

Registration Package Refactoring API

Release 1.01

PricewaterhouseCoopers, LLC (PwC) on behalf of
the Department of Veterans Affairs (VA)

Mar 31, 2013

Abstract

As part of the Open Source EHR Refactoring project, we have continued working on refactoring the Registration module code. This document is to describe what we have done in term of code changes for all interested stakeholders.

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1. Introduction

The overarching goal of any code changes we implement is to make the VistA code more modular and readable without altering functionality. *Problem List* was chosen as the first module to be refactored because it has a moderate number of dependencies to other packages, allowing our team to finalize a refactoring strategy and allocate ample time for certification. To date, we have completed a *Problem List* application programming interface (API) and a *Scheduling* API as well.

With the lessons learned from *Problem List* and *Scheduling*, we are now applying these and our refactoring methodology to *Registration*.

With *Registration* we have focused on the roll-and-scroll interface that is being used for admitting, transferring and discharging a patient to/from inpatient care. Most of this core functionality resides under the Bed Control menu option. We have applied the methodology used for *Problem List* and developed an API that is capable of exposing most of the functionality of the Bed Control menu. Similar to the API created for *Problem List*, we have worked to minimize direct global access and the number of assumed variables within the *Registration* API.

2. Code Walkthrough

Several APIs were developed during the refactoring effort. They are described below.

Unless otherwise noted all date formats are internal FileMan format (e.g. 3120121 = Jan 21, 2012). Unless otherwise noted all date formats are internal FileMan format (e.g. 3120121 = Jan 21, 2012). Various utility methods to handle internal date format, including conversions from/to human readable forms, are available in <http://www.va.gov/vdl/application.asp?appid=10> Kernel Developer's Guide and <http://www.va.gov/vdl/application.asp?appid=5> Programmer Manual.

2.1 Clinic management API

\$ADMIT^DGPMAP10 – Admit patient

This extrinsic function creates a new admission.

Format

\$ADMIT^DGPMAP1(.RETURN,.PARAM)

Input Parameters

.RETURN [Required, Boolean] Set to IEN of the new admission if the update succeeded, 0 otherwise

RETURN(0) – [String] Error code^Text^Level (1 for error, 2 for warning, 3 for warning)

PARAM("PATIENT") [Required, Numeric] Patient IEN

PARAM("DATE") [Required, DateTime] Admission date

PARAM("TYPE") [Required, Numeric] Admission type (one of the codes returned by LSTADTYP^DGPMAP17)

PARAM("ADMREG") [Required, Numeric] Admitting regulation (one of the codes returned by LSTADREG^DGPMAP17)

PARAM("ATNDPHY") [Required, Numeric] Attending physician (one of the active providers returned by LSTPROV^DGPMAP17)

PARAM("FDEXC") [Required, Boolean] Set to 1 if patient wants to be excluded from Facility Directory for this admission

PARAM("FTSPEC")	[Required,Numeric] Facility treating specialty (one of the codes returned by LSTFTS^DGPMAP17)
PARAM("SHDIAG")	[Required,String] A brief description of the diagnosis (3-30 chars)
PARAM("WARD")	[Required,Numeric] Ward location (one of the active ward locations returned by LSTWARD^DGPMAP17)
PARAM("ADMSCC")	[Optional,Boolean] Set to 1 if patient is admitted for service connected condition
PARAM("ADMSRC")	[Optional,Numeric] Source of admission (one of the codes returned by LSTADSRC^DGPMAP17)
PARAM("ELIGIB")	[Optional,Numeric] Admitting eligibility
PARAM("PRYMPHY")	[Optional,Numeric] Primary physician (one of the active providers returned by LSTPROV^DGPMAP17)
PARAM("ROOMBED")	[Optional,Numeric] Roombed (one of the active room-bed, assigned to the selected ward location, returned by LSTWBED^DGPMAP17)
PARAM("SCADM")	[Optional,Boolean] Set to 1 if this admission is a result of a previously scheduled admission
PARAM("SERILL")	[Optional,String] Set to "S" if the patient is seriously ill and should be displayed on the Seriously Ill Roster
PARAM("DIAG",#)	[Optional,String] Array of the diagnosis

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

FILELOCK	Record in use. Try again in a few moments.
TIMEUSD	There is already a movement at that date/time entered for this patient.
INVPARAM	Invalid parameter value ...
PATNFND	Patient not found.
ADMPAHAD	Patient already has an active admission.
AREGNFND	Admitting regulation not found.
AREGINAC	Admitting regulation is inactive.
MVTTNFND	Movement type not found.
MVTTINAC	Movement type is inactive.

ADMINVAT	Invalid admission type.
SHDGINV	Invalid diagnosis, must be 3-30 characters long.
WRDNFND	Ward not found.
WRDINVGL	Ward's 'G&L Order' field is not valid.
WRDINACT	Ward is inactive.
BEDNFND	Bed not found.
WRDCNASB	Ward cannot assign this bed.
BEDINACT	Bed is inactive.
BEDOCC	Bed is occupied.
FTSNFND	Facility treating specialty not found.
FTSINAC	Facility treating specialty is inactive.
PROVNFND	Provider not found.
PROVINAC	... is not an active provider.
ASRCNFND	Source of admission not found.

\$\$UPDADM^DGPMAP1() – Update patient admission

This extrinsic function updates an existing admission.

