

Scheduling Package Refactoring API

Release 1.04

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

April 11, 2013

Abstract

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

Contents

1	Introduction	1
2	Code Walkthrough	3
3	Glossary	37
4	How to use the code	38
5	Installation	39
6	Conclusions	39

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) that is used both by the roll-and-scroll interface and CPRS.

With the lessons learned from *Problem List*, we are now applying these and our refactoring methodology to *Scheduling*. This module has a significant number of dependencies to other VistA packages, and thus requires an increased concentration to the interactions it has within the system and how we will develop

an API. Our team has prepared a dependency document [*RGI_Open Source EHR Refactoring Services_Scheduling Dependency Notes.docx*] outlining these interactions and it is available on our project page on the OSEHRA website [<http://www.osehra.org/group/ehr-refactoring-services>]. We have specifically chosen this module in order to align with VA's active search into improving scheduling functionality within Vista; any refactoring completed by our project team should be helpful to future *Scheduling* design and implementation efforts.

Scheduling has a well-defined API for the core information that is being used by its dependent packages; details on this API may be found in the PIMS Technical Manual [<http://www.va.gov/vdl/documents/Clinical/Scheduling/pimstm.pdf>]. However, this API is read-only, meaning it provides the ability to view currently scheduled appointments but is not being used by the roll-and-scroll interface. Currently there appears to be no API for the core *Scheduling* functionality of making appointments, check-ins and check-outs, etc.

There is an additional API that is being used by the Primary Care Management module, *Managed Care*. This module does not deal directly with the core *Scheduling* functionality, and thus its interactions with the module can be considered unique and separate; it has a graphical user interface (GUI) and gets/sets its associated data through RPC tags within the *Scheduling* module.

Additionally, we found that there are a number of packages that currently use globals belonging to *Scheduling* directly. Details on these packages can be found in the dependency notes document. (Within the roll-and-scroll interface, routines using globals directly is considered the norm, not the exception.)

Since there is a well-defined API for reading *Scheduling* data, we have focused on the roll-and-scroll interface that is being used for making, changing, or editing appointments. Most of this core functionality resides under the Appointment Management 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 Appointment Management 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 *Scheduling* API.

2. Code Walkthrough

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

In addition to the Scheduling package routines, two new routines are added to the Registration package (DGSAAPI and DGSADAL). They return specific vocabulary entries from the Registration package.

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 Fileman <http://www.va.gov/vdl/application.asp?appid=5> Programmer Manual.

2.1 Clinic management API

\$\$GETCLN^SDMAPI1() - Return Clinic details

This extrinsic function returns detailed information on a clinic.

Format

\$\$GETCLN^SDMAPI1(.RETURN,SC)

Input Parameters

.RETURN	[Required,Array] Array passed by reference that will receive the data. All fields are returned as internal_format^external_format. Fields returned:
RETURN ("ABBREVIATION")	[String] Abbreviation
RETURN ("ADMINISTER INPATIENT MEDS?")	[String] If the clinic location is authorized to dispense inpatient medications to outpatients this field will be set to 1^YES
RETURN ("AGENCY")	[Numeric] Agency associated with specific location (pointer to file 4.11)
RETURN ("ALLOWABLE CONSECUTIVE NO-SHOWS")	[Numeric] Number of times in a row that a patient can be a no-show in a clinic before he/she is flagged for possible discharge from the clinic.
RETURN ("APPT. CANCELLATION LETTER")	[Numeric] Appointment cancellation letter associated with this clinic (pointer to file 407.5)
RETURN ("ASK DIAGNOSIS AT CHECK OUT")	[Numeric] 0=no, 1=yes/required, 2=yes/not required
RETURN ("ASK FOR CHECK IN/OUT TIME")	[Boolean] 0=no, 1=yes
RETURN ("ASK PROVIDER AT CHECK OUT")	[Numeric] 0=no, 1=yes/required,

Latest version available at the [OSEHRA Journal](http://hdl.handle.net/10909/2) [<http://hdl.handle.net/10909/2>]

Distributed under [Creative Commons Attribution License](#)

	2=yes/not required
RETURN ("ASK STOP CODES AT CHECK OUT")	[Boolean] 0=no, 1=yes
RETURN ("AUTOFINISH CLINIC PRINTER")	[Numeric] Printer where autofinished Rx's for this clinic will be printed (pointer to file 3.5)
RETURN ("AUTOFINISH RX SITE")	[Numeric] Outpatient site this location is associated with (pointer to file 59)
RETURN ("AVAILABILITY FLAG")	[DateTime] Date/time set up for clinic availability
RETURN ("CATEGORY OF VISIT")	[String] Category of visit associated with a specific location
RETURN ("CLINIC CANCELLATION LETTER")	[Numeric] Clinic cancellation letter associated with this clinic (pointer to file 407.5)
RETURN ("CLINIC GROUP (REPORTS)")	[Numeric] Pointer to file 409.67
RETURN ("CLINIC MEETS AT THIS FACILITY?")	[String] N=NO, Y=YES
RETURN ("CLINIC SERVICES RESOURCE")	[Numeric] Pointer to file 403.12
RETURN ("COLLATERAL VISITS? (Y OR N)")	[String] Are collateral visits allowed to this clinic (N=NO, Y=YES)
RETURN ("COPIES")	[Numeric] How many copies of appointment lists should be generated for this clinic
RETURN ("CREDIT STOP CODE")	[Numeric] Appointments to this clinic will receive this stop code credit in addition to the 'normal' stop code credit (pointer to file 40.7)
RETURN ("DEFAULT APPOINTMENT TYPE")	[Numeric] Pointer to APPOINTMENT TYPE file (file 409.1)
RETURN ("DEFAULT PROVIDER")	[Numeric] Default provider or physician that is assigned to specific clinic (pointer to file 200)
RETURN ("DEFAULT TO PC PRACTITIONER?")	[Boolean] If there is no default provider but there is a current primary care practitioner for the patient - it will be provided as the default provider

RETURN ("DISPLAY INCREMENTS PER HOUR")	[Numeric] 1:60-MIN, 2:30-MIN, 4:15-MIN, 3:20-MIN, 6:10-MIN
RETURN ("DISPOSITION ACTION")	[Numeric] Disposition action associated with specific location (0=none, 1=appointment record request, 2=scheduling)
RETURN ("DIVISION")	[Numeric] Pointer to file 40.8
RETURN ("HOLD SC SLOTS UNTIL # OF DAYS")	[Numeric] Should service connected slots be held open for a set number of days?
RETURN ("HOUR CLINIC DISPLAY BEGINS")	[Numeric] Hour part only
RETURN ("INACTIVATE DATE")	[DateTime] Date clinic was inactivated
RETURN ("INCLUDE ON FILE ROOM LISTS?")	[Boolean]
RETURN ("INSTITUTION")	[Numeric] Pointer to file 4
RETURN ("LENGTH OF APP'T")	[Numeric] Length of appointment in minutes
RETURN ("MAX # DAYS FOR AUTO-REBOOK")	[Numeric]
RETURN ("MAX # DAYS FOR FUTURE BOOKING")	[Numeric]
RETURN ("MODULE")	[Numeric] Module or name of hospital location (pointer to file 44)
RETURN ("NAME")	[String] Name
RETURN ("NO SHOW LETTER")	[Numeric] No-show letter associated with this clinic (pointer to file 407.5)
RETURN ("NON-COUNT CLINIC? (Y OR N)")	[String] Y=YES, N=NO
RETURN ("OCCASION OF SERVICE CLINIC?")	[Boolean]
RETURN ("OOS CALLING PACKAGE")	[Numeric] The package which created the occasion of service location (pointer to file 9.4)
RETURN ("OVERBOOKS/DAY MAXIMUM")	[Numeric]
RETURN ("PHYSICAL LOCATION")	[String] Physical location of this specific clinic
RETURN ("PRE-APPOINTMENT LETTER")	[Numeric] Pre-appointment letter

