

FHIR on VistA Getting data out of VistA through a FHIR API

WorldVistA Presentation June 5, 2019





FHIR on VistA OSEHRA open source group

- Purpose: Develop and promote standards-based FHIR APIs on the VistA platform for high-value data sets and aligning previously developed VistA APIs to the current FHIR standards to promote interoperability across platforms and systems.
- Sponsored by Perspecta
- Lead by Brian Morgan





Motivation for Building VistA FHIR API





HealthConcourse Conceptual Architecture



VistA FHIR API Data Flow





VistA REST Tech Stack



VistA RPCs (getters) Exposed as Web Services



perspecta

Get One Care Team Get All Care Teams Get Institution Info by Hospital Location Name Get Mapped Code Get Allergies for Patient by ICN Get Appointments for Patient by ICN Get Condition/Problem SCT for Patient by Traits Get Condition/Problem for Patient by ICN Get Patient Care Plan for Traits and Visit ID Get Patient Care Plans for Traits Get Patient Care Plans for ICN Get Patient Care Plan for ICN and Visit ID Get Demographics for One Patient by Traits Get Patient Demographics for All Patients Get Demographics for One Patient by ICN Get Patient Demographics for Range of Patients Get Diagnostic Report for Patient by ICN Get Encounters for Patient by ICN Get Flags for Patient by ICN Get Goals for Patient by ICN Get Health Factors for Patient by Traits Get Health Factors for Patient by ICN Get Immunizations for Patient by ICN Get Labs for Patient by Traits Get Labs for Patient by ICN Get Medication Administration for Patient by ICN Get Medication Dispense for Patient by ICN Get Medication Statement for Patient by ICN Get Patient Observations by Traits Get Patient Observations by ICN Get Procedures for Patient by Traits Get Procedures for Patient by ICN Get Encounter Providers for Patient by ICN Get Patients for Condition Get Patient Notes by ICN Validate Patient for Traits Get Vitals for Patient by Traits Get Vitals for Patient by ICN Get VistA record for a FHIR Resource ID

Get Procedures for Patient by ICN

The return for this getter aggregated the following data for a patient

- Surgical Procedures
- Visit Procedures
- Radiology Procedures
- Radiology Reports

VistA JSON Example



🗩 perspecta..

"Vitals": { "dateTimeVitalsEntered": "FEB 07, 2011@17:19:27", "dateTimeVitalsEnteredFHIR": "2011-02-07T17:19:27-05:00", "dateTimeVitalsEnteredFM": 3110207.171927. "dateTimeVitalsEnteredHL7": "20110207171927-0500". "dateTimeVitalsTaken": "FEB 07, 2011@17:19:27", "dateTimeVitalsTakenFHIR": "2011-02-07T17:19:27-05:00", "dateTimeVitalsTakenFM": 3110207.171927, "dateTimeVitalsTakenHL7": "20110207171927-0500". "enteredBy": "PROVIDER, ONE", "enteredBvId": 983. "enteredInError": "", "enteredInErrorCd": "". "errorEnteredBy": "", "errorEnteredById": "", "hospitalLocation": "", "hospitalLocationId": "GENERAL MEDICINE", "patient": "ZBONCAK558,LEROY603", "patientICN": "2670708297V958542", "patientId": 102251, "rate": 71. "resourceld": "V 500 120.5 49526", "resourceType": "Observation", "supplementalO2": "", "vitalType": "HEIGHT", "vitalTypeId": 8, "vitalTypeSCT": 50373000, "vitalTypeSc": "Height", "vitalslen": 49526

{

VistA FHIR API App Architecture



🗩 perspecta...

Available FHIR resources

Direct Resources

- Patient
- Care Team
- Condition
- Observation
- Location

Containers in Patient

- Condition
- Encounter
- Practitioner
- Observation
- Medication Statement
- Medication Dispense
- Medication Administration
- Composition

- Procedure
- Flag
- Appointment
- Allergy Intolerance
- Immunization
- Goal
- CarePlan
- Diagnostic Report



Demo 1: Patient = "EHMP Five"