Format

\$\$UPDADM^DGPMAP1(.RETURN,.PARAM,AFN)

Input Parameters

.RETURN	[Required,Boolean] Set to IEN of the new admission if the update succeeded, 0 otherwise
RETURN(0) –	[String] Error code^Text^Level (1 for error, 2 for warning, 3 for warning)
PARAM("DATE")	[Optional, DateTime] Admission date
PARAM("TYPE")	[Optional,Numeric] Admission type (one of the codes returned by LSTADTYP^DGPMAP17)
PARAM("ADMREG")	[Optional,Numeric] Admitting regulation (one of the codes returned by LSTADREG^DGPMAP17)
PARAM("ATNDPHY")	[Optional,Numeric] Attending physician (one of the active providers returned by LSTPROV^DGPMAP17)
PARAM("FDEXC")	[Optional,Boolean] Set to 1 if patient wants to be excluded from Facility Directory for this admission

PARAM("FTSPEC")	[Optional,Numeric] Facility treating specialty (one of the codes returned by LSTFTS^DGPMAP17)
PARAM("SHDIAG")	[Optional,String] A brief description of the diagnosis (3-30 chars)
PARAM("WARD")	[Optional,Numeric] Ward location (one of the active ward locations returned by LSTWARD^DGPMAP17)
PARAM("ADMSCC")	[Optional,Boolean] Set to 1 if patient is admitted for service connected condition
PARAM("ADMSRC")	[Optional,Numeric] Source of admission (one of the codes returned by LSTADSRC^DGPMAP17)
PARAM("ELIGIB")	[Optional,Numeric] Admitting eligibility
PARAM("PRYMPHY")	[Optional,Numeric] Primary physician (one of the active providers returned by LSTPROV^DGPMAP17)
PARAM("ROOMBED")	[Optional,Numeric] Roombed (one of the active room-bed, assigned to the selected ward location, returned by LSTWBED^DGPMAP17)
PARAM("SCADM")	[Optional,Boolean] Set to 1 if this admission is a result of a previously scheduled admission
PARAM("SERILL")	[Optional,String] Set to "S" if the patient is seriously ill and should be displayed on the Seriously Ill Roster
PARAM("DIAG",#)	[Optional,String] Array of the diagnosis
AFN	[Required,Numeric] Admission IEN

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

FILELOCK	Record in use. Try again in a few moments.
INVPARAM	Invalid parameter value ...
ADMNFND	Admission not found.
ADMMBBNM	There is a ... movement on file for this patient on ...
AREGNFND	Admitting regulation not found.
AREGINAC	Admitting regulation is inactive.
MVTTNFND	Movement type not found.
MVTTINAC	Movement type is inactive.

ADMINVAT	Invalid admission type.
SHDGINV	Invalid diagnosis, must be 3-30 characters long.
WRDNFND	Ward not found.
WRDINVGL	Ward's 'G&L Order' field is not valid.
WRDINACT	Ward is inactive.
BEDNFND	Bed not found.
WRDCNASB	Ward cannot assign this bed.
BEDINACT	Bed is inactive.
BEDOCC	Bed is occupied.
FTSNFND	Facility treating specialty not found.
FTSINAC	Facility treating specialty is inactive.
PROVNFND	Provider not found.
PROVINAC	... is not an active provider.
ASRCNFND	Source of admission not found.

\$DELADM^DGPMAP1Q – Delete patient admission

This extrinsic function deletes an existing admission.

Format

\$DELADM^DGPMAP1(.RETURN,AFN)

Input Parameters

.RETURN	[Required,Boolean] Set to 1 if the update succeeded, 0 otherwise
	RETURN(0) – [String] Error code^Text^Level (1 for error, 2 for warning, 3 for warning)
AFN	[Required,Numeric] Admission IEN

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

FILELOCK	Record in use. Try again in a few moments.
INVPARAM	Invalid parameter value ...
ADMNFND	Admission not found.
CANDASIH	Cannot delete before ASIH transfer are removed.

CANMDDF Must delete discharge first.

CANDWPTF Cannot delete while PTF Census record ... is closed.

\$\$TRANSF^DGPMAP12() – Transfer patient

This extrinsic function creates a new transfer and the corresponding movements depending on movement type.

Format

\$\$TRANSF^DGPMAP12(.RETURN,.PARAM)

Input Parameters

.RETURN [Required,Boolean] Set to IEN of the new transfer if the update succeeded, 0 otherwise

RETURN(0) – [String] Error code^Text^Level (1 for error, 2 for warning, 3 for warning)

PARAM("ADMIFN") [Required,Numeric] Admission IEN

PARAM("DATE") [Required, DateTime] Transfer date

PARAM("TYPE") [Required,Numeric] Transfer type (one of the codes returned by LSTTRTYP^DGPMAP17)

Depending on movement type will accept the following parameters:

If movement type is 'INTERWARD TRANSFER':

PARAM("WARD") [Required,Numeric] Ward location (one of the active ward locations returned by LSTWARD^DGPMAP17)

PARAM("ROOMBED") [Optional,Numeric] Roombed (one of the active room-bed, assigned to the selected ward location, returned by LSTWBED^DGPMAP17)

PARAM("FTSPEC") [Optional,Numeric] Facility treating specialty (one of the codes returned by LSTFTS^DGPMAP17)

PARAM("ATNDPHY") [Optional,Numeric] Attending physician (one of the active providers returned by LSTPROV^DGPMAP17)

PARAM("PRYMPHY") [Optional,Numeric] Primary physician (one of the active providers returned by LSTPROV^DGPMAP17)

PARAM("SERILL") [Optional,String] Set to "S" if the patient is seriously ill and should be displayed on the Seriously Ill Roster

PARAM("DIAG",#) [Optional,String] Array of the diagnosis

If movement type is 'TO ASIH':

PARAM("WARD") [Required,Numeric] Ward location (one of the active ward locations returned by LSTWARD^DGPMAP17)