	associated with this clinic (pointer to file 407.5)
RETURN ("PRINCIPAL CLINIC")	[Numeric] Principal clinic or main clinic assigned to this specific location (pointer to file 44)
RETURN("PRIVILEGED USER",IEN)	[Array,Numeric] List of users that have the right to make appointments.
RETURN ("PROHIBIT ACCESS TO CLINIC?")	[String] If only privileged users have access to book to this clinic this field will be set to Y^YES
RETURN ("PRV. YEAR CREDIT STOP CODE")	[Numeric] Previous year's credit stop code assigned to clinic (pointer to file 40.7)
RETURN ("PRV. YEAR STOP CODE")	[Numeric] Previous year's three digit stop code number that was assigned to specific location (pointer to file 40.7)
RETURN ("REACTIVATE DATE")	[DateTime] Date clinic was reactivated
RETURN ("REQUIRE ACTION PROFILES?")	[Boolean] 0=YES, 1=NO
RETURN ("REQUIRE X-RAY FILMS?")	[String] If x-ray films are required for patients scheduled in this clinic this field will be set to Y^YES
RETURN ("SCHEDULE ON HOLIDAYS?")	[String] If the user is able to schedule appointments on holiday's for specific location this field will be set to Y^YES
RETURN ("SERVICE")	[String] Service assigned to this specific location (M:MEDICINE, S:SURGERY, P:PSYCHIATRY, R:REHAB MEDICINE, N:NEUROLOGY, 0:NONE)
RETURN ("SPECIAL AMIS STOP")	[Numeric] Special AMIS stop associated with a specific location based on the Service assigned (10:MENTAL HYGEINE, 11:DAY TREATMENT, 12:DAY HOSPITAL, 13:DRUG DEPENDANCE, 14:ALCOHOL TREATMENT, 15:EMERGENCY UNIT, 16:EMPLOYEE HEALTH)
RETURN ("START TIME FOR AUTO REBOOK")	[Numeric] Start time (hour of day) that should be searched for when user auto rebooking an appointment

RETURN ("STOP CODE NUMBER")	[Numeric] Three digit stop code number assigned to specific location (pointer to file 40.7)
RETURN ("TELEPHONE")	[String] Telephone number for this specific location
RETURN ("TREATING SPECIALTY")	[Numeric] Treating specialty assigned to this specific location (pointer to file 45.7)
RETURN ("TYPE")	[String] Type of clinic (one of the codes returned by LSTHLTP^SDMAPI1)
RETURN ("TYPE EXTENSION")	[Numeric] Pointer to file 40.9
RETURN ("VARIABLE APP'NTMENT LENGTH")	[String] V=Yes, variable length
RETURN ("VISIT LOCATION")	[String] Location of visit
RETURN ("WARD LOCATION FILE POINTER")	[Numeric] If location is a ward, this is the file pointer to the Ward Location File (file 42)
RETURN ("WORKLOAD VALIDATION AT CHK OUT")	[Boolean] 1 will result in a validation being performed on each checked out encounter for this clinic
SC	[Required,Numeric] Clinic IEN (pointer to File 44)

Output

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

Error Codes Returned

INVPARAM Invalid parameter.

CLNNFND Clinic not found.

\$LSTCLNS^SDMAPI1() - Return clinics filtered by name

This extrinsic function returns a list of clinics filtered by name.

Format

\$LSTCLNS^SDMAPI1(.RETURN,SEARCH,.START,NUMBER)

Input Parameters

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

RETURN [Boolean] 1=success, 0=failure

RETURN(#,"ID") [Numeric] Clinic IEN

RETURN(#,"NAME") [String] Clinic name

Latest version available at the [OSEHRA Journal](http://hdl.handle.net/10909/2) [<http://hdl.handle.net/10909/2>]

Distributed under [Creative Commons Attribution License](#)

SEARCH	[Optional,String] Partial match restriction. Default: All entries
.START	[Optional,String] The clinic name from which to begin the list.
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

\$\$SLOTS^SDMAPI1() – Get available slots

This extrinsic function returns the available slots for a clinic.

Format

\$\$SLOTS^SDMAPI1(.RETURN,SC)

Input Parameters

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

RETURN [Boolean] 1=success,0=failure

RETURN(0) [Numeric] Hour, clinic display begins (this is the starting point of each line in the availability pattern)

RETURN(0,1) [String] Availability string

SC [Required,Numeric] Clinic IEN (pointer to File 44)

Output

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

Error Codes Returned

INVPARAM Invalid parameter

CLNNFND Clinic not found.

\$\$FRSTAVBL^SDMAPI1() - Find first available appointment date

This extrinsic function finds the first available appointment date for a clinic.

Format

\$\$FRSTAVBL^SDMAPI1(.RETURN,SC)

Input Parameters

.RETURN [Required,DateTime] Passed by reference, set to the first available date.

SC [Required,Numeric] Clinic IEN (pointer to File 44)

Output

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

Error Codes Returned

INVPARAM	Invalid parameter
CLNNFND	Clinic not found.

\$\$GETAPTS^SDMAPI1() - Get patient appointments

This extrinsic function returns a list of patient appointments.

Format

\$\$GETAPTS^SDMAPI1(.RETURN,DFN,SD)

Input Parameters

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

RETURN("APT",DT," APPOINTMENT DATE/TIME") [DateTime] Date of appointment

RETURN("APT",DT," APPOINTMENT TYPE") [Numeric] Type of appointment
(pointer file 409.1)

RETURN("APT",DT," APPOINTMENT TYPE SUB-CATEGORY") [Numeric] Sub-category associated
with this appointment (pointer to file 35.2)

RETURN("APT",DT," APPT. CANCELLED") [Numeric] Clinic in which the patient had a
scheduled appointment which was cancelled to set
this appointment

RETURN("APT",DT," AUTO-REBOOKED APPT. DATE/TIME") [DateTime] The date/time for which
this appointment was rescheduled

RETURN("APT",DT," CANCELLATION REASON") [Numeric] Cancellation reason (pointer to file
409.2)

RETURN("APT",DT," CANCELLATION REMARKS") [String] Cancellation remarks

RETURN("APT",DT,"CLINIC") [Numeric] Clinic (pointer to file 44)

RETURN("APT",DT," COLLATERAL VISIT") [String] Collateral visit (1=YES, empty=NO)

RETURN("APT",DT," CURRENT STATUS") [String] Current status of appointment (one of:
FUTURE, NO ACTION TAKEN, CHECKED IN,
CHECKED OUT, NON-COUNT)

RETURN("APT",DT," DATA ENTRY CLERK") [Numeric] User who made appointment

RETURN("APT",DT," DATE APPT. MADE") [DateTime] The date the appointment was
entered into the scheduling system

RETURN("APT",DT," DESIRED DATE OF APPOINTMENT") [DateTime]