Patient Viewed in CPRS

VistA CPRS in use by: Provider	,Eight (vista-ssh.d	emo.openplatfo	orm.healthcar	e)			-	
<u>File Edit View Tools H</u> elp								
EHMP,FIVE (INPATIENT) A 666-11-0005 Dec 18,1989 (29) F	NHCU NH15-B Provider: PROVIDEF	,EIGHT (h	o PACT assign npatient) Attend	ed at any VA location / ling: Provider,Ten - (Inpa	tient) Provider: Provider,Nine		Flag VistaWeb Remote Data	Postings D
Active Problems		Allergies / Adver	se Reactions				Postings	
Enlepsy ISCT 94757009) Carpal Tunnel Syndrome (SCT 574) *Alcohol Abuse (SCT 15167005) *Malignant Melanoma (SCT 372244) Postraumatic Stress Disorder (SCT Anputation Of Leg Through Tbia A 0/Z - Amputated Left Leg (SCT 30) Closed Fracture Of C1-C4 Level Wi	06009) 006) 47505003) xnd Fibula (SCT 883 8094003) th Spinal Cord Injury.	No Known Aller	gies				Advance Directive Comp	leted
Active Medications			Clinical Remin	ders	Due Date			
No Active Medications Found			Hepatitis C risl Primary Care I Evaluation of TBI Screening	k Factor Screening Depression Screening Imbedded Fragments	Feb 02.13 DUE NOW DUE NOW DUE NOW DUE NOW			
Recent Lab Results		Vita	ls			Appointments/Visit	s/Admissions	
[Cbc Blood Wc Lb #18513 Chem 7 Blood Serum Wc Lb #18513 Culture & Susceptibility Unive Wc Lb #1 Culture & Susceptibility Swab RIe Wou Sgot Blood Serum ILb #18436 thiv Westem BloB Blood Wc Lb #18433 Cbc Blood Wc Lb #18433 Culture & Susceptibility Scrab Tobia Wc Culture & Susceptibility Sirab Tobia Wc Culture & Susceptibility Unive Wc Lb #1 Horpathic CArtholody Blood Wc Lb #18417 Chem 7 Blood Serum Wc Lb #119417 Cbe Blood Serum Wc Lb #119417 Cbe Blood Serum Wc Lb #119417	Mar 14,15 Mar 14,15 18439 db #14,15 18439 db #14,42 Aug 01,14 Aug 01,14 Aug 01,14 Aug 01,14 Aug 01,14 Aug 10,10 Apr 10,10 Apr 10,10 Apr 10,10 Apr 10,10 Apr 10,10 Feb 01,10 Feb 01,10	T P B HT W P N B B B B	98.8 F 82 14 158/91 72 in 467.4 lb 3 × 92 I 63.52	Jun 15,2015 17:46(3) Jun 15,2015 17:46 Jun 15,2015 17:46 Jun 15,2015 17:46 Aug 31,2014 14:05 Oct 03,2017 00:00(21 Jun 15,2015 17:46 Mar 20,2015 17:37 Oct 03,2017 00:00	(182.88 cm) (182.88 cm) 2.01 kg)	Mar 14,15 09:26 Sep 10,14 14:00 Aug 31,14 14:00 Aug 01,14 14:53 Aug 01,14 14:53 Feb 01,10 06:23 Feb 01,10 10:34	Inpatient StayNhou Mental Health Action P Primary Care Checked Out Inpatient Stay3 North Surg Emergency Room Inpatient Inpatient StayGen Med	(Appointment
Cover Sheet Problems Meds O	rders Notes Cons	ults Surgery [D/C Summ La	abs Reports				



Demo 2: Patient = "EHMP Five"

FHIR on VistA APIs

 Get Patient: <u>https://vista-</u> <u>fhir.demo.openplatform.he</u> <u>althcare/api/Patient/50000</u> <u>00352V586511/</u>

• Get Conditions:

https://vistafhir.demo.openplatform.he althcare/api/Patient/50000 00352V586511/Condition

C A https://with.fbir.domo.onenelatform.basiltheare/sou/Patient/S00000	1/
O O O O O O	🤌 Patie
Apps 🛄 Dev (old) 🛄 Dev 🛄 Demo stagling 🛄 Demo 🛄 Henerences 🕡 HSHC Sandbox	< →
nargungaTuna", "Dat(ast"	
id": "500000352V586511",	tt: Apps
seta": (Tuessian Id": Ti"	{
"tag": ["resour
Printer T. Trans. doc indeter annex?	"meta":
"display": "VistA"	"last
	"type":
	"total"
text": {	(
"div": " <div xmlns='\"http://wnw.wB.org/1999/xhtml\"'><div class='\"hapiHeaderText\"'>FIVE EHNP</div></div>	
<pre>>>>>>>>><t< td=""><td>}</td></t<></pre>	}
JR MICHIGAN JR MICHIGAN JR MICHIGAN 	1.
"	(
identifier": [- 1
"system": "uro:dx::vista:ico".	
"value": "5000000352v586511"	
],	
"type": (
coolng : [
"system": "http://hl7.org/fhir/identifier-type",	
<pre>code : 58 }</pre>	
, 1	
"value": "555-555-1234"	
name": [
{ "familu", "fuero".	
"given": [
"FIVE"	
3	
render": "male".	
oirthDate": "1989-12-18",	
idaress": [
"line": [
"12345 ANY STREET"	
"city": "ANN ARBOR",	3
"state": "MICHIGAN", "postalCode": "48103"	}
Contract and the second	2.





