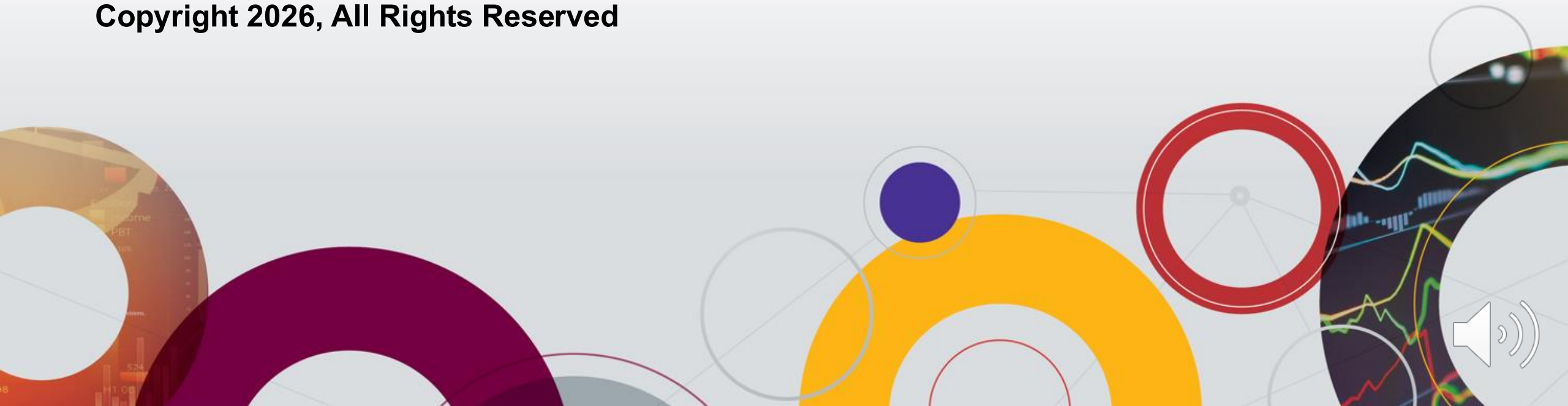


3.3 EHR Examples and Marketplace

10x10 – Introduction to Biomedical Informatics & Artificial Intelligence
William Hersh, MD, FACMI, FAMIA, FIAHSI
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Examples of the EHR

Using Veterans Health Information Systems and Technology Architecture (VistA)

Why VistA?

- State-of-the-art EHR that has transformed healthcare in the Veteran's Health Administration (VHA) (Perlin, 2006; Byrne, 2010)
- Not that pretty, but has all of the modern features of the EHR, e.g., clinical decision support (CDS), computerized provider order entry (CPOE), etc.
- Distributed under open-source model, unlike most other vendors who do not even allow screen shots to be shown outside their customers' institutions

Fascinating story (Allen, 2017), but VistA [now being phased out in favor of Cerner EHR](#) adopted by Department of Defense

Some details about VistA

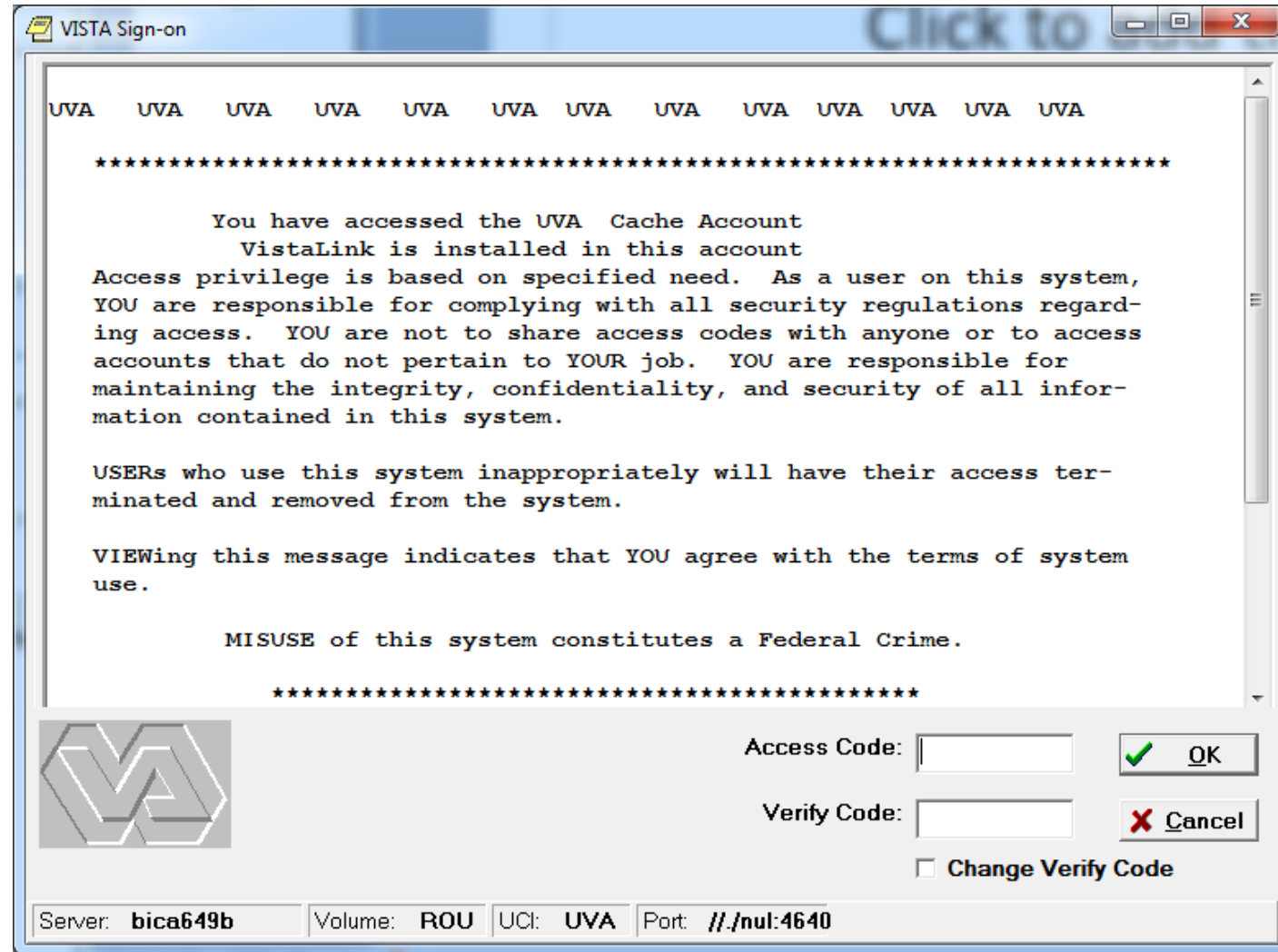
Server written in M (formerly called MUMPS), accessed via command-line interface

- Runs in commercial Intersystems Cache (on many platforms) or open-source GT.M (Linux only)

Client (called CPRS) written in Delphi and provides graphical user interface

- Only runs on Windows (just about all versions)

Logging on to CPRS, the front end to VistA



VISTA Sign-on

UVA UVA UVA UVA UVA UVA UVA UVA UVA UVA UVA UVA UVA

You have accessed the UVA Cache Account
VistaLink is installed in this account
Access privilege is based on specified need. As a user on this system,
YOU are responsible for complying with all security regulations regard-
ing access. YOU are not to share access codes with anyone or to access
accounts that do not pertain to YOUR job. YOU are responsible for
maintaining the integrity, confidentiality, and security of all infor-
mation contained in this system.

USERS who use this system inappropriately will have their access ter-
minated and removed from the system.

VIEWing this message indicates that YOU agree with the terms of system
use.

MISUSE of this system constitutes a Federal Crime.