RETURN("APT",DT," EKG DATE/TIME") [DateTime] The date/time the patient should

report for EKG tests

RETURN("APT",DT," ENCOUNTER CONVERSION STATUS")	[Numeric] 0=NOT CONVERTED, 1=CONVERTED
RETURN("APT",DT," ENCOUNTER FORMS AS ADD-ONS")	[Boolean] Used by the Print Manager to indicate that it has printed the encounter forms as an add-on.
RETURN("APT",DT," ENCOUNTER FORMS PRINTED")	[Boolean] Used by the Print Manager to indicate that it has printed the encounter forms.
RETURN("APT",DT," FOLLOW-UP VISIT")	[Boolean]
RETURN("APT",DT," LAB DATE/TIME")	[DateTime] The date/time the patient should report for LAB tests
RETURN("APT",DT," NEXT AVA. APPT. INDICATOR")	[Numeric] One of: 0:NOT INDICATED TO BE A 'NEXT AVA.' APPT., 1:'NEXT AVA.' APPT. INDICATED BY USER, 2:'NEXT AVA.' APPT. INDICATED BY CALCULATION, 3:'NEXT AVA.' APPT. INDICATED BY USER & CALCULATION
RETURN("APT",DT," NO-SHOW/CANCEL DATE/TIME")	[DateTime] The date/time the no-show was cancelled.
RETURN("APT",DT," NO-SHOW/CANCELLED BY")	[Numeric] The user who cancelled the no-show (pointer to file 200)
RETURN("APT",DT," NUMBER OF COLLATERAL SEEN")	[Numeric] The number assigned to the collateral.
RETURN("APT",DT," OUTPATIENT ENCOUNTER")	[Numeric] Outpatient encounter created rom this appointment (pointer to file 409.68)
RETURN("APT",DT," PURPOSE OF VISIT")	[Numeric] One of: 1=C&P, 2=10-10, 3=SCHEDULED VISIT, 4=UNSCHED. VISIT
RETURN("APT",DT," REAL APPOINTMENT")	[Boolean] This is a computed field which determines whether the appointment is considered real (kept)
RETURN("APT",DT," ROUTING SLIP PRINT DATE")	[DateTime] Date when routing slip was printed.
RETURN("APT",DT," ROUTING SLIP PRINTED")	[String] If a routing sheet was printed for this appointment, this field will be set to Y^YES.
RETURN("APT",DT," SCHEDULING REQUEST TYPE")	[String] One of: N='NEXT AVAILABLE' APPT., C=OTHER THAN 'NEXT AVA.' (CLINICIAN REQ.), P=OTHER THAN 'NEXT AVA.' (PATIENT REQ.),

W=WALKIN APPT., M=MULTIPLE APPT. BOOKING,
A=AUTO REBOOK, O=OTHER THAN 'NEXT AVA.'
APPT.

RETURN("APT",DT," SPECIAL SURVEY DISPOSITION") [Numeric] If this patient is claiming exposure to agent orange or ionizing radiation, this field contains the special survey disposition.

RETURN("APT",DT," STATUS") [String] Appointment status. One of: N=NO-SHOW, C=CANCELLED BY CLINIC, NA=NO-SHOW & AUTO RE-BOOK, CA=CANCELLED BY CLINIC & AUTO RE-BOOK, I=INPATIENT APPOINTMENT, PC=CANCELLED BY PATIENT, PCA=CANCELLED BY PATIENT & AUTO-REBOOK, NT=NO ACTION TAKEN

RETURN("APT",DT," TELEPHONE OF CLINIC") [String] The telephone number for the clinic at which this patient has an appointment.

RETURN("APT",DT," X-RAY DATE/TIME") [DateTime] The date/time the patient should report for X-RAY tests

DFN [Required,Numeric] Patient IEN (pointer to File 2)

SD [Optional,DateTime] – if not set returns all patient appointments.

- If SD is set to a valid date-time returns the corresponding appointment.
- If SD(0) is set (0/1) returns patient appointments before/after specified date (SD).

Output

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

Error Codes Returned

INVPARAM Invalid parameter value

PATNFND Patient not found.

\$\$HASPEND^SDMAPI1() – Check if patient has pending appointments

This extrinsic function verifies if a patient has pending appointments.

Format

\$\$HASPEND^SDMAPI1(.RETURN,DFN)

Input Parameters

.RETURN [Required,Boolean] Set to 1 if the patient has pending appointments, 0 otherwise

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.

\$\$GETPEND^SDMAPI1() - Return patient pending appointments

This extrinsic function returns a list of patient pending appointments.

Format

\$\$GETPEND^SDMAPI1(.RETURN,DFN)

Input Parameters

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

RETURN [Numeric] Number of entries returned

RETURN(APPTDT," APPOINTMENT TYPE") – [Numeric] Type of appointment

RETURN(APPTDT," CLINIC") – [Numeric] Clinic

RETURN(APPTDT," COLLATERAL VISIT") – [Boolean] Collateral visit

RETURN(APPTDT," CONSULT LINK") – [Numeric]

RETURN(APPTDT," EKG DATE/TIME") – [DateTime]

RETURN(APPTDT," LAB DATE/TIME") – [DateTime]

RETURN(APPTDT," LENGTH OF APP'T") – [Numeric] Length of appointment

RETURN(APPTDT," X-RAY DATE/TIME") – [DateTime]

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.

2.2 Appointment management API

\$\$MAKE^SDMAPI2() - Make appointment

This extrinsic function creates a new appointment.

Format

\$\$MAKE^SDMAPI2(.RETURN,DFN,SC,SD,TYPE,STYP,LEN,SRT,OTHR,CIO,LAB,XRAY,EKG,RQXRAY,CONS,LVL)

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)
DFN	[Required,Numeric] Patient IEN
SC	[Required,Numeric] Clinic IEN
SD	[Required,DateTime] Appointment date/time
TYPE	[Required,Numeric] Purpose of visit (drawn from the Appointment Types list – see \$\$LSTAPPT^SDMAPI1)
STYP	[Optional,Numeric] Sub-category associated with this appointment (one of the codes returned by LSTSBCTG^DGSAPI)
LEN	[Required,Numeric] Appointment length in minutes.
SRT	[Required,String] Scheduling request type (one of the codes returned by LSTSRT^SDMAPI1)
OTHR	[Optional,String] Any other tests ordered in association with the appointment
CIO	[Optional,String] If set to “CI” the appointment will be checked-in.
LAB	[Optional,DateTime] If this patient is scheduled for laboratory tests in conjunction with this appointment, set LAB to the date/time the patient should report.
XRAY	[Optional,DateTime] If this patient is scheduled for x-ray in conjunction with this appointment, set XRAY to the date/time the patient should report.
EKG	[Optional,DateTime] If this patient is scheduled for EKG in conjunction with this appointment, set EKG to the date/time the patient should.
RQXRAY	[Optional,Boolean] Set to 1 if x-ray films are required for this appointment.
CONS	[Optional,Numeric] Consult associated with this appointment (pointer to Request/Consultation file).
LVL	[Optional,Numeric] <ul style="list-style-type: none"> - Forces appointment creation if it is set to 1 (ignores all warnings described below) - If set to 2 will return an error if there are no open slots - If set to anything higher than 2 or left undefined, will return an error if the patient has an active appointment on same time, or on same day, or a canceled appointment on same time, or if there are no open slots.

