



RESOURCE AND PATIENT MANAGEMENT SYSTEM

Diabetes Management System (BDM)

Technical Manual

Version 2.0
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PREFACE

The existing RPMS Diabetes Management System has been modified and a comprehensive training program has been developed. The new Diabetes Management System is patient-centered. In addition, it provides the capability to monitor the overall effectiveness of a diabetic program using an automated audit system. It has been designed as a supplement to the Case Management System and PCC Management Reports that have been used together in the past to meet these needs.

This manual contains the technical documentation for the PCC Diabetes Management System v2.0. Included here are a system description, routine descriptions, option descriptions, and other information necessary for use by IRM personnel to operate and maintain the PCC Diabetes Management System software.

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1.0 Introduction

The Diabetes Management System (DMS) facilitates retrieval of information about diabetic patients and provides tools to assess the overall effectiveness of a diabetic program. In addition to its patient-focused functionality, the DMS replaces previous options of the Case Management System and PCC Management Reports.

The most significant enhancement to version 2.0 is the incorporation of the new Graphical User Interface (GUI) capability – Visual Diabetes Management System.

This distribution of the Diabetes Management System (BDM) contains Version 2.0 of Diabetes Management System and the Graphical User Interface (GUI) front end to the system. You can install just the backend (i.e. the “roll and scroll”) version 2.0 of the package or you can install both. There is no requirement to install the GUI front end. Please install version 2.0 of BDM (bdm_0200.k) at all sites regardless of whether the site opts to install and use the GUI portion of the package. Version 2.0 of BDM and the GUI front end have different requirements, so please take note of the requirements section for each piece of the software.

All of the following features of the original Diabetes Management System are retained:

- A Diabetes Register using the PCC Case Management System.
- A Diabetes Flowsheet included on the PCC Health Summary.
- Monitoring and prompting of important care items on the Health Summary.
- Standard nomenclature for recording diabetes exams and education on PCC forms.
- An automated Diabetes Program Audit report.
- Case Management System report options.
- Access to all PCC clinical data.
- Email bulletins identifying newly diagnosed diabetic patients or those with new complications.

The new patient-focused system provides the following additional features:

- Automatic installation of the IHS Diabetes Register if it has not already been installed at a site.
- Automatic installation of the IHS Pre-Diabetes Register if it has not already been installed at a site.
- Patient-focused case review and reporting.
- Simplified creation of taxonomies of medications, laboratory tests, diagnoses,

exams, and procedures required by the Diabetes Management System.

- An automated Diabetic Program Audit report that can be generated for an individual patient, a template of patients, the entire IHS Diabetic Register at a facility, or for a random sample of patients from the Register.
- A Diabetes Patient Care Summary.
- Entry of a Register as the Subject for QMan searches.

The system capitalizes on data contained in the PCC and minimizes redundant data entry for local Diabetes Coordinators. Detailed instructions for implementing and utilizing the Diabetes Management System's features are included in the user manual.

2.0 Main Menu

The following is the main menu for the Diabetes Management System:

```
THIS SYSTEM CONTAINS CONFIDENTIAL PATIENT INFORMATION
COVERED BY THE PRIVACY ACT.  UNAUTHORIZED USE OF THIS
DATA IS ILLEGAL

*****
**                      DIABETES MANAGEMENT SYSTEM          **
*****

VERSION 2.0
SELLS HOSPITAL
CURRENT USER: BILL MARTIN

MAIN MENU

You have access to the IHS DIABETES register,

PM          Patient Management
RP          Reports ...
RM          Register Maintenance ...
DEL         Delete Patient from the Register
LM          ADD/EDIT DMS Letters
SR          Switch to another DIABETES Register
BHS         Browse Health Summary
DA          Diabetes Audit
DMU         Update Diabetes Patient Data
HS          Generate Health Summary
MHS         Generate Multiple Health Summaries
QMAN        Q-Man (PCC Query Utility)

Select Diabetes Management System Option:
```

Figure 2-1: DMS main menu

3.0 Implementation and Maintenance

3.1 General Information

The PCC Diabetes Management System occupies the BDM namespace. Options, security locks/keys, templates, routines, and globals are namespaced BDM.