Access Code:

Verify Code:

☐ Change Verify Code

Server: bica649b Volume: ROU UCI: UVA Port: //./nul:4640

Choosing a patient

Patient Selection

Patient List

☐ No Default
☐ Providers
☐ Team/Personal
☐ Specialties

☐ Clinics
☐ Wards
☒ All

Patients (All Patients)

Seven, Inpatient

Eight, Inpatient
Eight, Outpatient
Eight, Patient
Eighteen, Inpatient
Eighteen, Outpatient
Eighteen, Patient
Eighty, Inpatient
Eighty, Outpatient

OK
Cancel

Save Patient List Settings

Notifications

Info	Patient	Location	Urgency	Alert Date/Time	Message
	ONE, PATIE (O0001)	GM	Moderate	09/07/2010@08:13	New order(s) placed.
	EIGHTY, OU (E0680)		Moderate	08/30/2010@10:07	Discontinued Consult WHC
	EIGHTY, OU (E0680)		Moderate	08/30/2010@10:07	New consult PSYCH (Today)
	SEVEN, INP (S0807)	3E NO...	Moderate	08/30/2010@07:44	Abnormal labs - [TSH, T-3 RU]
	SEVEN, INP (S0807)	3E NO...	Moderate	08/30/2010@07:44	Abnormal labs - [TSH, T-3 RU]

Process Info Process All Process Forward Show Comments Remove

Cover sheet – overview

Vista CPRS in use by: Doctor,One (BROKERSERVER)

File Edit View Tools Help

SEVEN,INPATIENT 666-00-0807 Mar 09,1945 (65)	3E S 3E-100-4 Provider: DOCTOR,ONE	Primary Care Team Unassigned Attending: Doctor,Two	Flag	VistaWeb Remote Data	Postings A
--	--	---	------	-------------------------	---------------

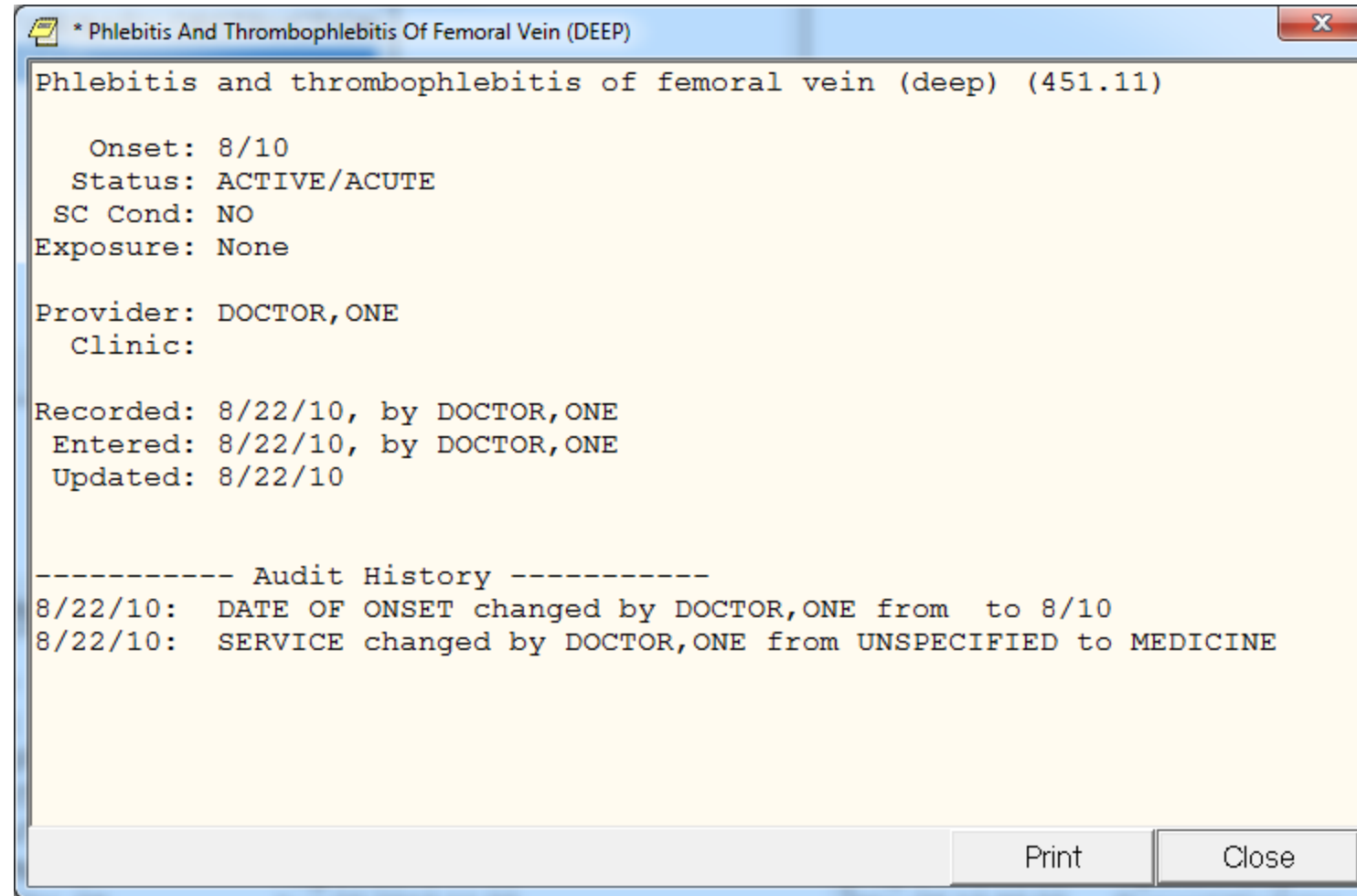
Active Problems Depression *Tachycardia Hypertrophy (BENIGN) OF PROSTATE WITHOUT URINARY OBSTRUCTION *Phlebitis And Thrombophlebitis Of Femoral Vein (DEEP) Graves' Disease	Allergies / Adverse Reactions Pet Hair Keflex	Postings Allergies
---	--	------------------------------

Active Medications No Active Medications Found	Clinical Reminders Depression Screening PC Nutritional Screening Influenza Vaccine Pneumococcal vaccine (Pneumovax)	Due Date Dec 07,08 DUE NOW DUE NOW DUE NOW
--	--	---

Recent Lab Results No Orders Found.	Vitals T 98.6 F Aug 20,2010 11:30 (37.0 C) P 68 Aug 20,2010 11:30 R 24 Aug 20,2010 11:30 BP 194/88 Aug 20,2010 11:30 HT 70 in Aug 20,2010 11:30 (177.8 cm) WT 199 lb Aug 20,2010 11:30 (90.3 kg) PN 0 Aug 20,2010 11:30 POX 98 Aug 20,2010 11:30 BMI 28.61 Aug 20,2010 11:30	Appointments/Visits/Admissions Aug 03,10 09:00 Endocrine Inpatient Appointment Jul 23,10 08:00 Inpatient Stay 3e North Jul 15,10 13:00 General Medicine Action Required Jul 01,10 14:00 General Medicine Action Required Jun 20,10 13:00 General Medicine Action Required Jun 10,10 10:00 General Medicine Action Required May 24,10 13:00 Inpatient Stay 3e North May 20,10 08:00 General Medicine Action Required May 18,10 08:00 General Medicine Action Required May 10,10 15:00 General Medicine Action Required
---	--	--

Cover Sheet Problems Meds Orders Notes Consults Surgery D/C Summ Labs Reports

Drilling down to details of a problem



* Phlebitis And Thrombophlebitis Of Femoral Vein (DEEP)

Phlebitis and thrombophlebitis of femoral vein (deep) (451.11)