Output

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

Error Codes Returned

APTCINV	Clinic is scheduled to be inactivated on ...
APTCBCP	CAN'T BOOK WITHIN A CANCELLED TIME PERIOD
APTCLUV	There is no available slot for this date/time.
APTEXCD	EXCEEDS MAXIMUM DAYS FOR FUTURE APPOINTMENT!!
APTEXOB	WILL EXCEED MAXIMUM ALLOWABLE OVERBOOKS,
APTNOST	NO OPEN SLOTS THEN
APTOAPD	ONLY ... OVERBOOKS PER DAY!!
APTOVBK	OVERBOOK!
APTOVOS	THAT TIME IS NOT WITHIN SCHEDULED PERIOD!
APTOAPD	ONLY ... OVERBOOK PER DAY!!
APTPAHA	PATIENT ALREADY HAS APPOINTMENT ... THEN.
APTPAHCO	PATIENT ALREADY HAS APPOINTMENT ... THEN.
APTPAHU	Patient already has an appt on ...
APTPCLA	Appointment date is prior to the clinic's availability date.
APTPHSD	PATIENT ALREADY HAS APPOINTMENT ON THE SAME DAY ...
APTPPAB	Appointment date is prior to the patient's date of birth.
APTPPCP	THIS TIME WAS PREVIOUSLY CANCELLED BY THE PATIENT ...
APTSHOL	HOLIDAY??
APTNOST	NO OPEN SLOTS THEN
APTWHEN	WHEN??
CLNNFND	Clinic not found.
CLNURGT	Access to ... is prohibited! Only users with a special code may access this clinic.
INVPARAM	Invalid parameter value
PATDIED	PATIENT HAS DIED.
PATNFND	Patient not found.
STYPNFND	Appointment subtype not found or inactive.

TYPINVD Patient must have the eligibility code EMPLOYEE, COLLATERAL or SHARING AGREEMENT to

Latest version available at the [OSEHRA Journal](http://hdl.handle.net/10909/2) [<http://hdl.handle.net/10909/2>]

Distributed under [Creative Commons Attribution License](#)

choose those types of appointments.

TYPINVSC The 'SC Percent', 'Service Connected' and 'Primary Eligibility Codes' are OUT OF SYNC, Please CORRECT the problem.

TYPNFND Appointment type not found.

\$\$MAKEUS^SDMAPI2() – Make unscheduled appointment

This extrinsic function creates a new unscheduled appointment.

Format

\$\$MAKEUS^SDMAPI2(.RETURN,DFN,SC,SD,TYP,STYP,CIO)

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)
DFN	[Required,Numeric] Patient IEN (pointer to File 2)
SC	[Required,Numeric] Clinic IEN (pointer to File 44)
SD	[Optional,DateTime] Appointment date/time. Defaults to now.
TYP	[Required,Numeric] Purpose of visit visit (drawn from the Appointment Types list – see \$\$LSTAPPT^SDMAPI1)
STYP	[Optional,Numeric] Sub-category associated with this appointment (one of the codes returned by LSTSBCTG^DGSAPI)
CIO	[Optional,String] 'CI'=check-in appointment, 'CO'=check-out appointment

Output

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

Error Codes Returned

APTCINV	Clinic is scheduled to be inactivated on ...
APTCIPE	You cannot check in this appointment.
APTCITS	It is too soon to check in this appointment.
APTCOCE	>>> You can not check out this appointment.
APTCOTS	It is too soon to check out this appointment.
APTCOCN	You cannot check out this appointment.
APTCOAC	Appointment already checked out
APTCONW	Appointment new encounter

APTLOCK	Another user is editing this record. Trying again.
APTPAHU	Patient already has an appt on ...
CLNINV	Invalid Clinic.
CLNSCIN	Invalid Clinic Stop Code ...
CLNSCNR	Clinic's Stop Code ... has no restriction type ...
CLNSCPS	Clinic's Stop Code ... cannot be ...
CLNSCRD	Clinic's Stop Code ... cannot be used. Restriction date is ...
CLNNFND	Clinic not found.
INVPARAM	Invalid parameter value
PATDIED	PATIENT HAS DIED.
PATNFND	Patient not found.
STYPNFND	Appointment subtype not found or inactive.
TYPINVD	Patient must have the eligibility code EMPLOYEE, COLLATERAL or SHARING AGREEMENT to choose those types of appointments.
TYPINVSC	The 'SC Percent', 'Service Connected' and 'Primary Eligibility Codes' are OUT OF SYNC, Please CORRECT the problem.
TYPNFND	Appointment type not found.

\$CANCELSDMI2() - Cancel appointment

This extrinsic function cancels an existing appointment.

Format

`$CANCELSDMI2(.RETURN,DFN,SC,SD,TYP,RSN,RMK)`

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)
DFN	[Required,Numeric] Patient IEN
SC	[Required,Numeric] Clinic IEN
SD	[Required,DateTime] Appointment date
TYP	[Required,String] Status (one of the codes returned by LSTAPPST^SDMI1)
RSN	[Required,Numeric] Cancellation reason (one of the codes returned by LSTCRSNS^SDMI1)

Latest version available at the [OSEHRA Journal](http://hdl.handle.net/10909/2) [<http://hdl.handle.net/10909/2>]

Distributed under [Creative Commons Attribution License](#)

RMK [Optional,String] Remarks

Output

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

Error Codes Returned

APTCAND	Appointment already cancelled
APTCCHO	Appointment has a check out date and cannot be cancelled.
APTCRGT	Appt. ... NOT CANCELLED. Access to this clinic is restricted to only privileged users!
APTCNPE	You cannot cancel this appointment.
CLNNFND	Clinic not found.
INVPARAM	Invalid parameter value
PATNFND	Patient not found.
RSNNFND	Cancellation reason not found.

\$NOSHOW^SDMAPI2() - Mark appointment as no-show

This extrinsic function marks an existing appointment as no-show.

Format

\$NOSHOW^SDMAPI2(.RETURN,DFN,SC,SD,LVL)

Input Parameters

.RETURN	[Required,Boolean] Set to 1 if the update succeeded, 0 otherwise
DFN	[Required,Numeric] Patient IEN (pointer to File 2)
SC	[Required,Numeric] Clinic IEN (pointer to File 44)
SD	[Required,DateTime] Appointment date/time
LVL	[Optional,Numeric] <ul style="list-style-type: none"> - If set to 1, unconditionally marks the appointment as no show - If set to anything else than 1 or left undefined will return an error if any of the checks failed (for instance if the appointment was already marked as no show).

Output

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

Error Codes Returned

APTNSAL	ALREADY RECORDED AS NO-SHOW... WANT TO ERASE
APTNSAR	THIS APPOINTMENT ALREADY A NO-SHOW AND REBOOKED... ARE YOU SURE YOU WANT TO ERASE

APTNSCE	You cannot execute no-show processing for this appointment.
APTNSIA	Inpatient Appointments cannot reflect No-Show status!
CLNNFND	Clinic not found.
INVPARAM	Invalid parameter value
PATNFND	Patient not found.

\$\$CHECKIN^SDMAPI2() - Check in appointment

This extrinsic function checks in an existing appointment.