PARAM("ROOMBED")	[Optional,Numeric] Roombed (one of the active room-bed, assigned to the selected ward location, returned by LSTWBED^DGPMAP17)
PARAM("FDEXC")	[Required,Boolean] Set to 1 if patient wants to be excluded from Facility Directory for this admission
PARAM("ADMREG")	[Required,Numeric] Admitting regulation (one of the codes returned by LSTADREG^DGPMAP17)
PARAM("SHDIAG")	[Required,String] A brief description of the diagnosis (3-30 chars)
PARAM("FTSPEC")	[Required,Numeric] Facility treating specialty (one of the codes returned by LSTFTS^DGPMAP17)
PARAM("ATNDPHY")	[Required,Numeric] Attending physician (one of the active providers returned by LSTPROV^DGPMAP17)
PARAM("ADMSCC")	[Optional,Boolean] Set to 1 if patient is admitted for service connected condition
PARAM("ADMSRC")	[Optional,Numeric] Source of admission (one of the codes returned by LSTADSRC^DGPMAP17)
PARAM("PRYMPHY")	[Optional,Numeric] Primary physician (one of the active providers returned by LSTPROV^DGPMAP17)
PARAM("SERILL")	[Optional,String] Set to "S" if the patient is seriously ill and should be displayed on the Seriously Ill Roster
PARAM("DIAG",#)	[Optional,String] Array of the diagnosis
If movement type is 'AUTHORIZED ABSENCE', 'UNAUTHORIZED ABSENCE' or 'AUTH ABSENCE 96 HOURS OR LESS':	
PARAM("RABSDT")	[Optional,Numeric] Absence return date
PARAM("SERILL")	[Optional,String] Set to "S" if the patient is seriously ill and should be displayed on the Seriously Ill Roster
If movement type is 'FROM UNAUTHORIZED ABSENCE', 'FROM AUTHORIZED ABSENCE' or 'FROM AUTH. ABSENCE OF 96 HOURS OR LESS':	
PARAM("ROOMBED")	[Optional,Numeric] Roombed (one of the active room-bed, assigned to the selected ward location, returned by LSTWBED^DGPMAP17)
PARAM("FTSPEC")	[Required,Numeric] Facility treating specialty (one of the codes returned by LSTFTS^DGPMAP17)
PARAM("ATNDPHY")	[Required,Numeric] Attending physician (one of the active providers returned by LSTPROV^DGPMAP17)

PARAM("PRYPHY")	[Optional,Numeric] Primary physician (one of the active providers returned by LSTPROV^DGPMAP17)
PARAM("SERILL")	[Optional,String] Set to "S" if the patient is seriously ill and should be displayed on the Seriously Ill Roster
PARAM("DIAG",#)	[Optional,String] Array of the diagnosis
If movement type is 'FROM AUTHORIZED TO UNAUTHORIZED ABSENCE' or 'FROM UNAUTHORIZED TO AUTHORIZED ABSENCE':	
PARAM("SERILL")	[Optional,String] Set to "S" if the patient is seriously ill and should be displayed on the Seriously Ill Roster
If movement type is 'TO ASIH (OTHER FACILITY)', 'CHANGE ASIH LOCATION (OTHER FACILITY)':	
PARAM("FCTY")	[Required,Numeric] Transfer facility (one of the codes returned by LSTFCTY^DGPMAP17)

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

FILELOCK	Record in use. Try again in a few moments.
INVPARAM	Invalid parameter value ...
TIMEUSD	There is already a movement at that date/time entered for this patient.
TRANBADM	Not before admission movement.
TRANADIS	Not after discharge movement.
MVTTNFND	Movement type not found.
MVTTINAC	Movement type is inactive.
TRAINVAT	Invalid transfer type.
ADMPAHAD	Patient already has an active admission.
AREGNFND	Admitting regulation not found.
AREGINAC	Admitting regulation is inactive.
SHDGINV	Invalid diagnosis, must be 3-30 characters long.
WRDNFND	Ward not found.
WRDINVGL	Ward's 'G&L Order' field is not valid.
WRDINACT	Ward is inactive.

BEDNFND	Bed not found.
BEDINACT	Bed is inactive.
BEDOCC	Bed is occupied.
FTSNFND	Facility treating specialty not found.
FTSINAC	Facility treating specialty is inactive.
PROVNFND	Provider not found.
PROVINAC	... is not an active provider.
ASRCNFND	Source of admission not found.
ASHWINVS	Invalid ward service for this type of movement
TFCNFND	Transfer facility not found.
TFCINAC	Transfer facility is inactive.

\$\$UPDTRA^DGPMAP12() – Update transfer

This extrinsic function updates an existing transfer.

Format

\$\$UPDTRA^DGPMAP12(.RETURN,,PARAM,TFN)

Input Parameters

.RETURN [Required, Boolean] Set to 1 if the update succeeded, 0 otherwise

RETURN(0) – [String] Error code^Text^Level (1 for error, 2 for warning, 3 for warning)

PARAM("DATE")	[Optional, DateTime] Transfer date
PARAM("TYPE")	[Optional, Numeric] Transfer type (one of the codes returned by LSTRTYP^DGPMAP17)
PARAM("WARD")	[Optional, Numeric] Ward location (one of the active ward locations returned by LSTWARD^DGPMAP17)
PARAM("ROOMBED")	[Optional, Numeric] Roombed (one of the active room-bed, assigned to the selected ward location, returned by LSTWBED^DGPMAP17)
PARAM("FTSPEC")	[Optional, Numeric] Facility treating specialty (one of the codes returned by LSTFTS^DGPMAP17)
PARAM("ATNDPHY")	[Optional, Numeric] Attending physician (one of the active providers returned by LSTPROV^DGPMAP17)
PARAM("PRYMPHY")	[Optional, Numeric] Primary physician (one of the active providers returned by LSTPROV^DGPMAP17)

PARAM("SERILL")	[Optional,String] Set to "S" if the patient is seriously ill and should be displayed on the Seriously Ill Roster
PARAM("DIAG",#)	[Optional,String] Array of the diagnosis

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

FILELOCK	Record in use. Try again in a few moments.
INVPARAM	Invalid parameter value ...
TRANFND	Transfer not found.
TRANBADM	Not before admission movement.
TRANADIS	Not after discharge movement.
MVTTNFND	Movement type not found.
MVTTINAC	Movement type is inactive.
TRAINVAT	Invalid transfer type.
WRDNFND	Ward not found.
WRDINVGL	Ward's 'G&L Order' field is not valid.
WRDINACT	Ward is inactive.
BEDNFND	Bed not found.
BEDINACT	Bed is inactive.
BEDOCC	Bed is occupied.
FTSNFND	Facility treating specialty not found.
FTSINAC	Facility treating specialty is inactive.
PROVNFND	Provider not found.
PROVINAC	... is not an active provider.