Onset: 8/10
Status: ACTIVE/ACUTE
SC Cond: NO
Exposure: None

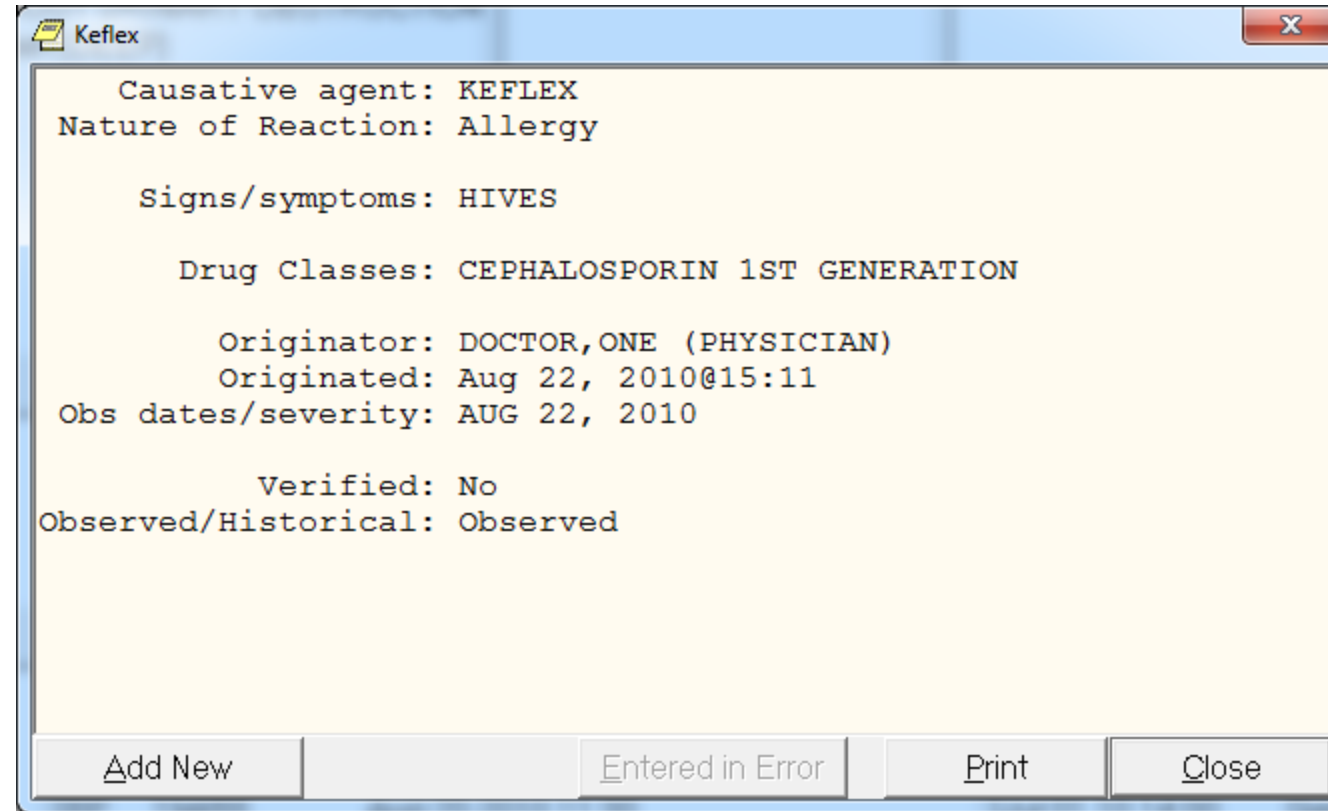
Provider: DOCTOR, ONE
Clinic:

Recorded: 8/22/10, by DOCTOR, ONE
Entered: 8/22/10, by DOCTOR, ONE
Updated: 8/22/10

----- Audit History -----
8/22/10: DATE OF ONSET changed by DOCTOR, ONE from to 8/10
8/22/10: SERVICE changed by DOCTOR, ONE from UNSPECIFIED to MEDICINE

Print Close

Details of an allergy



A screenshot of a software window titled "Keflex" with a standard Windows-style title bar (blue background, minimize, maximize, and close buttons). The window contains a text area with the following information:

Causative agent: KEFLEX
Nature of Reaction: Allergy

Signs/symptoms: HIVES

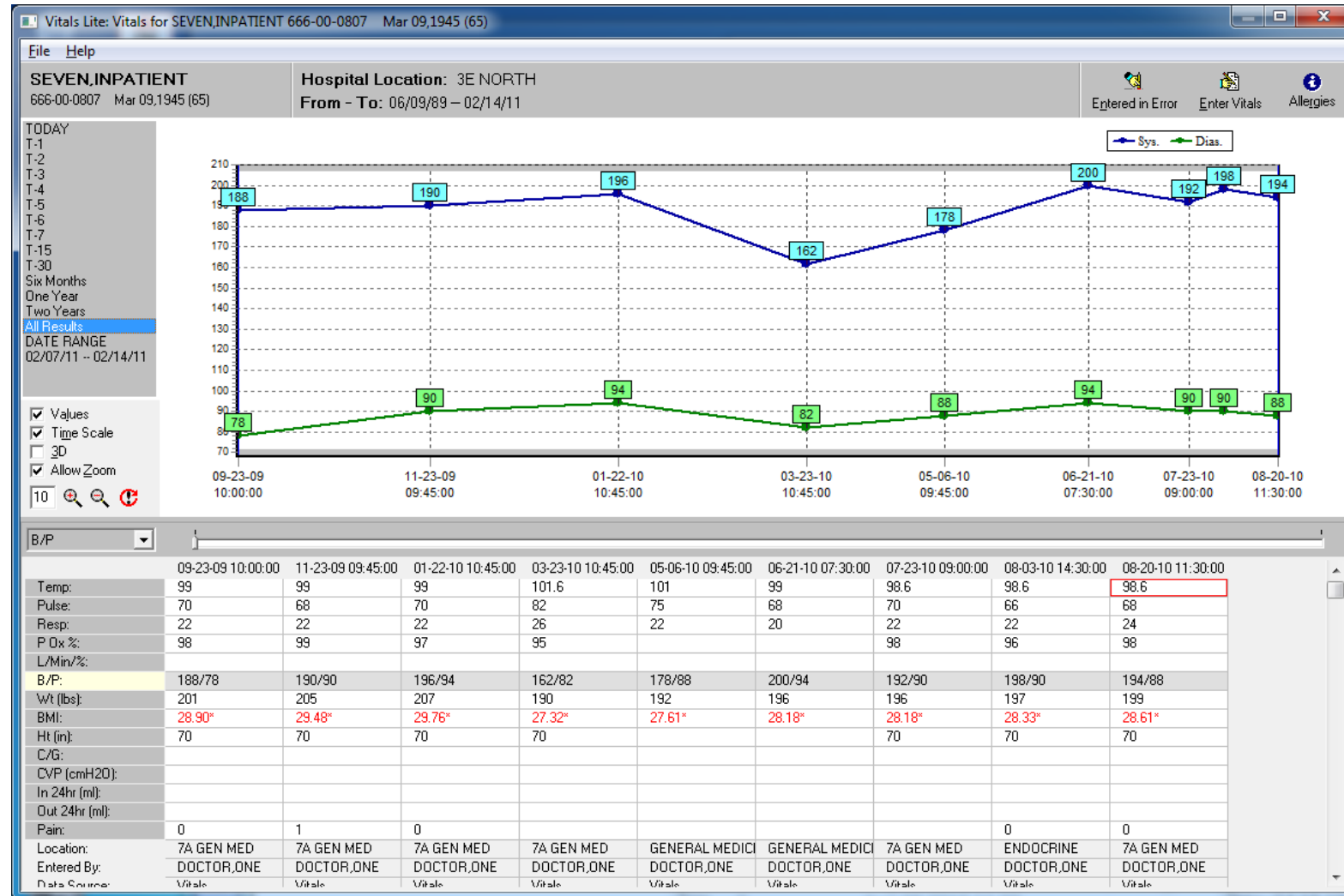
Drug Classes: CEPHALOSPORIN 1ST GENERATION

Originator: DOCTOR, ONE (PHYSICIAN)
Originated: Aug 22, 2010@15:11
Obs dates/severity: AUG 22, 2010

Verified: No
Observed/Historical: Observed

At the bottom of the window, there are four buttons: "Add New", "Entered in Error", "Print", and "Close".

Viewing vital signs over time



More details on problems

Vista CPRS in use by: Doctor,One (BROKERSERVER)

File Edit View Action Tools Help

SEVEN,INPATIENT 3E S 3E-100-4 Primary Care Team Unassigned
666-00-0807 Mar 09,1945 (65) Provider: DOCTOR,ONE Attending: Doctor,Two

Flag VistaWeb Postings
Remote Data A

View options: Active, Inactive, Both active and inactive, Removed

New problem

Active Problems (5 of 5)

St...	Description	Onset ...	Last U...	Provider	Service
A	Depression	2009	Sep 02 21	Doctor,One	
A *	Tachycardia Patient presents with tachycardia and Graves ophthalmopathy	Aug 02 21	Aug 29 21	Doctor,One	Medical
A	Graves' Disease Patient requires dietary counseling to reduce iodine intake.	2005	Aug 24 21	Doctor,One	Medicine
A *	Phlebitis and thrombophlebitis of femoral vein (deep)	Aug 2011	Aug 22 21	Doctor,One	Medicine
A	Hypertrophy (Benign) of Prostate without Urinary obstruction	2009	Aug 22 21	Doctor,One	Medicine

Cover Sheet Problems Meds Orders Notes Consults Surgery D/C Summ Labs Reports

List of active orders

Vista CPRS in use by: Doctor,One (BROKERSERVER)