Format

\$\$CHECKIN^SDMAPI2(.RETURN,DFN,SD,SC,CIDT)

Input Parameters

.RETURN	[Required,Boolean] Set to 1 if the check in succeeded, 0 otherwise RETURN(0) – [String] Error code^Text^Level (1 for error, 2 for warning, 3 for warning)
DFN	[Required,Numeric] Patient IEN (pointer to File 2)
SD	[Required,DateTime] Appointment date/time
SC	[Required,Numeric] Clinic IEN (pointer to File 44)
CIDT	[Optional,DateTime] Date and time the patient was checked in for the appointment

Output

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

Error Codes Returned

APTCIPE	You cannot check in this appointment.
APTCITS	It is too soon to check in this appointment.
CLNNFND	Clinic not found.
INVPARAM	Invalid parameter value
PATNFND	Patient not found.

\$\$CHECKO^SDMAPI4() - Check out appointment

This extrinsic function checks out an existing appointment.

Format

\$\$CHECKO^SDMAPI2(.RETURN,DFN,SD,SC)

Input Parameters

.RETURN	[Required,Boolean] Set to 1 if the check-in succeeded, 0 otherwise
---------	--

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

RETURN("COD") – [DateTime] Checked out date/time

RETURN("COVISIT") – [Boolean] Collateral visit (1=this patient has been seen as a collateral for another patient)

RETURN("LOCATION") – [Numeric] Encounter location (pointer to file 44)

RETURN("SDOE") – [Numeric] Pointer to the corresponding outpatient encounter (file 409.68)

RETURN("VISIT") – [Numeric] Visit file entry (pointer to file 9000010)

DFN [Required,Numeric] Patient IEN

SD [Required,DateTime] Appointment date/time

SC [Required,Numeric] Clinic IEN

Output

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

Error Codes Returned

APTCOCE >>> You can not check out this appointment.

APTCOTS It is too soon to check out this appointment.

APTCOCN You cannot check out this appointment.

APTCOAC Appointment already checked out

APTCONW Appointment new encounter

CLNNFND Clinic not found.

INVPARAM Invalid parameter value

PATNFND Patient not found.

\$DELCO\$D^SDMAPI4() - Delete check out (scheduling)

This extrinsic function deletes an existing appointment check out.

Format

\$DELCO\$D^SDMAPI4(.RETURN,DFN,SD)

Input Parameters

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

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

RETURN("OE") [Numeric] Pointer to the corresponding outpatient encounter (file 409.68)

DFN	[Required,Numeric] Patient IEN
SD	[Required,DateTime] Appointment date

Output

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

Error Codes Returned

APTCOSU	You must have the 'SD SUPERVISOR' key to delete an appointment check out.
APTDCOD	The appointment must have a check out date/time to delete.
APTDCOO	>>> Editing and deleting old encounters not allowed.
CLNNFND	Clinic not found.
INVPARAM	Invalid parameter value
PATNFND	Patient not found.

2.3 Vocabularies API

\$\$GETAPPT^SDMAPI1() - Get Appointment Type details

This extrinsic function returns detailed information about an appointment type.

Format

\$\$GETAPPT^SDMAPI1(.RETURN,TYPE)

Input Parameters

.RETURN	[Required,Array] Array passed by reference that will receive the data.
	RETURN("NAME") – [String] Appointment type name
	RETURN("NUMBER") – [Numeric] Appointment type IEN
	RETURN("SYNONIM") – [String] Appointment type synonym
TYPE	[Required,Numeric] Appointment type IEN (File 409.1)

Output

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

Error Codes Returned

INVPARAM	Invalid parameter value
TYPNFND	Appointment type not found.

\$\$GETELIG^SDMAPI1() - Return Eligibility Code details

This extrinsic function returns detailed information about an eligibility code.

Format

\$\$GETELIG^SDMAPI1(.RETURN,ELIG)

Latest version available at the [OSEHRA Journal](http://hdl.handle.net/10909/2) [<http://hdl.handle.net/10909/2>]

Distributed under [Creative Commons Attribution License](#)

Input Parameters

.RETURN	[Required,Array] Array passed by reference that will receive the data
RETURN("ABBREVIATION")	[String] Eligibility Code abbreviation
RETURN("MAS ELIGIBILITY CODE")	[Numeric]
RETURN("NAME")	[String] Eligibility Code name
RETURN("PRINT NAME")	[String] Eligibility Code print name
RETURN("TYPE")	[String] Eligibility Code type (N:NON VETERAN,Y:VETERAN)
RETURN("VA CODE NUMBER")	[Numeric] VA Code Number
RETURN("INACTIVE")	[Boolean] Eligibility Code status
ELIG	[Required,Numeric] Eligibility code IEN

Output

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

Error Codes Returned

INVPARAM Invalid parameter value

\$LSTAPPT^SDMAPI1() - List appointment types filtered by name

This extrinsic function returns a list of appointment types. The list can be filtered by name.

Format

\$LSTAPPT^SDMAPI1(.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] Appointment type IEN
RETURN(,"NAME")	– [String] Appointment type name
SEARCH	[Optional,String] Partial match restriction. Default: All entries
START	[Optional,String] The appointment type name 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

\$\$LSTAPPST^SDMAPI1() - List appointment statuses

This extrinsic function returns a list of appointment status codes.

Format

\$\$LSTAPPST^SDMAPI1(.RETURN)

Input Parameters

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

RETURN(0) – [Numeric] # of entries found

RETURN(#) – [String] code^display_name

Output

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

Error Codes Returned

None

\$\$LSTHLTP^SDMAPI1() - List hospital location types

This extrinsic function returns a list of hospital location types.

Format

\$\$LSTHLTP^SDMAPI1(.RETURN)

Input Parameters

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

RETURN(0) – [Numeric] # of entries found

RETURN(#) – [String] code^display_name

Output

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

Error Codes Returned

None

\$\$LSTCRSNS^SDMAPI1() - List cancellation reasons filtered by name

This extrinsic function returns a list of cancellation reasons. The list can be filtered by name.

Format

\$\$LSTCRSNS^SDMAPI1(.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

Latest version available at the [OSEHRA Journal](http://hdl.handle.net/10909/2) [<http://hdl.handle.net/10909/2>]

Distributed under [Creative Commons Attribution License](#)

(consistent with LIST^DIC header node)

RETURN(,"ID") – [Numeric] Cancellation reason IEN

RETURN(,"NAME") – [String] Cancellation reason name

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

START [Optional,String] 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

\$LSTSRT^SDMAPI1() - List scheduling request types

This extrinsic function returns a list of scheduling request types.

Format

\$LSTSRT^SDMAPI1(.RETURN)

Input Parameters

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

RETURN(0) – [Numeric] # of entries found

RETURN(#) – [String] code^display_name

Output

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

Error Codes Returned

None

\$LSTSBCTG^DGSAAPI() - List sharing agreement sub-categories filtered by name

This extrinsic function returns a list of sharing agreement sub-categories. The list can be filtered by name.

Format

\$LSTSBCTG^DGSAAPI (.RETURN,SEARCH,START,NUMBER)

Input Parameters

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

RETURN(0) – [Numeric] # of entries found

RETURN(#) – [String] IEN^name

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

2.4 Electronic Wait List API

\$LIST^SDWLAPI1() - List EWL entries for patient

This extrinsic function returns the list of a patient EWL entries.

Format

\$LIST^SDWLAPI1(.RETURN,DFN,STATUS,BEGIN,END)

Input Parameters

.RETURN [Required,Numeric] Array passed by reference that will receive the data. All fields except 'IEN' are returned in internal^external format.