3.2 System Requirements

If you are planning on installing and using the GUI DM interface, the following are additional requirements. If you are not planning on using the GUI you may ignore these requirements:

On the RPMS server:

- Kernel v8.0 through patch 1014
- FileMan v22 through patch 2003
- PCC Management Reports (APCL) v3.0 through patch 19
- PCC Data Entry (APCD) v2.0 through patch 9
- Health Summary (APCH) v2.0 through patch 15
- Diabetes Management System (BDM) v2.0 (installation instructions provided above)
- Taxonomy v5.1 through patch 9
- QMan v2.0 through patch 19

On the User (Client) PC:

- Windows XP Service Pack 2 or Higher

3.3 Contents of Distribution for GUI Interface

- bdm20.msi
- bdm20setup.exe

3.4 Requirements for GUI Interface

If you are planning on installing and using the GUI DM interface, the following are additional requirements. If you are *not planning* on using the GUI you may ignore these requirements:

On the RPMS server:

- Kernel v8.0 through patch 1014
- FileMan v22 through patch 1003
- PCC Management Reports (APCL) v3.0 through patch 19
- PCC Data Entry (APCH) v2.0 through patch 9
- Health Summary (APCH) v2.0 through patch 15
- Diabetes Management System (BDM) v2.0 (installation instructions provided above)
- BMX v2.0
- .Net Framework v2.0
- Windows Installer v3.1

On the User (Client) PC:

- Windows XP Service Pack 2 or Higher

3.5 Security Keys

The following is a list of the security keys and their descriptions:

Name	Description
BDMZ REGISTER MAINTENANCE	Lock for the Diabetes Register Maintenance option
BDMZMENU	Lock for main menu of the Diabetes Management System
BDMZ SWITCH OLD DX ENTRIES	Lock for the cleanup of old DX pointers

Figure 3-1: Security keys

4.0 Routines

There are 31 routines, which are detailed in the following table:

Routines	Description
BDMBUL	IHS/CMI/TMJ - Routine to create bulletin
BDMEDTXT	IHS/CMI/TMJ - EDUCATION TEXT ALL EDUCATION
BDMFDIC	IHS/CMI/TMJ - FILEMAN INTERFACE UTILITY
BDMFFS	IHS/CMI/TMJ - DMS FLOW SHEET MANAGEMENT UTILITY
BDMFLOW	IHS/CMI/TMJ - flowsheet bdsm
BDMFMENU	IHS/CMI/TMJ - CONTROL HEADINGS AND MENUS
BDMFTAX3	IHS/CMI/TMJ - DMS TAXONOMY MANAGEMENT UTILITY
BDMFUTIL	IHS/CMI/TMJ - DMS UTILITY PROGRAM
BDMGE	IHS/CMI/TMJ - BDM DMS GUI Filing Routine
BDMGR	IHS/CMI/TMJ - BDM DMS GUI Reports
BDMGT	IHS/CMI/TMJ - BDM DMS GUI Table Lookup
BDMGU	IHS/CMI/TMJ - BDM DMS GUI Utilities
BDMKILL	IHS/CMI/TMJ - KILL ALL BDM VARIABLES
BDMLET	IHS/CMI/TMJ - VIEW PT RECORD LT
BDMLPM	IHS/CMI/TMJ - CALCULATE LAST PAP MAM
BDMPOST	IHS/CMI/TMJ - POST INIT ROUTINE
BDMSDX	IHS/CMI/TMJ - SWITCH CMS DIAGNOSIS LIST ENTRY
BDMSELFM	IHS/CMI/TMJ - print Self Monitoring Pts for dm patients
BDMTRANS	IHS/CMI/TMJ - CONTROL TRANSFER OF PATIENTS TO CMS
BDMVRL	IHS/CMI/TMJ - VIEW PT RECORD LT
BDMVRL2	IHS/CMI/TMJ - DEMO/APPTS ACTION
BDMVRL3	IHS/CMI/TMJ - VIEW PT RECORD CON'T
BDMVRL4	IHS/CMI/TMJ - VIEW PT RECORD CON'T
BDMVRL41	IHS/CMI/TMJ - VIEW PT RECORD CON'T
BDMVRL42	IHS/CMI/TMJ - VIEW PT RECORD CON'T

Routines	Description
BDMVRL43	IHS/CMI/THL - DEMO/APPTS ACTION; [09/28/05 12:39 PM]
BDMVRL5	IHS/CMI/TMJ - VIEW PT RECORD LT
BDMVRL6	IHS/CMI/TMJ - REPORTS INTERFACE
BDMVRL7	IHS/CMI/TMJ - VIEW PT RECORD CON'T
BDMVRL8	IHS/CMI/TMJ - VIEW PT RECORD & DIAGNOSIS DATA
BDMVU	IHS/CMI/TMJ - VIEW RECORD UTILITY CALLS

Figure 4-1: Table of routines

5.0 Callable Routines

There are currently no external entry points in the Diabetes Management System routines.