\$\$DELTRA^DGPMAP12() - Delete transfer

This extrinsic function deletes an existing transfer.

Format

\$\$DELTRA^DGPMAP12(.RETURN,TFN)

Input Parameters

.RETURN [Required,Boolean] Set to 1 if the update succeeded, 0 otherwise

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RETURN(0) – [String] Error code^Text^Level (1 for error, 2 for warning, 3 for warning)

TFN [Required,Numeric] Transfer IEN

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

FILELOCK Record in use. Try again in a few moments.

TRANFND Transfer not found.

DELTMDTA Must delete through corresponding hospital admission

DELTCDDWD Cannot delete while discharge exists

DELTCDDPC Cannot delete when corresponding admission PTF closed out

DELTMMRF ... movement must be removed first

\$\$DISCH^DGPMAP13() – Discharge patient

This extrinsic function creates a new discharge.

Format

\$\$DISCH^DGPMAP13(.RETURN,.PARAM)

Input Parameters

.RETURN [Required,Boolean] Set to IEN of the new discharge if the update succeeded, 0 otherwise

RETURN(0) – [String] Error code^Text^Level (1 for error, 2 for warning, 3 for warning)

PARAM("DATE") [Required, DateTime] Discharge date

PARAM("TYPE") [Required,Numeric] Discharge type (one of the codes returned by LSTDTYP^DGPMAP17)

PARAM("ADMIFN") [Required,Numeric] Admission IEN

If the movement type's field 'ask specialty at movement' is set to 1:

PARAM("FCTY") [Required,Numeric] Transfer facility (one of the codes returned by LSTFCTY^DGPMAP17)

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

FILELOCK Record in use. Try again in a few moments.

INVPARAM Invalid parameter value ...

ADMNFND Admission not found.

TIMEUSD	There is already a movement at that date/time entered for this patient.
DCHPADON	Patient already discharged on...
TRANBADM	Not before admission movement
DCHNBLM	Not before last movement
DSCNMVTD	There is no movement type define for ...
MVTTNFND	Movement type not found.
MVTTINAC	Movement type is inactive.
DISINVAT	Invalid discharge type.

\$\$UPDDSCH^DGPMAP13() – Update discharge

This extrinsic function updates an existing discharge.

Format

\$\$UPDDSCH^DGPMAP13(.RETURN,.PARAM,DMFN)

Input Parameters

.RETURN	[Required,Boolean] Set to 1 if the update succeeded, 0 otherwise
RETURN(0) –	[String] Error code^Text^Level (1 for error, 2 for warning, 3 for warning)
PARAM("DATE")	[Required, DateTime] Discharge date
PARAM("TYPE")	[Required,Numeric] Discharge type (one of the codes returned by LSTDTP^DGPMAP17)
DMFN	[Required,Numeric] Discharge IEN

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

FILELOCK	Record in use. Try again in a few moments.
TIMEUSD	There is already a movement at that date/time entered for this patient.
DCHNFND	Discharge not found.
DCHNBLM	Not before last movement
INVPARAM	Invalid parameter value ...
MVTTNFND	Movement type not found.
MVTTINAC	Movement type is inactive.
DISINVAT	Invalid discharge type.

\$\$DELDSCH^DGPMAP12() - Delete discharge

This extrinsic function deletes an existing discharge.

Format

\$\$DELDSCH^DGPMAP12(.RETURN,DMFN)

Input Parameters

.RETURN [Required,Boolean] Set to 1 if the update succeeded, 0 otherwise

RETURN(0) – [String] Error code^Text^Level (1 for error, 2 for warning, 3 for warning)

DMFN [Required,Numeric] Discharge IEN

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

FILELOCK Record in use. Try again in a few moments.

DCHNFND Discharge not found.

DCHCDWAH You can not delete a WHILE ASIH type discharge

DCHDTCNH Delete through corresponding NHCU/DOM movements

DCHCDOLA Can only delete discharge for last admission

DCHDODLM You can only remove a discharge when it is the last movement for the patient.

DCHMDHDF You must delete the hospital discharge first.

\$\$LSTPROV^DGPMAP17() - List active providers filtered by name

This extrinsic function returns a list of active providers on specified date. The list can be filtered by name.

Format

\$\$LSTPROV^DGPMAP17(.RETURN,SEARCH,START,NUMBER,DGDT)

Input Parameters

.RETURN [Required,Array] Array passed by reference that will receive the data

RETURN(0) – [String] # of entries found^maximum requested^any more?^flags

(consistent with LIST^DIC header node)

RETURN(1,"ID") – [Numeric] Provider IEN

RETURN(2,"NAME") – [String] Provider name

RETURN(3,"INITIAL") – [String] Provider initials

RETURN(4,"TITLE") – [String] Provider title

SEARCH	[Optional,String] Partial match restriction. Default: All entries
START	[Optional,Numeric] The entry from which to begin the list. Default: ""
NUMBER	[Optional,Numeric] Number of entries to return. Default: All entries
DGDT	[Optional, DateTime] if not set returns active providers for today otherwise for specified date

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

None

\$\$LSTADREG^DGPMAP17() - List admitting regulations filtered by name

This extrinsic function returns a list of admitting regulations. The list can be filtered by name.