RETURN	[Numeric] # of entries found
RETURN(,"DISPTYPE")	[String]Disposition type
RETURN(,"IEN")	[Numeric]EWL entry IEN
RETURN(,"INSTITUTION")	[Numeric]Institution
RETURN(,"ORIGDT")	[DateTime] Originating date
RETURN(,"PRIORITY")	[String] Priority (A:ASAP,F:FUTURE)
RETURN(,"STATUS")	[String] Status (O:OPEN,C:CLOSED)
RETURN(,"WAITFOR")	[Numeric] Pointer to Team/Position/Specialty/Clinic depending on Wait List Type
RETURN(,"WLTYPE")	[Numeric] Wait List Type: 1=PCMM Team assignment, 2=PCMM position assignment, 3=service/specialty, 4=specific clinic
DFN	[Required,Numeric] Patient IEN
STATUS	[Optional,String] EWL entry status (O=Open, C=Closed, ""=Both). Default ""
BEGIN	[Optional,DateTime] Start date (originating date)

END [Optional,DateTime] End date (originating date)

Output

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

Error Codes Returned

INVPARAM Invalid parameter value

PATNFND Patient not found.

\$\$DETAIL^SDWLAPI1() – Wait List entry detailed information

This extrinsic function returns detailed information for a EWL entry

Format

\$\$DETAIL^SDWLAPI1(.RETURN,IEN)

Input Parameters

.RETURN [Required] Array passed by reference that will receive the data. All fields are returned in internal^external format.

RETURN("APPTCLERK")	[Numeric] Who made the appointment
RETURN("APPTCLIN")	[Numeric] Appointment clinic
RETURN("APPTCREDSC")	[Numeric] Appointment credit stop code
RETURN("APPTDATE")	[DateTime] Date appointment made
RETURN("APPTINST")	[Numeric] Appointment institution
RETURN("APPTSC")	[Numeric] Appointment stop code
RETURN("APPTSCHED")	[DateTime] Scheduled date of appointment
RETURN("APPTSN")	[String] Appointment station number
RETURN("APPTSTATUS")	[String] Appointment status
RETURN("CHDCLINP")	[Numeric] Changed clinic parent pointer
RETURN("CMNTS")	[String] Comment
RETURN("DISPBY")	[Numeric] Dispositioned by
RETURN("DISPDT")	[DateTime] Date dispositioned
RETURN("DISPTYPE")	[String] Disposition
RETURN("DNRCMT")	[String] Do not remove comment
RETURN("DNRDT")	[DateTime] Do not remove date
RETURN("DNRRSN")	[String] Do not remove reason

Latest version available at the [OSEHRA Journal](http://hdl.handle.net/10909/2) [<http://hdl.handle.net/10909/2>]

Distributed under [Creative Commons Attribution License](#)

RETURN("DNRUSR")	[Numeric] User entering no remove
RETURN("DSRDDT")	[DateTime] Desired date of appointment
RETURN("ENTEREDBY")	[Numeric] Originating user
RETURN("INSTITUTION")	[Numeric] Institution
RETURN("ORIGDT")	[DateTime] Originating date
RETURN("PATIENT")	[Numeric] Patient
RETURN("PRIORITY")	[String] Priority
RETURN("PROVIDER")	[Numeric] Provider
RETURN("REOPENCMT")	[String] Reopen comment
RETURN("REOPENRSN")	[String] Reopen reason
RETURN("REQBY")	[Numeric] Request by
RETURN("SCPRIORITY")	[Boolean] Service connected priority
RETURN("STATUS")	[String] Status
RETURN("WAITFOR")	[Numeric] Pointer to Team/Position/Specialty/Clinic depending on Wait List Type
RETURN("WAITFORP")	[String] Returned as internal^external value. Can be clinic_stop_IEN^clinic_stop_name if WL Type is '3' or clinic_IEN^clinic_name if type is '4'
RETURN("WLTYPE")	[Numeric] Wait List Type: 1=PCMM Team assignment, 2=PCMM position assignment, 3=service/specialty, 4=specific clinic

IEN [Required,Numeric] EWL entry IEN

Output

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

Error Codes Returned

INVPARAM Invalid parameter value

\$\$NEW^SDWLAPI1Q – Add new EWL entry

This extrinsic function creates a new EWL entry

Format

\$\$NEW^SDWLAPI1(.RETURN,.SDWLD)

Input Parameters

.RETURN	[Required,Numeric]	Will return the new IEN if the call succeeded, 0 otherwise
.SDWLD	[Required,Array]	Array containing the data to be saved
SDWLD("WLTYPE")	[Numeric]	Wait List Type
SDWLD("PATIENT")	[Numeric]	Patient
SDWLD("INSTITUTION")	[Numeric]	Institution
SDWLD("WAITFOR")	[Numeric]	Pointer to Team/Position/Specialty/Clinic depending on Wait List Type
SDWLD("PRIORITY")	[String]	Priority
SDWLD("REQBY")	[Numeric]	Request by
SDWLD("PROVIDER")	[Numeric]	Provider
SDWLD("SCPRCNT")	[Numeric]	Service connected percentage
SDWLD("SCPRIORITY")	[Boolean]	Service connected priority
SDWLD("DSRDDT")	[DateTime]	Desired date of appointment
SDWLD("CMNTS")	[String]	Comments
SDWLD("ENRSTAT")	[String]	EWL enrollee status
SDWLD("ENRDU")	[DateTime]	EWL enrollee date used
SDWLD("ENRDF")	[String]	EWL enrollee database file
SDWLD("TICKLER")	[Boolean]	Scheduling reminder flag
SDWLD("CHDCLINP")	[Numeric]	Changed clinic parent pointer

Output

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

Error Codes Returned

INVPARAM Invalid parameter value

\$\$UPDATE^SDWLAPI1() – Update EWL entry

This extrinsic function returns a list of cancellation reasons. The list can be filtered by name.

Format

\$\$UPDATE^SDWLAPI1(.RETURN,SDWLIEN,.SDWLD)

Input Parameters

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

SDWLIEN	[Required,Numeric] IEN of the EWL entry to be updated
.SDWLD	[Required,Array] Array containing the data to be saved
SDWLD("WLTYPE")	[Numeric] Wait List Type
SDWLD("INSTITUTION")	[Numeric] Institution
SDWLD("WAITFOR")	[Numeric] Pointer to Team/Position/Specialty/Clinic depending on Wait List Type
SDWLD("PRIORITY")	[String] Priority
SDWLD("REQBY")	[Numeric] Request by
SDWLD("PROVIDER")	[Numeric] Provider
SDWLD("SCPRCNT")	[Numeric] Service connected percentage
SDWLD("SCPRIORITY")	[Boolean] Service connected priority
SDWLD("DSRDDT")	[DateTime] Desired date of appointment
SDWLD("CMNTS")	[String] Comments
SDWLD("ENRSTAT")	[String] EWL enrollee status
SDWLD("REJECTED")	[Boolean] Rejection flag
SDWLD("TICKLER")	[Boolean] Scheduling reminder flag
SDWLD("INTRATF")	[Boolean] Intra-transfer flag
SDWLD("MULTITEAM")	[Boolean] Multi team flag

Output

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

Error Codes Returned

INVPARAM Invalid parameter value

\$\$DISP^SDWLAPI1() – Disposition entry

This extrinsic function update the disposition data for an EWL entry.