6.0 Files

The following is a list of files and their descriptions:

File #	Global	File Name	Description
9003201	BDMLET	DMS LETTERS	This file contains follow up letters created by users of the Diabetes Management System. No Data is distributed with this file.
9003201.4	^BDMGUI	DMS GUI REPORT OUTPUT	GUI Report Log File

Figure 6-1: Files table

7.0 Cross-References

The following is a list of cross-references:

Name	Description
'B'	Cross-reference of the NAME field of the DMS LETTERS file.
"AGUI"	Cross-reference of the NAME field of the DMS LETTERS file.
"AUSR"	Cross-reference of the START field of the DMS GUI REPORT OUTPUTS file.
"B"	Cross-reference of the NAME field of the DMS GUI REPORT OUTPUTS file.

Figure 7-1: Cross-references table

8.0 Exported Options

The following is a list of exported options:

No.	Name/Description	Menu Text
1	BDM ADD PTS FROM SEARCH TEMP	Add Patients from Template
2	BDM COMPLICATIONS LIST	Complications List
3	BDM DELETE A PATIENT	Delete Patient from the Register
4	BDM DIABETES AUDIT	Diabetes Audit
5	BDM DIABETIC MEDS LIST	Diabetic Medications List
6	BDM EDIT PCP	Edit Primary Care Provider
7	BDM LETTER MENU	ADD/EDIT DMS Letters
8	BDM MENU	DIABETES MGMT SYSTEM
9	BDM P CASE SUMMARY REPORTS	Register Reports
10	BDM P F/U NEEDED LISTS	Follow-up Needed
11	BDM PATIENT APPOINTMENT LIST	List Patient Appointments
12	BDM PATIENT MANAGEMENT	Patient Management
13	BDM PP MASTER LIST	Master List
14	BDM PP PATIENT GEN RETRIEVAL	Register Patient General Retrieval (Lister)
15	BDM PP PATIENT REPORTS	Patient and Statistical Reports
16	BDM PP PATIENT SUMM, MULTIPLE	Multiple Patient Summaries
17	BDM PP PATIENT SUMMARY, IND	Individual Patient Summary
18	BDM REGISTER MAINTENANCE	Register Maintenance
19	BDM REPORTS	Reports
20	BDM SELF MONITORING REPORT	Blood Glucose Self Monitoring Report
21	BDM SWITCH OLD DX ENTRIES	Switch to new DMS DX names
22	BDM SWITCH REGISTER	Switch to another DIABETES Register
23	BDM TAXONOMY SETUP	Taxonomy Setup Menu
24	BDM USER SETUP	User Setup
25	BDMMENU	Diabetes Management System
26	BDMVMENU	View Patient's Record

Figure 8-1: Exported options table

9.0 Archiving and Purging

There is no archiving and purging in this package.

10.0 External Relations

This package calls the following documented entry points:

Routine	Invoked By
DD^%DT	BDMINIS
C^%DTC	BDMVRL4
NOW^%DTC	BDMINIS, BDMVRL4
%XY^%RCR	BDMFLM, BDMINIT2, BDMINIT3, BDMINIT4, BDMLET
^%ZIS	BDMFMENU, BDMFZIS
HOME^%ZIS	BDMFLM
^%ZISC	BDMFLM, BDMFUTIL, BDMFZIS
\$\$DEL^%ZISH	BDMFLM
\$\$OPEN^%ZISH	BDMFLM
\$\$PWD^%ZISH	BDMFLM
\$\$STATUS^%ZISH	BDMFLM
DF^%ZISH	BDMFLM
ENS^%ZISS	BDMFMENU
KILL^%ZISS	BDMVU
%DT	BDMGU
^%ZTLOAD	BDMFZIS, BDMTRANS
CURRENT^ACMED	BDMVRL3
QONE^ACMED	BDMVRL6
^ACMGTP	BDMVRL6
^ACMLPAT	BDMVRL, BDMVRL3
DQ^ACMPPDT	BDMVRL
SELTYP^ACMPPDTX	BDMVRL
^ACMQK	BDMVRL6
^ACMRL	BDMVRL6
INFORM^ACMRL01	BDMVRL6
ENTRY^ACMSRT	BDMVRL6
DFN^AGFACE	BDMVRL
L5^AGSEENLY	BDMVRL
^AGVAR	BDMVAG1, BDMVRL
EN^AMQQ	opt
GETVISIT^APCDDISP	BDMVRL
^APCDDMUP	opt

