namespace with a minus sign (-).

11.2 Inquire Option

This menu management option provides the following information about a specified option:

- Option name
- Menu text
- Option description
- Type of option
- Lock (if any)

In addition, all items on the menu are listed for each menu option. To secure information about Health Summary options, you must specify the APCH namespace.

11.3 Print Option File

This utility generates a listing of options from the Option file (#19). You can choose to print all of the entries in this file or you can specify a single option or range of options. For a list of Health Summary options, please refer to the Exported Options section of this manual.

11.4 List File Attributes

This VA FileMan option allows you to generate documentation pertaining to files and file structure. Using the Standard format of this option yields the following data dictionary information for a specified file:

- File name and description
- Identifiers
- Cross-references
- Files pointed to by the file specified
- Files that point to the file specified
- Input, print, and sort templates

In addition, the following applicable data is supplied for each field in the file:

- Field name, number, title, and description
- Global location
- Help prompt
- Cross-references
- Input transform
- Date last edited
- Notes

Using the Global Map format of this option generates an output that lists the following information:

- All cross-references for the file selected
- Global location of each field in the file
- Input, print, and sort templates

For a comprehensive listing of Health Summary package files, please refer to the Files section of this manual.

12.0 SAC Requirements/Exemptions

There were no exemptions necessary for this package.

13.0 Glossary

Archiving

The storing of historical or little-used data off-line (often on tape).

Banner

A line of text with a user's name and domain.

Browser

An interactive application that displays ASCII text on a terminal that supports a scroll region. The text can be in the form of a word-processing field or sequential local or global array. The user is allowed to navigate freely within the document.

Callable Entry Points

Places in a routine that can be called from an application program.

Component

A segment of the health summary that provides a mechanism for grouping data into sections.

Cross-reference

An indexing method whereby files can include pre-sorted lists of entries as part of the stored database. Cross-references (x-refs) facilitate look-up and reporting.

Entry Point

Entry point within a routine that is referenced by a "DO" or "GOTO" command from a routine internal to a package.

File

A set of related records or entries treated as a single unit.

FileMan

The database management system for RPMS.

Flowsheet

A tabular format for organizing and displaying data in a special section of the health summary.

Global

In MUMPS, global refers to a variable stored on disk (global variable) or the array to which the global variable may belong (global array).

Health Summary

A summary of a patient's demographic and clinical information that has been compiled from information in the Patient Care Component (PCC) database of the Resource and Patient Management System (RMPS).

ICD

International Classification of Diseases.

INDEX (%INDEX)

A Kernel utility used to verify routines and other MUMPS code associated with a package. Checking is done according to current ANSI MUMPS standards and RPMS programming standards. This tool can be invoked through an option or from direct mode (>D ^%INDEX).

Init

Initialization of an application package. The initialization step in the installation process builds files from a set of routines (the init routines). Init is a shortened form of initialization.

Internal Entry Number (IEN)

The number used to identify an entry within a file. Every record has a unique internal entry number.

IRM

Information Resource Management. The IHS personnel responsible for information systems management and security.

Kernel

The set of MUMPS software utilities that function as an intermediary between the host operating system and application packages, such as Laboratory and Pharmacy. The Kernel provides a standard and consistent user and programmer interface between application packages and the underlying MUMPS implementation. These utilities provide the foundation for RPMS.

Menu

A list of choices for computing activity. A menu is a type of option designed to identify a series of items (other options) for presentation to the user for selection. When displayed, menu-type options are preceded by the word “Select” and followed by the word “option” as in Select Menu Management option: (the menu’s select prompt).

Namespace

A unique set of 2 to 4 alpha characters that are assigned by the database administrator to a software application.

Option

An entry in the Option file. As an item on a menu, an option provides an opportunity for users to select it, thereby invoking the associated computing activity. Options may also be scheduled to run in the background, non-interactively, by TaskMan.

Panel

A tabular format for presenting a series of clinical measurements or results in the health summary.

Patient Care Component (PCC)

The central repository for data in the Resource and Patient Management System (RPMS).

Queuing

Requesting that a job be processed at a later time rather than within the current session.

Routine

A program or sequence of instructions called by a program that may have some general or frequent use. MUMPS routines are groups of program lines that are saved, loaded, and called as a single unit via a specific name.

UCI

User Class Identification: a computing area.

Up-Hat (^)

A circumflex, also know as a “hat” or “caret,” that is used as a piece delimiter in a global. The up-hat is denoted as “^” and is typed by pressing Shift+6 on the keyboard.

Utility

A callable routine line tag or function. A universal routine usable by anyone.

Variable

A character or group of characters that refers to a value. MUMPS recognizes 3 types of variables: local variables, global variables, and special variables. Local variables exist in a partition of the main memory and disappear at sign-off. A global variable is stored on disk, potentially available to any user. Global variables usually exist as parts of global arrays.