Format

\$\$LSTADREG^DGPMAP17(.RETURN,SEARCH,START,NUMBER)

Input Parameters

.RETURN	[Required,Array] Array passed by reference that will receive the data
RETURN(0)	– [String] # of entries found^maximum requested^any more?^flags (consistent with LIST^DIC header node)
RETURN(#,"ID")	– [Numeric] Admitting regulation IEN
RETURN(#,"NAME")	– [String] Admitting regulation name
RETURN(#,"CFR")	– [String] Admitting regulation code

SEARCH	[Optional,String] Partial match restriction. Default: All entries
START	[Optional,Numeric] The entry from which to begin the list. Default: ""
NUMBER	[Optional,Numeric] Number of entries to return. Default: All entries

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

None

\$\$LSTFTS^DGPMAP17() - List active facility treating specialties filtered by name

This extrinsic function returns a list of active facility treating specialties. The list can be filtered by name.

Format

\$\$LSTFTS^DGPMAP17(.RETURN,SEARCH,START,NUMBER,DGDT)

Input Parameters

.RETURN	[Required,Array] Array passed by reference that will receive the data
	RETURN(0) – [String] # of entries found^maximum requested^any more?^flags (consistent with LIST^DIC header node)
	RETURN(#,"ID") – [Numeric] Facility treating specialty IEN
	RETURN(#,"NAME") – [String] Facility treating specialty name
	RETURN(#,"SPEC") – [String] Specialty of facility treating specialty
SEARCH	[Optional,String] Partial match restriction. Default: All entries
START	[Optional,Numeric] The entry from which to begin the list. Default: ""
NUMBER	[Optional,Numeric] Number of entries to return. Default: All entries
DGDT	[Optional, DateTime] if not set returns active facility treating specialties for today otherwise for specified date

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

None

\$\$LSTADSRC^DGPMAP17() - List sources of admission filtered by name

This extrinsic function returns a list of sources of admission. The list can be filtered by name.

Format

\$\$LSTADSRC^DGPMAP17(.RETURN,SEARCH,START,NUMBER)

Input Parameters

.RETURN	[Required,Array] Array passed by reference that will receive the data
	RETURN(0) – [String] # of entries found^maximum requested^any more?^flags (consistent with LIST^DIC header node)
	RETURN(#,"ID") – [Numeric] Source of admission IEN
	RETURN(#,"CODE") – [String] Source of admission PTF code
	RETURN(#,"NAME") – [String] Source of admission name
	RETURN(#,"PLACE") – [String] Source of admission place
SEARCH	[Optional,String] Partial match restriction. Default: All entries
START	[Optional,Numeric] The entry from which to begin the list. Default: ""

NUMBER [Optional,Numeric] Number of entries to return. Default: All entries

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

None

\$\$LSTADTYP^DGPMAP17() - List admission types filtered by name

This extrinsic function returns a list of available admission types for a patient. The list can be filtered by name.

Format

\$\$LSTADTYP^DGPMAP17(.RETURN,SEARCH,START,NUMBER,DFN)

Input Parameters

.RETURN [Required,Array] Array passed by reference that will receive the data

RETURN(0) – [String] # of entries found^maximum requested^any more?^flags

(consistent with LIST^DIC header node)

RETURN(1,"ID") – [Numeric] Admission type IEN

RETURN(2,"NAME") – [String] Admission type name

RETURN(3,"TYPE") – [Numeric] Transaction type

RETURN(4,"STATUS") – [Boolean] Admission type status

SEARCH [Optional,String] Partial match restriction. Default: All entries

START [Optional,Numeric] The entry from which to begin the list. Default: ""

NUMBER [Optional,Numeric] Number of entries to return. Default: All entries

DFN [Required,Numeric] Patient IEN

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

INVPARAM Invalid parameter value ...

PATNFND Patient not found.

\$\$STTRTYP^DGPMAP17() - List transfer types filtered by name

This extrinsic function returns a list of available transfer types for a patient at a time. The list can be filtered by name.

Format

\$\$STTRTYP^DGPMAP17(.RETURN,SEARCH,START,NUMBER,DFN,DGDT)

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Input Parameters

.RETURN	[Required,Array] Array passed by reference that will receive the data
	RETURN(0) – [String] # of entries found^maximum requested^any more?^flags (consistent with LIST^DIC header node)
	RETURN(#, "ID") – [Numeric] Admission type IEN
	RETURN(#, "NAME") – [String] Admission type name
	RETURN(#, "TYPE") – [Numeric] Transaction type
	RETURN(#, "STATUS") – [Boolean] Admission type status
SEARCH	[Optional,String] Partial match restriction. Default: All entries
START	[Optional,Numeric] The entry from which to begin the list. Default: ""
NUMBER	[Optional,Numeric] Number of entries to return. Default: All entries
DFN	[Required,Numeric] Patient IEN
DGDT	[Required,DateTime] Transfer date

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

INVPARAM	Invalid parameter value ...
PATNFND	Patient not found.

\$\$LSTDTYP^DGPMAP17() - List discharge types filtered by name

This extrinsic function returns a list of available discharge types for a patient at a time. The list can be filtered by name.

Format

\$\$LSTDTYP^DGPMAP17(.RETURN,SEARCH,START,NUMBER,DFN,DGDT)

Input Parameters

.RETURN	[Required,Array] Array passed by reference that will receive the data
	RETURN(0) – [String] # of entries found^maximum requested^any more?^flags (consistent with LIST^DIC header node)
	RETURN(#, "ID") – [Numeric] Admission type IEN
	RETURN(#, "NAME") – [String] Admission type name
	RETURN(#, "TYPE") – [Numeric] Transaction type

	RETURN(,"STATUS") – [Boolean] Admission type status
SEARCH	[Optional,String] Partial match restriction. Default: All entries
START	[Optional,Numeric] The entry from which to begin the list. Default: ""
NUMBER	[Optional,Numeric] Number of entries to return. Default: All entries
DFN	[Required,Numeric] Patient IEN
DGDT	[Required,DateTime] Discharge date

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

INVPARAM	Invalid parameter value ...
PATNFND	Patient not found.