Format

\$\$DISP^SDWLAPI1(.RETURN,SDWLDFN,SDWLIEN,SDWLDISP,.SDWLAPPT)

Input Parameters

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

SDWLDFN [Required,Numeric] Patient IEN

SDWLIEN [Required,Numeric] EWL entry IEN

Latest version available at the [OSEHRA Journal](http://hdl.handle.net/10909/2) [<http://hdl.handle.net/10909/2>]

Distributed under [Creative Commons Attribution License](#)

SDWLDISP [Required,String] Disposition type (D:DEATH, NC:REMOVED/NON-VA CARE, SA:REMOVED/SCHEDULED-ASSIGNED, CC:REMOVED/VA CONTRACT CARE, NN:REMOVED/NO LONGER NECESSARY, ER:ENTERED IN ERROR, TR:TRANSFERRED)

.SDWLAPPT [Optional,Array] Array containing appointment data (saved if disposition type is "SA")

Output

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

Error Codes Returned

INVPARAM Invalid parameter value

\$\$DELETE^SDWLAPI1Q – Delete EWL entry

This extrinsic function deletes an existing EWL entry

Format

\$\$DELETE^SDWLAPI1(.RETURN,SDWLIEN)

Input Parameters

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

SDWLIEN [Required,Numeric] EWL entry IEN

Output

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

Error Codes Returned

INVPARAM Invalid parameter value

\$\$HASENTRY^SDWLAPI1Q – Patient is on EW List?

This extrinsic function checks if patient has entries on the Electronic Wait List

Format

\$\$HASENTRY^SDWLAPI1(.RETURN,DFN)

Input Parameters

.RETURN [Required,Boolean] Set to 1 if the patient has EWL entries on file, 0 otherwise

DFN [Required,Numeric] Patient IEN.

Output

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

Error Codes Returned

INVPARAM Invalid parameter value

2.5 Team API

\$\$LSTAPOS^SCTMAPI1Q - List active team positions filtered by name

This extrinsic function returns a list of active team positions. The list can be filtered by name.

Format

`$$LSTAPOS^SCTMAPI1(.RETURN,SEARCH,START,NUMBER)`

Input Parameters

.RETURN [Required,Array] Array passed by reference that will receive the data. All fields except 'ID' are returned in internal^external format.

RETURN(0) – [Numeric] # of entries found

RETURN(,"ID") – [Numeric] Team position IEN

RETURN(,"CLINIC") – [Numeric] Associated clinic IEN

RETURN(,"NAME") – [String] Team position name

RETURN(,"TEAM") – [String] Team name

RETURN(,"USER") – [String] Practitioner IEN

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

SEARCH(0) – [Optional,Numeric] Team IEN

SEARCH(1) – [Optional,Boolean] If 1 returns only primary care positions.

START [Optional,Numeric] The team position name 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

\$\$LSTATMS^SCTMAPI1() - List active teams filtered by name

This extrinsic function returns a list of active teams. The list can be filtered by name.

Format

`$$LSTATMS^SCTMAPI1(.RETURN,SEARCH,START,NUMBER)`

Input Parameters

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

RETURN(0) – [Numeric] # of entries found

RETURN(,"ID") – [Numeric] Team IEN

RETURN(,"NAME") – [String] Team name

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

SEARCH(0) – [Optional,Boolean] If 1 returns only primary care teams

START [Optional,Numeric] The team name 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

\$\$GETEAM^SCTMAPI1() – Get team details

This extrinsic function returns detailed data for a team.

Format

\$\$GETEAM^SCTMAPI1(.RETURN,SCTM)

Input Parameters

.RETURN [Required,Array] Array passed by reference that will receive the data in internal^external format

RETURN("AUTO-ASSIGN FROM ASSC CLINICS?") – [Boolean] Autoassign patients from associated clinics

RETURN("CAN ACT AS A PC TEAM?") – [Boolean] Can act as primary care team for a patient

RETURN("CLOSE TO FURTHER ASSIGNMENT?") – [Boolean] Indicates if team can be assigned additional patients

RETURN("CURRENT # OF PATIENTS") – [Numeric] # of patients currently assigned to this team

RETURN("CURRENT ACTIVATION DATE") – [DateTime] Activation date

RETURN("CURRENT EFFECTIVE DATE") – [DateTime] The most recent date that the status has changed

RETURN("CURRENT INACTIVATION DATE") – [DateTime] Inactivation date as of today

RETURN("CURRENT STATUS") – [String] Status (Active, Inactive)

RETURN("DEFAULT TEAM PRINTER") – [Numeric] Printer IEN (pointer to DEVICE file)

RETURN("DESCRIPTION") – [String] Team description

RETURN("DISCHARGE FROM ASSOC. CLINICS?") – [Boolean] Auto discharge from team when discharge from associated clinic?

RETURN("INSTITUTION") – [Numeric] Site IEN (pointer to INSTITUTION file)

RETURN("MAX % OF PRIMARY CARE PATIENTS") – [Numeric] Maximum percentage of patients that this team should be assigned

Latest version available at the [OSEHRA Journal](http://hdl.handle.net/10909/2) [<http://hdl.handle.net/10909/2>]

Distributed under [Creative Commons Attribution License](#)

RETURN("MAX NUMBER OF PATIENTS") – [Numeric] Maximum allowable number of patients for this team

RETURN("NAME") – [String] Team name

RETURN("RESTRICT CONSULTS?") – [Boolean] Prevents making consult appointments to clinics in which the patient is not enrolled

RETURN("SERVICE/DEPARTMENT") – [Numeric] Service/Section IEN (pointer to SERVICE/SECTION file)

RETURN("TEAM PHONE NUMBER") – [String] Phone

RETURN("TEAM PURPOSE") – [Numeric] Primary role of team (pointer to TEAM PURPOSE file)

SCTM [Required,Numeric] Team IEN

Output

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

Error Codes Returned

INVPARAM Invalid parameter value

\$\$GETEAMPO^SCTMAPI1Q – Get team position details

This extrinsic function returns a detailed information for a team position.

Format

\$\$GETEAMPO^SCTMAPI1(.RETURN,SCTMPO)

Input Parameters

.RETURN [Required,Array] Array passed by reference that will receive the data in internal^external format

RETURN("*PRECEPTOR POSITION") – [Numeric] Position IEN of the team position responsible for supervising this position

RETURN("ASSOCIATED CLINIC") – [Numeric] Associated clinic IEN (pointer to HOSPITAL LOCATION file)

RETURN("BEEPER NUMBER") – [String] Pager/beeper number

RETURN("CAN ACT AS PRECEPTOR?")- [Boolean] Set to 1 if this position may be used as a preceptor position

RETURN("CONSULT MESSAGE") – [String] For which patients team receives messages related to patient activity in clinics in which he is not enrolled (T:TEAM'S PATIENTS, P:POSITION'S PATIENTS, N:DO NOT SEND)

RETURN("CURRENT # OF PATIENTS") – [Numeric] # of all patients associated with the team

RETURN("CURRENT # OF PC PATIENTS") – [Numeric] # of primary care patients

Latest version available at the [OSEHRA Journal](http://hdl.handle.net/10909/2) [<http://hdl.handle.net/10909/2>]

Distributed under [Creative Commons Attribution License](#)

RETURN("CURRENT ACTIVATION DATE") – [DateTime] Activation date as of today

RETURN("CURRENT EFFECTIVE DATE") – [DateTime] Effective date as of today

RETURN("CURRENT INACTIVATION DATE") – [DateTime] Inactivation date as of today

RETURN("CURRENT STATUS") – [String] Status (Active, Inactive)