File Edit View Action Options Tools Help

SEVEN,INPATIENT 3E S 3E-100-4 Primary Care Team Unassigned
666-00-0807 Mar 09,1945 (65) Provider: DOCTOR,ONE Attending: Doctor,Two

Flag VistaWeb Postings
Remote Data A

View Orders Active Orders (includes Pending & Recent Activity) - ALL SERVICES

Active Orders (includes Pending)

Service	Order	Start / Stop	Provider	Nurse	Clerk	Chart
Diet	REGULAR Diet	Start: 08/23/10	Clinical Coordinator,O			
Lab	TSH BLOOD SERUM SP LB #17674	Start: 06/10/10 11:00	Doctor,O			
	T-3 RU BLOOD SERUM SP LB #17674	Start: 06/10/10 11:00	Doctor,O			
	T-4 BLOOD SERUM SP LB #17674	Start: 06/10/10 11:00	Doctor,O			
	FREE T-4 BLOOD SERUM SP LB #17674	Start: 06/10/10 11:00	Doctor,O			
	TSH BLOOD SERUM SP LB #17672	Start: 05/24/10 11:00	Doctor,O			
	T-3 RU BLOOD SERUM SP LB #17672	Start: 05/24/10 11:00	Doctor,O			
	T-4 BLOOD SERUM SP LB #17672	Start: 05/24/10 11:00	Doctor,O			
	FREE T-4 BLOOD SERUM SP LB #17672	Start: 05/24/10 11:00	Doctor,O			
	TSH BLOOD SERUM SP LB #17670	Start: 08/03/10 11:00	Doctor,O			
	T-3 RU BLOOD SERUM SP LB #17670	Start: 08/03/10 11:00	Doctor,O			
	T4, FREE & TOTAL BLOOD SERUM SP LB #17670	Start: 08/03/10 11:00	Doctor,O			

Write Delayed Orders

Write Orders

- Diet Order
- Vital Signs
- Inpatient Medications
- Outpatient Medications
- Infusion
- Non VA Meds
- Metoprolol Tartrate 50MG
- Aspirin 81 MG Non VA
- Laboratory
- Inpt Labs Routine Menu...
- Imaging
- Consult
- Diabetic Nutrition Consult
- Clinician Add Order Menu...
- NPO/Dressing Change

Cover Sheet Problems Meds Orders Notes Consults Surgery D/C Summ Labs Reports

Viewing the patient's notes

Vista CPRS in use by: Doctor,One (BROKERSERVER)

File Edit View Action Options Tools Help

SEVEN,INPATIENT	3E S 3E-100-4	Primary Care Team Unassigned	Flag	VistaWeb	Postings
666-00-0807	Mar 09,1945 (65)	Provider: DOCTOR,ONE	Attending: Doctor,Two	Remote Data	A

Last 100 Signed Notes

[-] All signed notes

- [-] Aug 23,10 SCI GENERAL NOTE, 3E NORTH, ONE DOCTOR
- [-] Aug 22,10 Adverse React/Allergy, 7A GEN MED, ONE DOCTOR
- [-] Aug 03,10 OPHTHALMOLOGIST CONSULT NOTE, GENERAL MEDICINE, ONE DOCTOR

Adm: 07/23/10 SCI GENERAL NOTE, 3E NORTH, ONE DOCTOR (Aug 23,10@20:17)

LOCAL TITLE: SCI GENERAL NOTE
DATE OF NOTE: AUG 23, 2010@20:17 ENTRY DATE: AUG 23, 2010@20:19
AUTHOR: DOCTOR,ONE EXP COSIGNER:
URGENCY: STATUS: COMPLETED

REASON FOR VISIT/CHIEF COMPLAINT:
Evaluation and management of chronic problem(s)

Weight gain

INTERVAL HISTORY:
weight gain

PHYSICAL EXAMINATION:
Temperature: 98.6 F [37.0 C] (08/20/2010 11:30)
Pulse: 68 (08/20/2010 11:30)
Respiration: 24 (08/20/2010 11:30)
BP: 194/88 (08/20/2010 11:30)
Pain: 0 (08/20/2010 11:30)
Height: 70 in [177.8 cm] (08/20/2010 11:30)
Weight: 199 lb [90.5 kg] (08/20/2010 11:30)

INTERVAL LABS:

ASSESSMENT & PLAN:
Diet Modification

/es/ ONE DOCTOR

Signed: 08/23/2010 20:22

Templates
New Note

Cover Sheet Problems Meds Orders Notes Consults Surgery D/C Summ Labs Reports

Writing a new note

Vista CPRS in use by: Doctor,One (BROKERSERVER)

File Edit View Action Options Tools Help

SEVEN,INPATIENT	3E S 3E-100-4	Primary Care Team Unassigned	Flag	VistaWeb	Postings
666-00-0807	Mar 09,1945 (65)	Provider: DOCTOR,ONE	Attending: Doctor,Two	Remote Data	A

Last 100 Signed Notes

- New Note in Progress
- Feb 14,11 ADMISSION EVAL/ASSESSMENT , 3E NORTH, Do
- All signed notes
 - Aug 23,10 SCI GENERAL NOTE, 3E NORTH, ONE DOCTOR
 - Aug 22,10 Adverse React/Allergy, 7A GEN MED, ONE DOCTOR
 - Aug 03,10 OPTHALMOLOGIST CONSULT NOTE, GENERAL

ADMISSION EVAL/ASSESSMENT Feb 14,2011@07:09 Doctor,One Change...

Adm: 07/23/10 3E NORTH

81 y o man with DM, Neuropathy, hypertension, non-ulcer dyspepsia, here for F/U. On last visit, AAA was suspected on exam, but has been RULED OUT by abd sono.

Reports he continue to have nausea when first gets up in AM, has difficulty swallowing food. (Prior EGD 8-02 was grossly nl, but bx showed H. pylori). Also gets bloating sx p-prandially. Cimetidine not helpful. Has changed his diet some. Reports sx all started after an episode of "stomch flu" which never fully resolved. Got better until last episode of "food Poisoning".

Home glucoses 120 - 150.
BP 160/84 L arm, seated, reg cuff
Lungs: clear
Heart: reg rhythm, nl s1s2, II/VI SEM apex
Abd: nl BS, soft, non-tender, no masses/megaly
Exts: no edema A: GI sx are predominant complaint.

EGD sched for 06-10-03. F/U 1 week after EGD, with Chem Profile and A1C before visit.

<No encounter information entered>

/ Templates
/ Reminders
Encounter

Cover Sheet Problems Meds Orders Notes Consults Surgery D/C Summ Labs Reports

Viewing labs

Vista CPRS in use by: Doctor,One (BROKERSERVER)

File Edit View Tools Help

SEVEN,INPATIENT 3E S 3E-100-4 Primary Care Team Unassigned
666-00-0807 Mar 09,1945 (65) Provider: DOCTOR,ONE Attending: Doctor,Two

Flag VistaWeb Postings
Remote Data A

Lab Results

- Most Recent
- Cumulative
- All Tests by Date
- Selected Tests by Date
- Worksheet
- Graph
- Microbiology
- Anatomic Pathology - All Reports
- Blood Bank

Headings

- Cbc Profile
- Chem Profile
- Ria-(serum)
- Cell Count (csf)
- Urinalysis
- Miscellaneous Tests

Date Range

- Date Range...
- Today
- One Week
- Two Weeks
- One Month
- Six Months
- One Year
- Two Years
- All Results

Cumulative [From: EARLIEST RESULT to Feb 14,2011]

---- CBC PROFILE ----

BLOOD	08/23 2010 15:00	08/23 2010 13:00	08/23 2010 13:00	08/23 2010 13:00	08/23 2010 09:00	Reference Units Ranges
WBC	15.0 H					k/cmm 3.5 - 8.3
RBC	4.50 L					M/cmm 4.7 - 6.1
HGB	14.3				14.3	g/dL 14 - 18
HCT	41 L			41 L		% 42 - 52
MCV	88.0		88.0			cmu 80 - 94
MCH	31	31				uug 27 - 35
MCHC	31 L					gm/dL 33 - 36
RDW	14					% 11 - 14
PLT	145					K/cmm 140 - 420
LYMPH %						
Comments:		a				
a. Correction						
						MCH reported incorrectly as 88 by [10000000086-VA500].
						Changed to 31 on Aug 24, 2010@17:05 by [10000000086-VA500].
						MCH flagged incorrectly as H* by [10000000086-VA500].
						Changed to normal on Aug 24, 2010@17:05 by [10000000086-VA500].