Demo 3: Patient = "EHMP Five"

ClinFHIR Using FHIR on VistA APIs – ClinFHIR: <u>http://clinfhir.com/</u>

CertoPHB Laurateur CertoPHB Laurateu	In such as a lot by reporter type, por 4 specific and observations, reveal, so that the specific and the specific and the specific and the specific and the specific and the specific and the specific and the distance of the specific and the specific and the distance of the specific and the specific and the distance of the specific and the specif	Institutional and the second s	Crent Mores Dis Servir Certenases Servir Hattige Nervir Ad Servir Prift, Usa Jopen Kiner Vall Nit Sprinklane particip Strad Sprinklane Prift i sa	Annual An	0 0 0 0 0 0
Main Molece (point in service) Experimental includes (point in service) Propert View Dogs (relevance for a point pairon, service or deferring with Prover all includes (point in service) There all includes (point includes (point)) Prover all includes (point) Prover all includes (point)	a such as a tot by resource type, jour a popularial intellicition or vers. for this popularial resources the implicities the improvement constant and prevention as to approve advertised prevention of the popularial position potential prevention of the program Bis is a recent program.	Incommensation and an analysis of the lange	Cuerris science Des Server Conformance Server Medicalizes Terrer Add Server PHR Links (Spen Kreyr LB) Field Science STUD Server Name STUD Server Name STUD Server Name STUD Server Name	PHFI as VMA PHFI as VMA Obtained (termology) Set at the same they on 0.141 1140 Date Frift bat	0 0 at the Outa be
Heart Veter Department for a plotter paper, ways a number of other over the same accurate by spatial, ways a number of administration ways and a securate by spatial, and a securate by spatial, and a securate by the same a loss of odd one of the spatial, and administration administration Augershall for quarks again administration Augershall for quarks again administration administration Augershall for quarks again administration administrat	a soch as a Bitt by resource type, pan gradinal mithoranity vers. Hart ter paterix wey builder The response can be granised a specific agreed workshot in can be retering a bit tere proper workshot in can be retering a bit tere proper workshot types available (schuling profiles) area be to accord or progress matching in another profiles and types available (schuling profiles) area	Home resources are source on the land show the source should support the Anomicle way long and that sources provide and account any long and that sources provide and account any long and that sources are used as a source provide source of the and the sources are sources and Analog sources that are source Cause a Doubrief	Data Server Conformance Server Add Server Add Server PHR Links (speen in new Lill) Field Speenback STUUS Speenback STUUS Speenback STUUS Speenback	Plath on Visika PHER on Visika Ontonerver (berninskop) bet all the same rikey on FLAT FLAT Cost FLAT Cost	at the Data 3
Theme is also the option is over a new panet, and is over a new panet. Theme is also the option is option any new panet oper New	No that public. In y builder. The response can be greated a popolitic density and can be rearding at the popole understand types available (shoulding profiles) are the is a work of popgers. In can response by requirement in a	RetentServeything specifies Can access any compared theS werver (weak exceed 4 capacity) Selections; Funders into makes the Cabla Server Systems of the Conformance energy (Selections) and the Terrorisation accession accession accession accession accession Accession accession accession Course a Document	Residency Server Add Server PHR Links (open in new Sat) Ella Specification parametry STAS Specification STAS Specification Free run	Ontoserver (hermittidagy) Tel al the same Harry on Thetty Frist Chart Frist Chart	at the Data 1
Environ Claim Experie to refer quarks grand any Pert unive to claim a segment of the transmission	ny bolder. The response can be present a specific dearse scenaria, it can be reterion is the posper understand types available (including profiles) are Mikili is a work in progress. Incluse interspecific requirement in a	Can access any compared five's server (med expose a Capacity (Steerent) Frances (Intrinsiend in Steerent Systems on the Conformance server, Valueties on the Teaminity warver. Canada structure data ta a compare Adding storcured data is a compare Cinada a Document	Add Server PHIR Links (open in new tab) In the Opening (users) STU-3 Specification STU-3 Specification STU-3 Specification STU-3 Specification	Set all the same rise on the state Finis Char Finis Char Finis Char	at the Data 3
tensors laster ten Societa batteria una 5 per algorithe finanziaria sociatate in de con elessors sur a finanza ad coga monaria el dona fina in here exercise con ella a dista al logi, anti ta validate fina finanziaria here incluso e lastica al logi anti ta validate fina finanziaria Marte del fina datteri atti tasa issues atti more emplere escora figura - ten degla monaria del aste del logi anti a con ella monaria del logi a ten degla monaria del logi ad logi anti a con ella monaria del logi anti ten degla monaria del logi ad logi ten degla monaria del logi ad logi del logi ad logi del logi ad logi del logi ad logi a	prinant a specific damas scenars. It can be intertion is to help people understand types available (including profiles) are lifes is a work in progress. Intrust interspersolity requirement in a	Prinent internation is set the Data Server Profiles on the Contournance server. Valuetiers on the Tenthinizing varies Crimite a surple scenario Adding structured data to a variance Cristie a Docament	PHIR Links (open in new tab) Ris Specification (starent) STU-3 Specification STU-3 Specification THER settle	Harry constrainty 17 (GR-Chart Freidi org	
Logical Modelier The Logical modelier about the creation of a model that represents a partitional field to entry to see. FMRT statistypes, and can be loaded and the field to entry to see FMRT statistypes, and can be loaded and the field to entry the model built set of the second provide to be the set.	rticular interoperatility requirement in a			Charana Workshep	
of the profiling compowerts required by Philip	an existing resource type or completing of can act as the basis for the generation.	Abose are caved on the Contomance Server Can reference ValueSets from the Terminology server Courter an information Moder Circule a Resources Moder	dimining Videos opport in new tada Somarco Danser Adding structures data Logical Association		
Implementation Guide Display the concerns of an implementation Guide, and the instalonation b minimeter	between the contents of the Guide.	The improventiation guide, profiles and Extension Defendions are on the Contomance Server, the terminology resources (og ValueSet) are on the Terminology Server	RCSTM garry list Note that some of these videos me the current functionality	ly describe earlier versions, as may not i	unpetely ne
Durche Visueltar Various displays for the contents of a buncle. Bundles can be parted into data server	e the viewer and optionally saved in the		Other Inits		
Edension Definition Views and builts extension definitions. These can be defined and applies tuilities ment to be included in the generated Profile.	it to the Logical Model, which will allow	Extension definitions are saved on the Containance Server	SHELP (Terrandage bound)		
Cubitiyuner balaxis The Celebryane defines a set of Concepts tions which a VisueSet prov- element. The actual twoding between Coordinates and element is cone you to build (and edd) a Codedystem, and optionally balant the ValueSet	des pointble volues for a resource og nie Volueslet. This component allows t as well.	Codelflystems are saved on the Terrahology Server			
valuetiet exponer Lets you view existing valuetiets. The outper works best with ship/upp	cat the moment,	valuebets are stored on the Terminology Server			