\$\$LSTFCTY^DGPMAP17() - List transfer facilities filtered by name

This extrinsic function returns a list of transfer facilities. The list can be filtered by name.

Format

\$\$LSTFCTY^DGPMAP17(.RETURN,SEARCH,START,NUMBER)

Input Parameters

.RETURN	[Required,Array] Array passed by reference that will receive the data
	RETURN(0) – [String] # of entries found^maximum requested^any more?^flags (consistent with LIST^DIC header node)
	RETURN(,"ID") – [Numeric] Transfer facility IEN
	RETURN(,"NAME") – [String] Transfer facility name
	RETURN(,"STATE") – [String] Transfer facility state
	RETURN(,"TYPE") – [String] Transfer facility type
SEARCH	[Optional,String] Partial match restriction. Default: All entries
START	[Optional,Numeric] The entry from which to begin the list. Default: ""
NUMBER	[Optional,Numeric] Number of entries to return. Default: All entries

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

None

\$\$LSTWARD^DGPMAP17() - List wards filtered by name

This extrinsic function returns a list of available wards. The list can be filtered by name.

Format

\$\$LSTWARD^DGPMAP17(.RETURN,SEARCH,START,NUMBER)

Input Parameters

.RETURN	[Required,Array] Array passed by reference that will receive the data
	RETURN(0) – [String] # of entries found^maximum requested^any more?^flags (consistent with LIST^DIC header node)
	RETURN(1,"ID") – [Numeric] Ward IEN
	RETURN(2,"NAME") – [String] Ward name
	RETURN(3,"SPEC") – [String] Specialty code^specialty name
	RETURN(4,"SERV") – [String] Service code^service name
SEARCH	[Optional,String] Partial match restriction. Default: All entries
START	[Optional,Numeric] The entry from which to begin the list. Default: ""
NUMBER	[Optional,Numeric] Number of entries to return. Default: All entries

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

None

\$\$LSTWBED^DGPMAP17() - List beds filtered by name

This extrinsic function returns a list of available beds which can be assigned by a ward. The list can be filtered by name.

Format

\$\$LSTWBED^DGPMAP17(.RETURN,SEARCH,START,NUMBER,WARD,DFN)

Input Parameters

.RETURN	[Required,Array] Array passed by reference that will receive the data
	RETURN(0) – [String] # of entries found^maximum requested^any more?^flags (consistent with LIST^DIC header node)
	RETURN(1,"ID") – [Numeric] Ward IEN
	RETURN(2,"NAME") – [String] Ward name
	RETURN(3,"SPEC") – [String] Specialty code^specialty name

	RETURN(,"SERV") – [String] Service code^service name
SEARCH	[Optional,String] Partial match restriction. Default: All entries
START	[Optional,Numeric] The entry from which to begin the list. Default: ""
NUMBER	[Optional,Numeric] Number of entries to return. Default: All entries
WARD	[Required,Numeric] Ward location (one of the active ward locations returned by LSTWARD^DGPMAP17)
DFN	[Optional,Numeric] if is set will return available beds inclusive the bed occupied by this patient

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

INVPARAM	Invalid parameter value ...
PATNFND	Patient not found.
WARDNFND	Ward not found.

\$LSTTPATS^DGPMAP17() - List patients with admissions filtered by name

This extrinsic function returns a list of patients which have at least one admission. The list can be filtered by name.

Format

\$LSTTPATS^DGPMAP17(.RETURN,SEARCH,START,NUMBER)

Input Parameters

.RETURN	[Required,Array] Array passed by reference that will receive the data
	RETURN(0) – [String] # of entries found^maximum requested^any more?^flags (consistent with LIST^DIC header node)
	RETURN(,"ID") – [Numeric] Patient IEN
	RETURN(,"NAME") – [String] Patient name
	RETURN(,"BIRTH") – [String] Patient birth date
	RETURN(,"SSN") – [String] Patient SSN
	RETURN(,"TYPE") – [String] Patient type
	RETURN(,"VETERAN") – [Boolean] Patient veteran status
SEARCH	[Optional,String] Partial match restriction. Default: All entries

START	[Optional,Numeric] The entry from which to begin the list. Default: ""
NUMBER	[Optional,Numeric] Number of entries to return. Default: All entries

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

None

\$\$LSTPADMS^DGPMAP17() - List patient admissions

This extrinsic function returns a list of the patient admissions.

Format

\$\$LSTPADMS^DGPMAP17(.RETURN,DFN)

Input Parameters

.RETURN	[Required,Array] Array passed by reference that will receive the data
	RETURN(0) – [String] # of entries found^maximum requested^any more?^flags (consistent with LIST^DIC header node)
	RETURN(,"ID") – [Numeric] Admission IEN
	RETURN(,"DATE") – [String] Admission date (internal format^external format)
	RETURN(,"TTYPE") – [Numeric] Transaction type
	RETURN(,"PATIENT") – [String] Patient IEN^patient name
	RETURN(,"TYPE") – [String] Admission type IEN^admission type name
	RETURN(,"WARD") – [String] Ward IEN^ward name
	RETURN(,"ROOMBED") – [String] Bed IEN^bed name
	RETURN(,"PRYPHY") – [String] Primary physician IEN^ primary physician name
	RETURN(,"FTSPEC") – [String] Facility treating specialty IEN^name
	RETURN(,"SHDIAG") – [String] Short diagnosis
	RETURN(,"DISCH") – [Numeric] Discharge IEN
	RETURN(,"MASTYPE") – [String] MAS movement type IEN^name
DFN	[Required,Numeric] Patient IEN

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

INVPARAM Invalid parameter value ...