RETURN("DEATH MESSAGE") – [String] For which patients team receives messages related to patient's death (T:TEAM'S PATIENTS, P:POSITION'S PATIENTS, N:DO NOT SEND)

RETURN("FUTURE # OF PATIENTS")- [Numeric] # of current and future assignments

RETURN("FUTURE # OF PC PATIENTS") – [Numeric] # of current and future patient care assignments

RETURN("INPATIENT MESSAGE") – [String] For which patients team receives messages related to inpatient activity (T:TEAM'S PATIENTS, P:POSITION'S PATIENTS, N:DO NOT SEND)

RETURN("MAX NUMBER OF PATIENTS") – [Numeric] Maximum number of patients that can be assigned to this position

RETURN("POSITION")="OIF OEF CLINICAL CASE MANAGER^OIF OEF CLINICAL CASE MANAGER"

RETURN("POSITION DESCRIPTION") – [String] Description

RETURN("POSSIBLE PRIMARY PRACTITIONER?") – [Boolean] If 1 this position may be used as preceptor for the team

RETURN("PRECEPTOR CONSULT MESSAGE") – [Boolean] 1 sends a message to preceptor on consult activity

RETURN("PRECEPTOR DEATH MESSAGE") – [Boolean] 1 sends a message to preceptor on a death entry

RETURN("PRECEPTOR INPATIENT MESSAGE") – [Boolean] 1 sends a message to preceptor on inpatient activity

RETURN("PRECEPTOR TEAM MESSAGE") – [Boolean] 1 sends a message to preceptor on team activity

RETURN("STANDARD ROLE NAME") – [Numeric] Standard role IEN (pointer to ROLE POSITION file)

RETURN("TEAM") – [Numeric] Team IEN (pointer to TEAM file)

RETURN("TEAM MESSAGE") – [String] For which patients team receives messages related to team activity (T:TEAM'S PATIENTS, P:POSITION'S PATIENTS, N:DO NOT SEND)

RETURN("USER CLASS") – [Numeric] Pointer to USER CLASS file

SCTMPO [Required,Numeric] Team position IEN

Output

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

Error Codes Returned

INVPARAM Invalid parameter value

TMPONFND Team position not found.

2.6 Encounter utilities API

\$\$GETSCAP^SDMAPI1() – Get clinic appointment

This extrinsic function returns detailed information for an appointment.

Format

\$\$GETSCAP^SDMAPI1(.RETURN,SC,DFN,SD)

Input Parameters

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

RETURN	[Boolean] Set to 1 if the the call succeeded, 0 otherwise
RETURN("CHECKIN")	[DateTime] Check in date
RETURN("CHECKOUT")	[DateTime] Check out date
RETURN("CONSULT")	[Numeric] Consult associated with this appointment (pointer to REQUEST/CONSULTATION FILE <#123>)
RETURN("DATE")	[DateTime] Date appointment made
RETURN("IFN")	[Numeric]Clinic appointment IEN
RETURN("LENGTH")	[Numeric] Appontment length (minutes)
RETURN("USER")	[Numeric]Data entry clerk IEN

SC [Required,Numeric] Clinic IEN

DFN [Required,Numeric] Patient IEN

SD [Required,DateTime] Appointment date/time

Output

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

Error Codes Returned

INVPARAM Invalid parameter value

PATNFND Patient not found.

CLNNFND Clinic not found.

\$\$DISCH^SDMAPI3() – Discharge from clinic

This extrinsic function discharges a patient from the clinic he is enrolled in.

Format

\$\$DISCH^SDMAPI3(.RETURN,DFN,SD,SC,RSN)

Input Parameters

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

.ENS [Optional,Array]

ENS(clinic_ien,"IEN") [Numeric] Enrollment IEN

ENS(clinic_ien,"EN",#,"DISCHARGE") [DateTime] Date of discharge

ENS(clinic_ien,"EN",#,"REASON") [String] Reason for discharge

DFN [Required,Numeric] Patient IEN (pointer to file 2)

SD [Required,DateTime] Discharge date

SC [Optional,Numeric] Enrollment clinic IEN (pointer to file 44)

RSN [Optional,String] Reason for discharge

Output

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

Error Codes Returned

INVPARAM Invalid parameter value

PATNFND Patient not found.

PATDARD PATIENT ALREADY DISCHARGED FROM CLINIC

PATDNEN Patient not enrolled in clinic.

PATNAEAC Patient is not actively enrolled in any clinics.

PATDHFA PATIENT HAS FUTURE APPOINTMENTS, MUST BE CANCELLED PRIOR TO DISCHARGE !!

\$\$GETPENRL^SDMAPI3() – Get patient enrollments filtered by status

This extrinsic function returns the list of a patient enrollment events filtered by clinic and enrollment status.

Format

\$\$GETPENRL^SDMAPI3(.RETURN,DFN,SC,STAT)

Input Parameters

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

Latest version available at the [OSEHRA Journal](http://hdl.handle.net/10909/2) [<http://hdl.handle.net/10909/2>]

Distributed under [Creative Commons Attribution License](#)

RETURN	[Boolean] Set to 1 if the the call succeeded, 0 otherwise
RETURN(clinic_ien,"EN",#,"DISCHARGE")	[DateTime] Date of discharge
RETURN(clinic_ien,"EN",#,"ENROLLMENT")	[DateTime] Date of enrollment
RETURN(clinic_ien,"EN",#,"OA")	[String] Outpatient/Ambulatory (O: outpatient, A: ambulatory care)
RETURN(clinic_ien,"EN",#,"REASON")	[String] Reason for discharge
RETURN(clinic_ien,"EN",#,"REVIEW")	[DateTime] Review date
RETURN(clinic_ien,"IFN")	[Numeric] Enrollment IEN
RETURN(clinic_ien,"NAME")	[String] Enrollment clinic name
RETURN(clinic_ien,"STATUS")	[String] Enrollment status (I: inactive)
DFN	[Required,Numeric] Patient IEN
SC	[Optional,Numeric] Clinic IEN
STAT	[Optional,String] Status (0: both active and inactive, 1: active only)

Output

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

Error Codes Returned

INVPARAM	Invalid parameter value
PATNFND	Patient not found.

\$\$GETOE^SDMAPI4() – Get outpatient encounter data

This extrinsic function returns detailed information about an outpatient encounter.

Format

\$\$GETOE^SDMAPI4(.RETURN,SDOE)

Input Parameters

.RETURN	[Required] Array passed by reference that will receive the data
RETURN	[Boolean] Set to 1 if the the call succeeded, 0 otherwise
RETURN("CLINIC")	[Numeric] Clinic IEN
RETURN("DATE")	[DateTime] Encounter date/time

	RETURN("PATIENT")	[Numeric] Patient IEN
	RETURN("SCODE")	[Numeric] Clinic stop code
	RETURN("VISIT")	[Numeric] Visit IEN
SDOE	[Required,Numeric] Outpatient encounter IEN	

Output

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

Error Codes Returned

INVPARAM	Invalid parameter value
OENFND	Outpatient encounter not found.

3. GLOSSARY

IEN	Internal Entry Number. The number used to identify an entry within a file. Every record has 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 Appointment Management 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 - 1. The errors have the following form:

RETURN(#)=ErrorId^Message^Level

Example

INVPARAM^Invalid parameter value – SDWLDFN^1

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:\SD_5.3_260003_RC4_MB.KID and load the distribution.
6. Use the *Install Package(s)* option and select SD*5.3*260003
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.