Routine	Invoked By
EN1^APCDPL	BDMVRL
^APCD VDSP	BDMVRL
^APCHS	opt
EN^APCHS	BDMVRL
ENREG^APCHS	opt
^APCHSBRW	opt
^APCHSM	opt
TIME^APCLASK	BDMVRL
^APCLD99	BDMVRL3
IF^APCLD99	BDMVRL
TIME^APCLD99	BDMVRL
GO^APCLDM	BDMVRL3
^APCLFS	opt
^APCLTAX0	opt
^ASDREG	BDMVAGL
^AUPNPAT	BDMVRL
WP^DDBR	BDMFDIC
^DDS	BDMFDIC
EN^DDSZ	BDMINIT3
^DIC	BDMFDIC, BDMINIT, BDMINIT2, BDMINIT3, BDMTRANS
IX^DIC	BDMFDIC
MIX^DIC1	BDMFDIC
WAIT^DICD	BDMINIT1
FILE^DICN	BDMFDIC, BDMINIT4, BDMVL
YN^DICN	BDMINIT1, BDMTRANS
DT^DICRW	BDMINIT1
^DIE	BDMFDIC, BDMINIT2, BDMGE
Q^DIFROM0	BDMINIT
\$\$VAL^DIFROMSS	BDMINIT3
OS^DII	BDMINIT3
^DIK	BDMFDIC, BDMFJE, BDMINIT4, BDMLET, BDMVL, BDMGE, BDMGU, BDMGR, BDMGT
IX1^DIK	BDMFDIC, BDMINIT2, BDMINIT3, BDMINIT4, BDMVL
IXALL^DIK	BDMINIT, BDMINIT1
EN^DIKZ	BDMINIT

Routine	Invoked By
EN^DIQ1	BDMFDIC
^DIR	BDMFDIC, BDMINIT, BDMINIT2, BDMVAGL, BDMVRL, BDMVU
I^DITR	BDMINIT1
EN^DIU2	BDMINIT1
EN^VALM	BDMFLM, BDMVAGL, BDMVRL
TERM^VALM0	BDMVRL
CLEAR^VALM1	BDMFLM, BDMFZIS, BDMLET, BDMVAGL, BDMVRL, BDMVRL1, BDMVRL3, BDMVRL4, BDMVRL5
FULL^VALM1	BDMVAGL, BDMVRL
CNTRL^VALM10	BDMFLM
^XBCLS	BDMVU
EN2^XBKD	BDMPREI
GUIR^XBLM	BDMVAGL, BDMVRL
VIEWR^XBLM	BDMFZIS
\$\$FMDIFF^XLFDI	BDMINIS
\$\$FMTE^XLFDI	BDMINIS
\$\$HTFM^XLFDI	BDMINIS
\$\$REPEAT^XLFSTR	BDMVRL1, BDMVU
LOCK^XM	BDMVRL
UNLOCK^XM	BDMVRL
SEND^XMA2	BDMVRL
^XMD	BDMINIS
DISP^XQORM1	BDMFLM, BDMVAGL, BDMVRL

Figure 10-1: External relations table

11.0 Internal Relations

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

12.0 How to Generate Online Documentation

The namespace for this package is BDM. All templates, routines, screen forms, etc. begin with BDM.

This section describes some of the methods by which you can generate Diabetes Management System technical documentation. Online technical documentation pertaining to the Diabetes Management System software, in addition to that which is located in the help prompts, 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 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.

12.1 %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 can discover any deviations from RPMS Programming Standards that exist in the selected routines and see how routines interact with one another (i.e., which routines call or are called by other routines).

To run %INDEX for the Diabetes Management System, specify the BDM namespace at the `Routine(s)?>` prompt.

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

12.2 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 Diabetes Management System options, you must specify the BDM namespace.

12.3 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.

12.4 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

13.0 SAC Requirements/Exemptions

No SAC Exemptions required for BDM 2.0.

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14.0 Glossary

Term	Definition
Archiving	The storing of historical or little-used data offline (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.
DMS	Diabetes Management System
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 (RPMS).
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.

Term	Definition
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	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 part of global arrays.

15.0 Contact Information

If you have any questions or comments regarding this distribution, please contact the OIT Help Desk by:

Phone: (505) 248-4371 or
(888) 830-7280

Fax: (505) 248-4199

Web: <http://www.ihs.gov/GeneralWeb/HelpCenter/Helpdesk/index.cfm>

Email: ITSCHelp@ihs.gov