---- CHEM PROFILE ----

SERUM	08/23 2010 11:00	08/23 2010 11:00	08/23 2010 10:00	08/23 2010 09:00	08/23 2010 09:00	Reference Units Ranges
-------	------------------------	------------------------	------------------------	------------------------	------------------------	---------------------------

KEY: "L" = Abnormal Low, "H" = Abnormal High, "*" = Critical Value

Cover Sheet Problems Meds Orders Notes Consults Surgery D/C Summ Labs Reports

Including critical values

Vista CPRS in use by: Doctor,One (BROKERSERVER)

File Edit View Tools Help

SEVEN, INPATIENT 3E S 3E-100-4 Primary Care Team Unassigned
666-00-0807 Mar 09, 1945 (65) Provider: DOCTOR, ONE Attending: Doctor, Two

Flag VistaWeb ? Postings
Remote Data A

Lab Results

- Most Recent
- Cumulative
- All Tests by Date
- Selected Tests by Date
- Worksheet
- Graph
- Microbiology
- Anatomic Pathology - All Reports
- Blood Bank

Most Recent

Oldest Previous Collected Next Newest
<< < Aug 23, 2010 15:00 > >>

Most Recent Lab Result

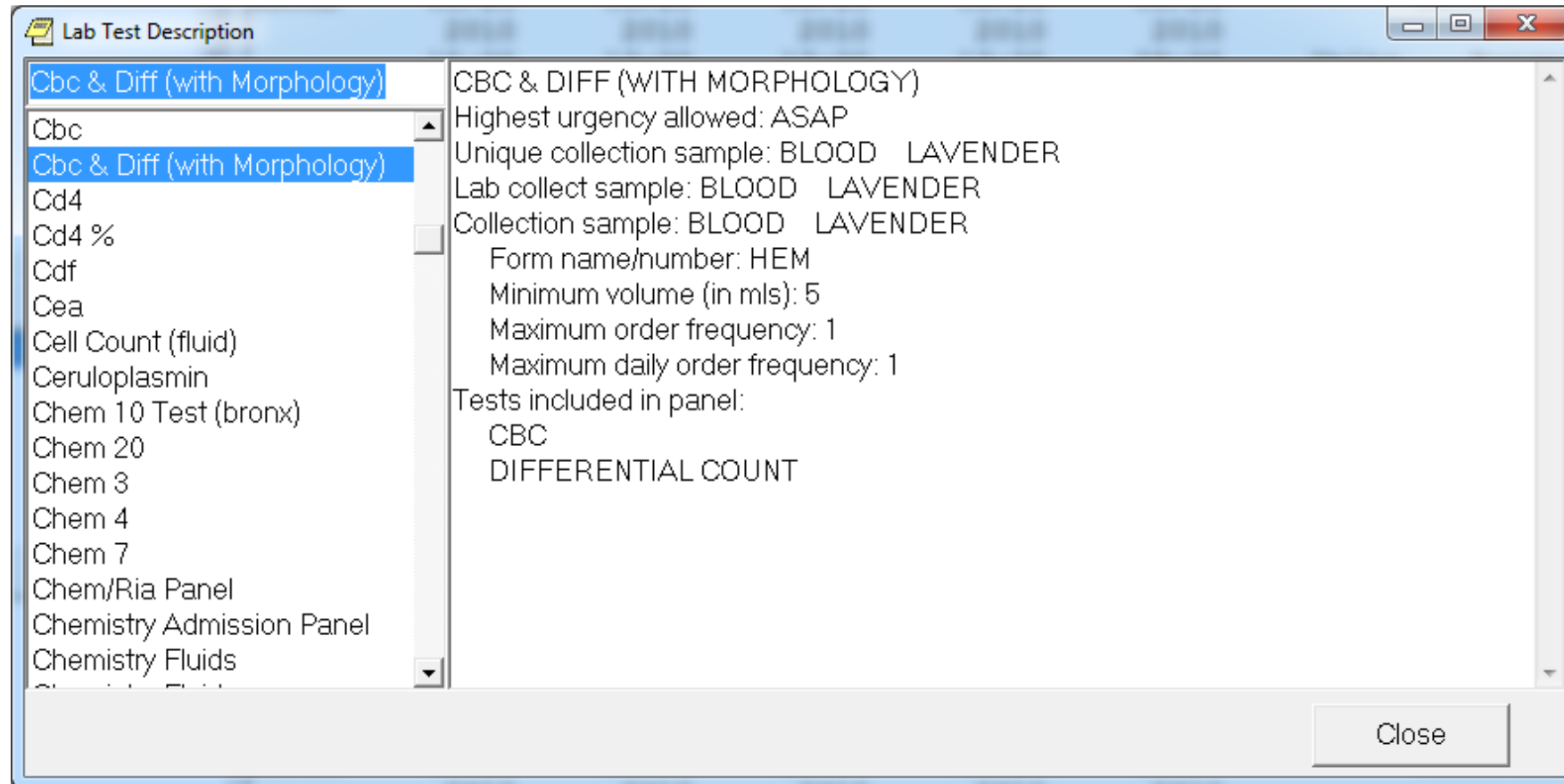
Test	Result	Flag	Units	Ref Range
GLUCOSE	310	H*	MG/DL	84 - 128
UREA NITROGEN	14			
SODIUM	145			
CHLORIDE	89			
CO2	30			
CREATININE	1.0			
POTASSIUM	7.5			
CALCIUM	10.00			

Specimen: BLOOD; Accession: CH 0825 3; Provider: DOCTOR, ONE
Report Released Date/Time: Aug 25, 2010@10:53
Performing Lab: ALBANY VA MEDICAL CENTER VA MEDICAL CENTER ALBANY, NY 12180-0097

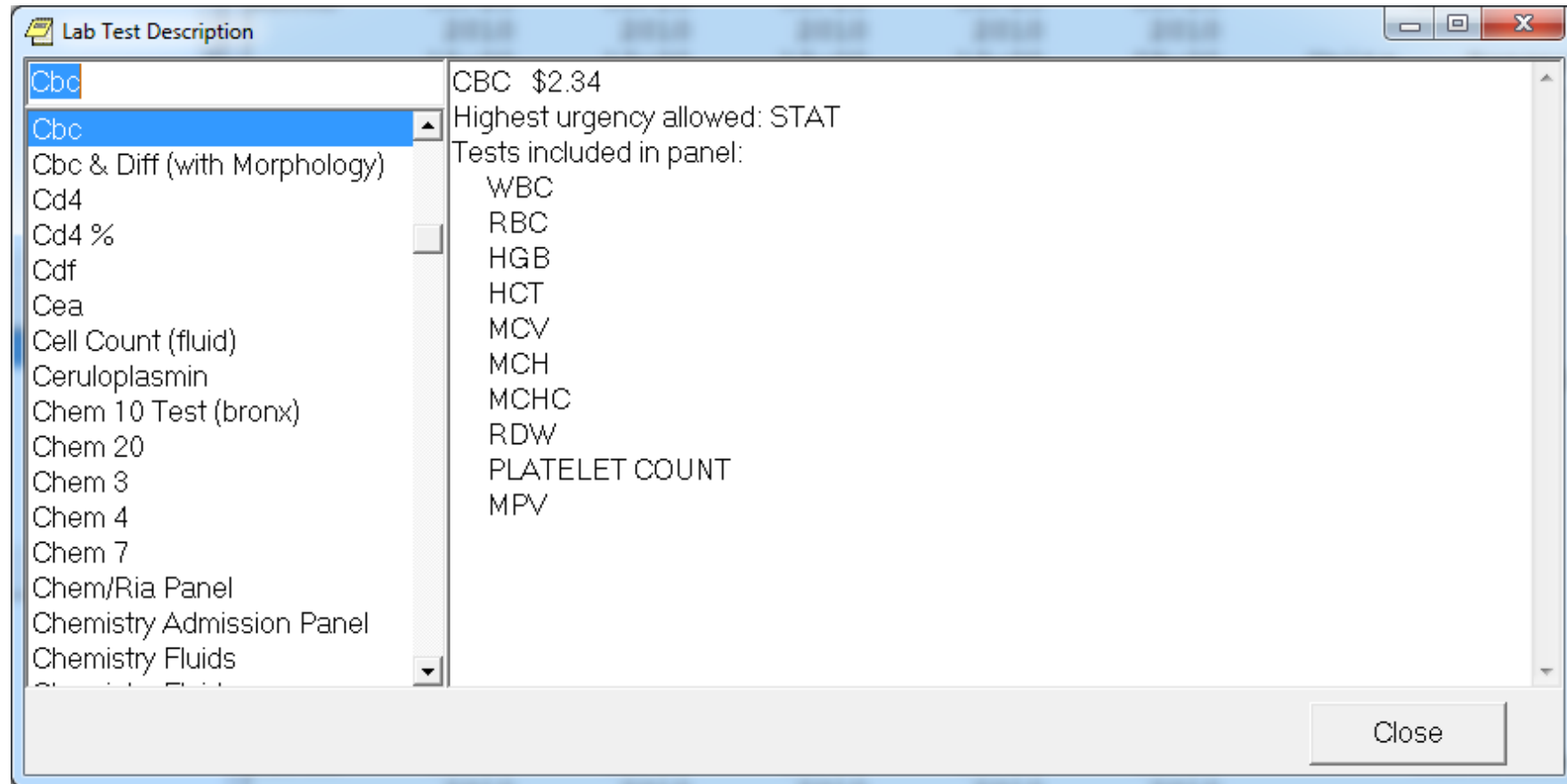
KEY: "L" = Abnormal Low, "H" = Abnormal High, "*" = Critical Value