 Patient Viewer HealthConcourse → C ▲ Not secure 	x dinfhir.com/pat	Llauncher X de Patient Viewer X 🖃 https://vista-f	hir.demo.openpl
Apps 🧾 Dev (old) 📃 Dev	📴 Demo Stagin	g 🧧 Demo 🧧 References 🤣 HSPC Sandbox	
Patient Viewer		FIVE EHMP male 1989-12-18 (5000000352V586511)	
Resource explorer Resou	rce references (graph Numeric Observations/Vitals Encounter timeline FHIRPath	Documents
Resource Types		Condition resources	
Appointment	Θ	UNSPECIFIED LOWER LIMB AMPUTATION STATUS [V49.70]	
Composition	63	lilness, unspecified (R69.)	
Condition	-	Illness, unspecified [R69.]	
Encounter	Ø	Illness, unspecified [R69.]	
Immunization		CLOSED FRACTURE OF C1-C4 LEVEL WITH UNSPECIFIED SPINAL	
MedicationAdministration	0		
MedicationDispense	6	EPILEPST, UNSPECIFIED, WITHOUT MENTION OF INTRACTABLE EPILEPSY [345:90]	
MedicationStatement	Ø	BELOW KNEE AMPUTATION STATUS [V49.75]	
Observation	73	PROLONGED POSTTRAUMATIC STRESS DISORDER [309.81]	
Patient	0	MELANOMA OF SKIN, SITE UNSPECIFIED [172.9]	
Practitioner	Ð	CARPAL TUNNEL SYNDROME [354.0]	
Procedure	Ø	ALCOHOL ABUSE, UNSPECIFIED DRINKING BEHAVIOR [305.00]	



Demo 4: Patient = "EHMP Five"

Perspecta HealthConcourse Using FHIR on VistA APIs - HealthConcourse Viewer: https://clinical-

viewer.demo.openplatform.healthcare/search





Perspecta Proprietary Information



Thank you

Bo Dagnall CTO, Provider Segment, Perspecta Bo.Dagnall@perspecta.com 951 764 5242