PATNFND Patient not found.

\$\$LSTPTRAN^DGPMAP17() - List patient transfers

This extrinsic function returns a list of the patient transfers related to specified admission.

Format

\$\$LSTPTRAN^DGPMAP17(.RETURN,DFN,AFN)

Input Parameters

.RETURN [Required,Array] Array passed by reference that will receive the data

RETURN(0) – [String] # of entries found^maximum requested^any more?^flags

(consistent with LIST^DIC header node)

RETURN(,"ID") – [Numeric] Transfer IEN

RETURN(,"DATE") – [String] Transfer date (internal format^external format)

RETURN(,"TTYE") – [Numeric] Transaction type

RETURN(,"PATIENT") – [String] Patient IEN^patient name

RETURN(,"TYPE") – [String] Transfer type IEN^ transfer type name

RETURN(,"WARD") – [String] Ward IEN^ward name

RETURN(,"ROOMBED") – [String] Bed IEN^bed name

RETURN(,"PRYPHY") – [String] Primary physician IEN^ primary physician name

RETURN(,"FTSPEC") – [String] Facility treating specialty IEN^name

RETURN(,"SHDIAG") – [String] Short diagnosis

RETURN(,"DISCH") – [Numeric] Discharge IEN

RETURN(,"MASTYPE") – [String] MAS movement type IEN^name

DFN [Required,Numeric] Patient IEN

AFN [Required,Numeric] Admission IEN

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

INVPARAM Invalid parameter value ...

ADMNFND Admission not found.

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PATNFND Patient not found.

\$\$GETLASTM^DGPMAP18() – Get last patient movement details

This extrinsic function returns detailed data of the last patient movement.

Format

\$\$GETLASTM^DGPMAP18(.RETURN,DFN,DGDT)

Input Parameters

.RETURN	[Required,Array] Array passed by reference that will receive the data
RETURN(0)	[String] Error code^Text^Level (1 for error, 2 for warning, 3 for warning)
RETURN("MFN")	[Numeric] Last movement IEN
RETURN("MTYPE")	[String] Last movement type IEN^movement type name
RETURN("TYPE")	[Numeric] Last movement transaction type
RETURN("DATE")	[DateTime] Last movement date
RETURN("MASTYPE")	[Numeric] Last movement MAS type
RETURN("WARD")	[Numeric] Ward IEN
RETURN("ROOMBED")	[Numeric] Bed IEN
RETURN("PRYPHY")	[Numeric] Primary physician IEN
RETURN("FTSPEC")	[Numeric] Facility treating specialty IEN
RETURN("ADMIFN")	[Numeric] Admission IEN
RETURN("ADMDT")	[DateTime] Admission date
RETURN("DISIFN")	[Numeric] Discharge IEN
RETURN("ATNDPHY")	[Numeric] Attending physician IEN
RETURN("FDEXC")	[Boolean] Facility directory exclusion
RETURN("SERILL")	[String] Seriously ill code^name
DFN	[Required,Numeric] Patient IEN
DGDT	[Optional,Numeric] if is set will return last movement related to specified date

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

INVPARAM Invalid parameter value ...

PATNFND Patient not found.

\$\$GETADM^DGPMAP18Q – Get patient admission details

This extrinsic function returns detailed data of the admission.

Format

\$\$GETADM^DGPMAP18(.RETURN,AFN)

Input Parameters

.RETURN [Required,Array] Array passed by reference that will receive the data

RETURN(0) – [String] Error code^Text^Level (1 for error, 2 for warning, 3 for warning)

RETURN("DATE") – [String] Admission date (internal format^external format)

RETURN("TTYPE") – [Numeric] Transaction type code^name

RETURN("PATIENT") – [String] Patient IEN^name

RETURN("TYPE") – [String] Admission type IEN^ name

RETURN("WARD") – [String] Ward IEN^name

RETURN("ROOMBED") – [String] Bed IEN^name

RETURN("SHDIAG") – [String] Short diagnosis

RETURN("ADMSCC") – [String] Admitted for service connected condition code^name

RETURN("ADMREG") – [String] Admitting regulation IEN^name

RETURN("DISCH") – [Numeric] Discharge IEN

RETURN("MASTYPE") – [String] MAS movement type IEN^name

RETURN("FDEXC") – [String] Facility directory exclusion code^name

RETURN("FTSPEC") – [String] Facility treating specialty IEN^name

RETURN("PRYPHY") – [String] Primary physician IEN^name

RETURN("ATNDPHY") – [String] Attending physician IEN^name

RETURN("ADMSRC") – [String] Source of admission IEN^name

RETURN("ELIGIB") – [String] Admitting eligibility IEN^name

RETURN("DIAG",#) – [Array] Diagnosis array

AFN [Required,Numeric] Admission IEN

Output

A Boolean value signaling if the call was successful or not.

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Error Codes Returned

ADMNFND Admission not found.

\$\$GETTRA^DGPMAP18() – Get patient transfer details

This extrinsic function returns detailed data of the transfer.

Format

\$\$GETTRA^DGPMAP18(.RETURN,TFN)

Input Parameters

.RETURN	[Required,Array] Array passed by reference that will receive the data
RETURN(0)	– [String] Error code^Text^Level (1 for error, 2 for warning, 3 for warning)
RETURN("DATE")	– [String] Admission date (internal format^external format)
RETURN("TTYPE")	– [Numeric] Transaction type code^name
RETURN("PATIENT")	– [String] Patient IEN^name
RETURN("TYPE")	– [String] Admission type IEN^ name
RETURN("WARD")	– [String] Ward IEN^name
RETURN("ROOMBED")	– [String] Bed IEN^name
RETURN("RABSDT")	– [Numeric] Return absence date
RETURN("ADMIFN")	– [String] Admission IEN^name
RETURN("FTSPEC")	– [String] Facility treating specialty IEN^name
RETURN("PRYPHY")	– [String] Primary physician IEN^name
RETURN("ATNDPHY")	– [String] Attending physician IEN^name
RETURN("DIAG",#)	– [Array] Diagnosis array
TFN	[Required,Numeric] Transfer IEN

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

TRANFND Transfer not found.