Cover Sheet Problems Meds Orders Notes Consults Surgery D/C Summ Labs Reports

More information on lab tests



Including (for some) cost



Another patient

Vista CPRS in use by: Doctor,One (BROKERSERVER)

File Edit View Tools Help

EIGHT.PATIENT Visit Not Selected Primary Care Team Unassigned
666-00-0008 Apr 07,1935 (75) Provider: DOCTOR,ONE

Flag VistaWeb Postings
Remote Data CAD

Active Problems	Allergies / Adverse Reactions	Postings
Headache Hypertension Hyperlipidemia Acute Myocardial Infarction, Unspecified Site, Episode Of Care Unspecified Chronic Systolic Heart Failure Diabetes Mellitus Type II Or Unspecified	Penicillin Chocolate	Allergies Crisis Note May 21,2000 Advance Directive Completed May 16,2007 Advance Directive Oct 18,2000 Advance Directive Oct 18,2000

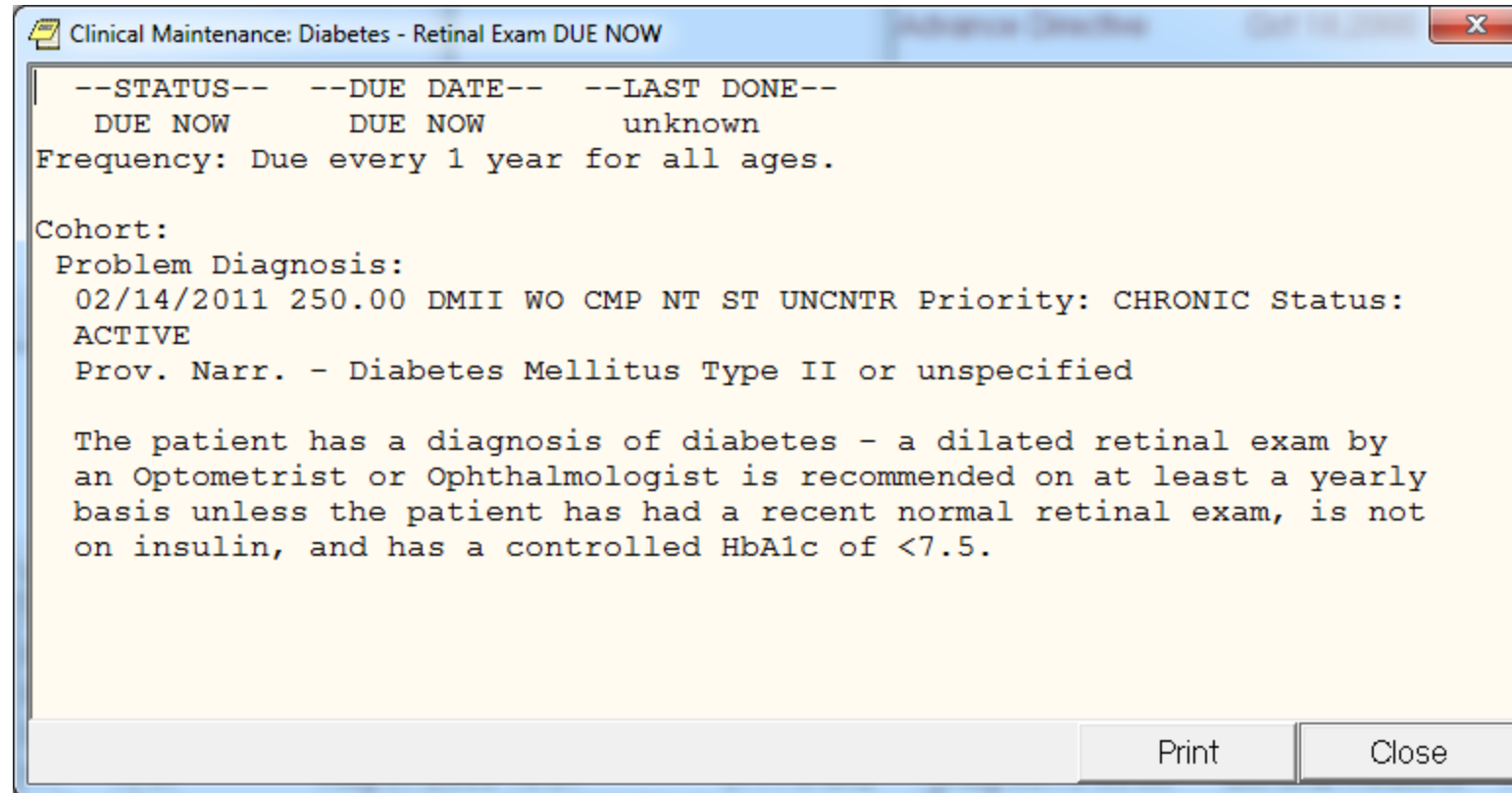
Active Medications	Clinical Reminders	Due Date
Metoprolol Tartrate 50mg Tab Active Simvastatin 40mg Tab Active Non-VA Aspirin 81mg Ec Tab Active	Depression Screening PC Nutritional Screening Diabetes - Urinalysis Influenza Vaccine Pneumococcal vaccine (Pneumovax)	DUE NOW DUE NOW DUE NOW DUE NOW DUE NOW

Recent Lab Results	Vitals	Appointments/Visits/Admissions
No Orders Found.	T 98.5 F Mar 05,2010 09:00 (36.9 C) P 74 Mar 05,2010 09:00 R 22 Aug 31,2009 10:00 BP 134/81 Mar 05,2010 09:00 HT 70 in Aug 31,2009 10:01 (177.8 cm) WT 178 lb Mar 05,2010 09:00 (80.7 kg) PN 1 Mar 05,2010 09:00 POX 98 Dec 01,2009 08:53 BMI 25.59 Mar 05,2010 09:00	Aug 26,10 21:19 Cardiology Action Required Aug 12,10 08:00 General Medicine Action Required Aug 11,10 08:00 General Medicine Action Required Aug 10,10 08:00 General Medicine Action Required Aug 09,10 08:00 General Medicine Action Required

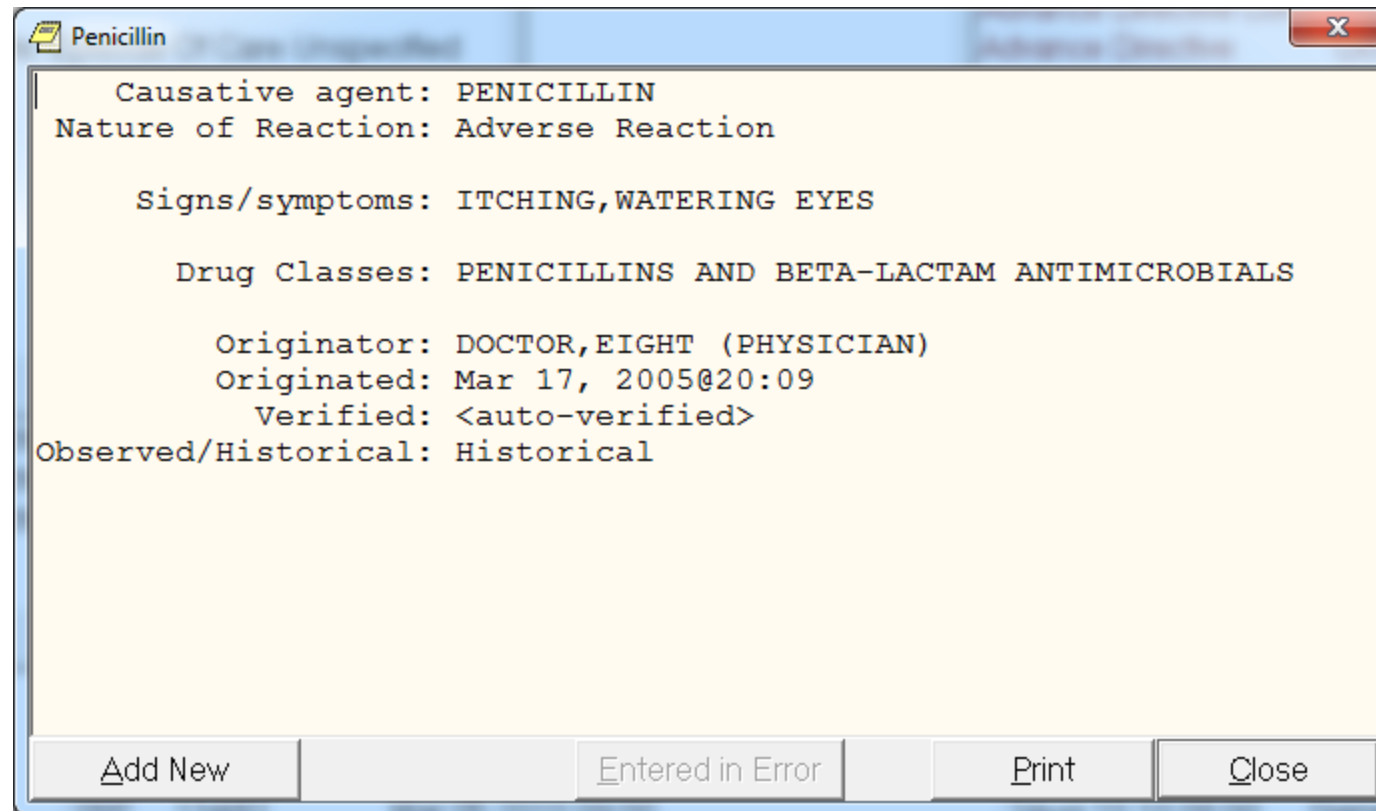
Cover Sheet Problems Meds Orders Notes Consults Surgery D/C Summ Labs Reports



Clinical decision support: reminders



Clinical decision support uses allergy information



A screenshot of a software window titled "Penicillin" with a standard Windows-style title bar (minimize, maximize, close buttons). The window contains a text area with the following information:

Causative agent: PENICILLIN
Nature of Reaction: Adverse Reaction

Signs/symptoms: ITCHING, WATERING EYES

Drug Classes: PENICILLINS AND BETA-LACTAM ANTIMICROBIALS

Originator: DOCTOR, EIGHT (PHYSICIAN)
Originated: Mar 17, 2005@20:09
Verified: <auto-verified>
Observed/Historical: Historical

At the bottom of the window, there is a row of five buttons: "Add New", "Entered in Error", "Print", and "Close". The "Entered in Error" button is currently disabled (grayed out).

Let's try to prescribe a medication

Vista CPRS in use by: Doctor,One (BROKERSERVER)

File Edit View Action Tools Help

EIGHT.PATIENT Visit Not Selected Primary Care Team Unassigned Flag VistaWeb Postings
666-00-0008 Apr 07,1935 (75) Provider: DOCTOR.ONE Remote Data CAD

Sort by Status/Exp. Date (IMO first on Inpt)

Action	Outpatient Medications	Expires	Status	Last Filled
	METOPROLOL TARTRATE 50MG TAB Qty: 180 for 90 days Sig: TAKE ONE TABLET BY MOUTH TWICE A DAY	02/28/11	Active	Feb 27,10
	SIMVASTATIN 40MG TAB Qty: 90 for 90 days Sig: TAKE ONE TABLET BY MOUTH EVERY EVENING	02/28/11	Active	Feb 27,10

Action	Non-VA Medications	Start Date	Status
	Non-VA ASPIRIN 81MG EC TAB 81MG MOUTH EVERY MORNING Non-VA medication recommended by VA provider.		Active

Action	Inpatient Medications	Stop Date	Status	Location
--------	-----------------------	-----------	--------	----------

Cover Sheet Problems Meds Orders Notes Consults Surgery D/C Summ Labs Reports

How about some amoxicillin?

Medication Order

AMOXICILLIN CAP,ORAL Change

Dosage	Complex	Schedule
500MG	ORAL (BY MOUTH)	Q8H ☐ PRN
250MG	ORAL (BY MOUTH)	Q8H
500MG		Q8H*
1000MG		QAM
1500MG		QAMINSULIN
2000MG		QDAY

Comments:

Days Supply: 30 Pick Up: ☐ Clinic ☐ Mail ☒ Window Priority: ROUTINE

AMOXICILLIN CAP,ORAL 500MG
TAKE 1 CAPSULE BY MOUTH EVERY 8 HOURS
Quantity: 90 Refills: 0 Accept Order Quit

Oops, patient is allergic

Order Checking

Remote Order Checking not available - checks done on local data only

Previous adverse reaction to: (INACTIVE) PENICILLINS: (LOCAL)

Accept Order

Cancel Order

Maybe erythromycin?

Medication Order

ERYTHROCIN <ERYTHROMYCIN TAB > Change

Dosage	Complex	Schedule
250MG	ORAL (BY MOUTH)	BID ☐ PRN
250MG	ORAL (BY MOUTH)	5XD
250MG		AT ONSET
500MG		BID
500MG		BID AC
1000MG		CONTINUOUS DRIP

Comments:

Days Supply: 30

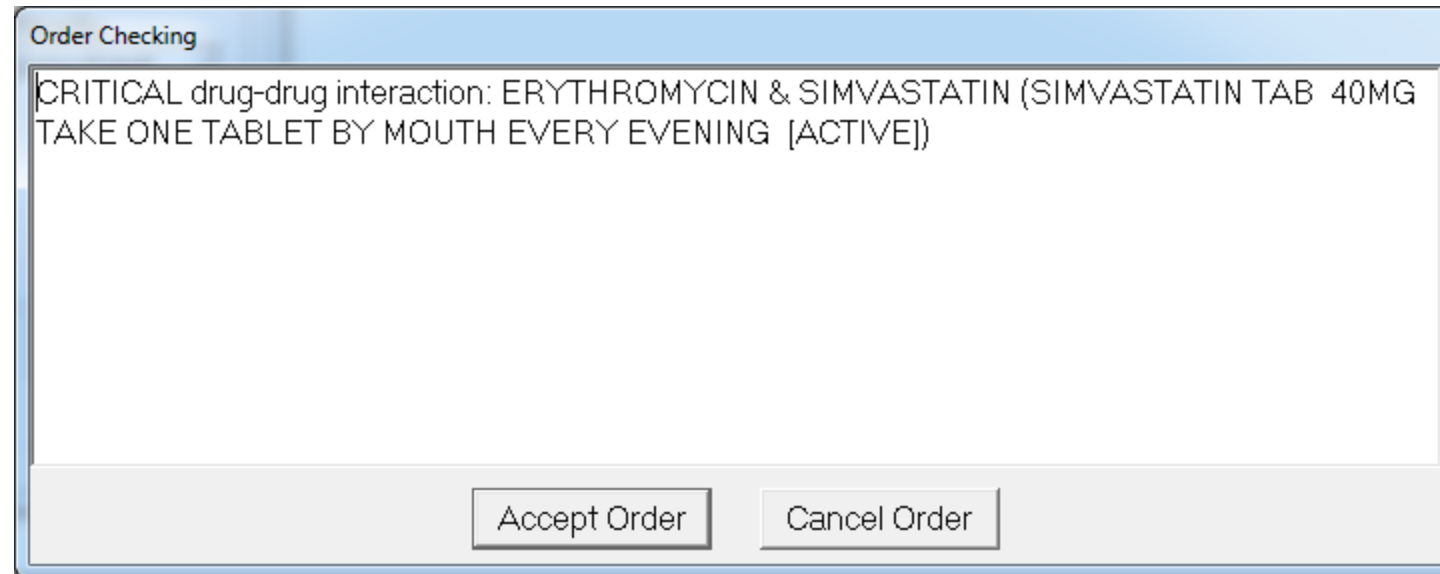
Pick Up: ☐ Clinic ☐ Mail ☒ Window

Priority: ROUTINE

ERYTHROMYCIN TAB 250MG
TAKE ONE TABLET BY MOUTH TWICE A DAY
Quantity: 60 Refills: 0