\$\$GETMVT^DGPMAP18() – Get patient movement details

This extrinsic function returns detailed data of the movement.

Format

\$\$GETMVT^DGPMAP18(.RETURN,MFN)

Input Parameters

.RETURN	[Required,Array] Array passed by reference that will receive the data
RETURN(0)	[String] Error code^Text^Level (1 for error, 2 for warning, 3 for warning)
RETURN("DATE")	[String] Admission date (internal format^external format)
RETURN("TTYPE")	[Numeric] Transaction type code^name
RETURN("PATIENT")	[String] Patient IEN^name
RETURN("TYPE")	[String] Admission type IEN^name
RETURN("FCTY")	[String] Transfer facility IEN^name
RETURN("WARD")	[String] Ward IEN^name
RETURN("ROOMBED")	[String] Bed IEN^name
RETURN("PRYPHY")	[String] Primary physician IEN^name
RETURN("FTSPEC")	[String] Facility treating specialty IEN^name
RETURN("SHDIAG")	[String] Short diagnosis
RETURN("ADMIFN")	[String] Admission IEN^name
RETURN("DISCH")	[Numeric] Discharge IEN
RETURN("MASTYPE")	[String] MAS movement type IEN^name
MFN	[Required,Numeric] Movement IEN

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

MVTNFND Movement not found.

\$\$GETMVTT^DGPMAP18() – Get movement type details

This extrinsic function returns detailed data of the movement type.

Format

\$\$GETMVTT^DGPMAP18(.RETURN,IFN)

Input Parameters

.RETURN	[Required,Array] Array passed by reference that will receive the data
RETURN(0)	[String] Error code^Text^Level (1 for error, 2 for warning, 3 for warning)
RETURN("NAME")	[String] Movement type name
RETURN("TTYPE")	[Numeric] Transaction type

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RETURN("MAS") – [Numeric] MAS movement type

RETURN("STAT") – [Boolean] Movement type status

RETURN("ASKSPEC") – [Boolean] Ask specialty at movement

IFN [Required,Numeric] Movement type IEN

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

MVTTNFND Movement type not found.

\$\$GETMASMT^DGPMAP18Q – Get MAS movement type details

This extrinsic function returns detailed data of the MAS movement type.

Format

\$\$GETMASMT^DGPMAP18(.RETURN,IFN)

Input Parameters

.RETURN [Required,Array] Array passed by reference that will receive the data

RETURN(0) – [String] Error code^Text^Level (1 for error, 2 for warning, 3 for warning)

RETURN("NAME") – [String] Movement type name

RETURN("TTYPE") – [Numeric] Transaction type

RETURN("ASKSPEC") – [Boolean] Ask specialty at movement?

RETURN("ASKFTY") – [Boolean] Ask facility at movement?

RETURN("ABS") – [Boolean] Is this movement an absence?

RETURN("CFADM") – [Boolean] Can movement follow admission?

RETURN("ASIH") – [Boolean] ASIH movement?

IFN [Required,Numeric] Movement type IEN

Output

A Boolean value signaling if the call was successful or not.

Error Codes Returned

MVTTNFND Movement type not found.

3. GLOSSARY

IEN Internal Entry Number. The number used to identify an entry within a file. Every record has

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a unique internal entry number. Often abbreviated as IEN.

STOP CODE A three-digit number corresponding to an additional stop/service a patient received in conjunction with a clinic visit.
Stop code entries are used so that medical facilities may receive credit for the services rendered during a patient visit.

4. How to use the code

API

The APIs presented in this paper cover most of the functionality found in the Bed Control menu option. They follow a consistent calling convention that allows for returning rich error messages from the called routines, making them suitable as an interface to be used by external applications.

Assumed Variables

The only assumed variables used in this API are Kernel variables documented in section 2.3.1.3.2 of the SAC. In this version the following assumed variables were used: DUZ,DT,U

Format and conventions of the calls

The conventions used in this API are very similar to those enforced by the RPC Broker. Every tag has at least one parameter, passed by reference that will hold the result of the call. Every function returns a Boolean to signal if the processing was successful or not.

If the return value is 0, the first parameter (RETURN) will be structured as an array containing the errors encountered, numbered from 0 to the error count. The errors have the following form:

ErrorId^Message

Example

INVPARAM^Invalid parameter value – DFN

5. Installation

Along with this paper a KID Host File is provided. The steps required to install the distribution are outlined below:

1. From the *Systems Manager Menu* select *Programmer Options...*
2. Select *Kernel Installation & Distribution System*
3. Select *Installation*
4. Select *Load a Distribution*
5. Enter the host file path, for example C:\ DG_5.3_260005.KID and load the distribution.
6. Use the *Install Package(s)* option and select DG*5.3*260005
7. When prompted *Want KIDS to Rebuild Menu Trees Upon Completion of Install?* Respond NO
8. When prompted *Want KIDS to INHIBIT LOGONs during the install?* Respond NO
9. When prompted *Want to DISABLE Scheduled Options, Menu Options, and Protocols?* Respond NO

6. Conclusions

This paper presented a set of APIs developed as part of the Open Source EHR refactoring effort. They are meant to be used by both scroll & roll interface and RPC tags and to be accessible by other packages and applications. Also they should remove direct global access, uncouple the business logic from the user interface elements and minimize code duplication.