Accept Order Quit

No, interacts with statin drugs



Another patient – drug interactions

Vista CPRS in use by: Doctor,One (BROKERSERVER)

File Edit View Action Tools Help

ZZZTWO,IMAGEPATIENT Visit Not Selected Primary Care Team Unassigned Flag VistaWeb No Postings
666-06-1002 Apr 15,1953 (57) Provider: DOCTOR,ONE Remote Data

Sort by Status/Exp. Date (IMO first on Inpt)

Action	Outpatient Medications	Expires	Status	Last Filled
	SILDENAFIL CITRATE 50MG TAB Qty: 10 Sig: TAKE ONE TABLET BY MOUTH AS NEEDED		Pending	
	ATORVASTATIN CALCIUM 40MG TAB Qty: 90 Sig: TAKE ONE TABLET BY MOUTH EVERY DAY		Pending	

Action	Non-VA Medications	Start Date	Status
--------	--------------------	------------	--------

Action	Inpatient Medications	Stop Date	Status	Location
--------	-----------------------	-----------	--------	----------

Cover Sheet Problems Meds Orders Notes Consults Surgery D/C Summ Labs Reports

Prescribing nitrates for angina

Medication Order

NITRO-BID <NITROGLYCERIN CAP,SA > Change

Dosage	Complex	Schedule
2.5MG	ORAL (BY MOUTH)	BID ☐ PRN
2.5MG	ORAL (BY MOUTH)	AT ONSET
5MG		BID
6.5MG		BID AC
9MG		CONTINUOUS DRIP
13MG		ENS

Comments:

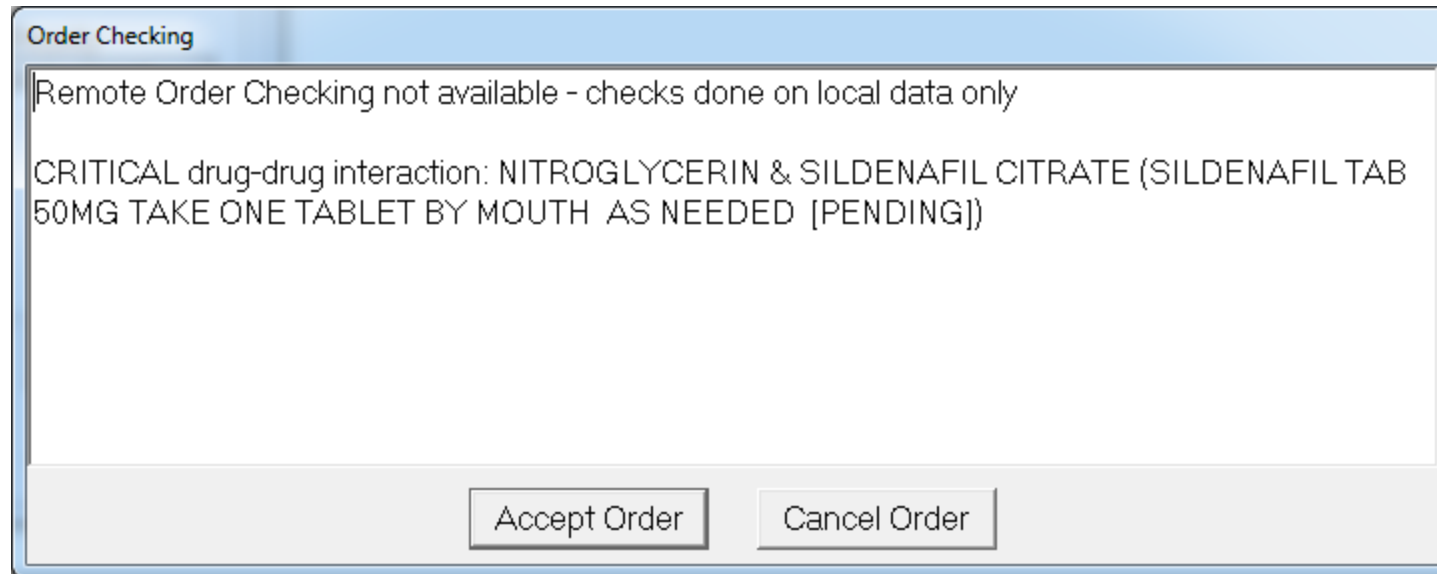
>> Quantity Dispensed: DISP IN MULT OF 100 <<

Days Supply: 90 Pick Up: ☐ Clinic ☐ Mail ☒ Window Priority: ROUTINE

NITROGLYCERIN CAP,SA 2.5MG
TAKE 1 CAPSULE BY MOUTH TWICE A DAY
Quantity: 180 Refills: 0

Accept Order Quit

Oops!



More about VistA

Pure open-source version is also known as FOIA VistA

There are two other streams of VistA activity

- [WorldVistA](#) follows more traditional open-source pathway
- OpenVista more commercially oriented, and some vendors have proprietary extensions from the base code (e.g., [MedSphere](#))

Transitioning to commercial Cerner EHR

- Based on success of transition by [US Department of Defense](#)
- But VA transition has been much more problematic (GAO, 2023)

Other open-source EHRs

Analysis of free and open-source EHR systems (Purkayastha, 2019)

- Many downloads but tiny operational usage

Only two currently have ASTP/ONC certification

- [OpenEMR](#)
- [WorldVista](#)

More use of other noteworthy systems

- Indian Health Service [Resource and Patient Management System \(RPMS\)](#) – derived from VistA; future unclear (HIS, 2019; Cullen, 2020)
- [OpenMRS](#)
- [OpenEHR](#)
- [LibreHealth](#)

EHR vendors leading \$30B marketplace (Smith, 2025)

Hospital

Epic: 37.7%
Oracle Health (Cerner): 21.7%
Meditech: 13.2%
Evident (CPSI): 9.0%
Altera Digital Health: 3.4%
Medhost: 3.3%
WellSky: 2.6%
Vista: 2.3%
Netsmart Technologies: 2.1%
Other: 1.3%

Ambulatory

Epic: 43.9%
Oracle Health (Cerner): 25.1%
Meditech: 13.0%
TruBridge: 6.3%
Veradigm Inc (Allscripts): 3.6%
Athenahealth: 2.0%
Medhost: 1.4%
Netsmart Technologies: 1.3%
Vista: 0.77%
WellSky: 0.74%

EHR market leader is Epic

Dominance by the numbers (Bruce, 2024)

- 305M patients have an Epic record
- Controls 52% of acute multispecialty hospital beds
- Only EHR growing in market share
- Used by all 18 health systems on *U.S. News & World Report's* Best Hospitals 2024-25 Honor Roll

Not monopoly by classic definitions but dominates high end of market, i.e., large academic and other centers (Joseph, 2024)

Privately held company founded over 40 years ago by current CEO Judy Faulkner (Jennings, 2021; Keeler, 2024; Bruce, 2024)

- Story of origins in 4-hour (!) [podcast](#)
- Lynchpin of Madison, WI economy (Eisen, 2020)

Successes and concerns for Epic

Successes

Focuses on integration – hospital and ambulatory, revenue cycle and billing, etc., especially in large medical centers (Bruce, 2023)

Touts itself as “healthcare company,” different from technology companies (Perna, 2023)

Expanding to consumer health (Joseph, 2024)

Concerns

Should Epic control “levers of innovation” in healthcare (Joseph, 2024)

Questionable business practices lock out allow control and stifle competition in EHR marketplace (Joseph, 2024)

Succession planning for CEO and company (Bruce, 2024)

Future of EHR marketplace

Epic as the “operating system” of healthcare (Keeler, 2024; Russell, 2025)?

Early research-oriented “home grown” EHR systems have given way to commercial systems; will Epic be equivalent to Microsoft Windows (Hersh, 2017)?

Or will Oracle with deep pockets make run with de novo AI platform (Capoot, 2024)?