Veterans Health Administration Enterprise Terminology Project & Mapping issues

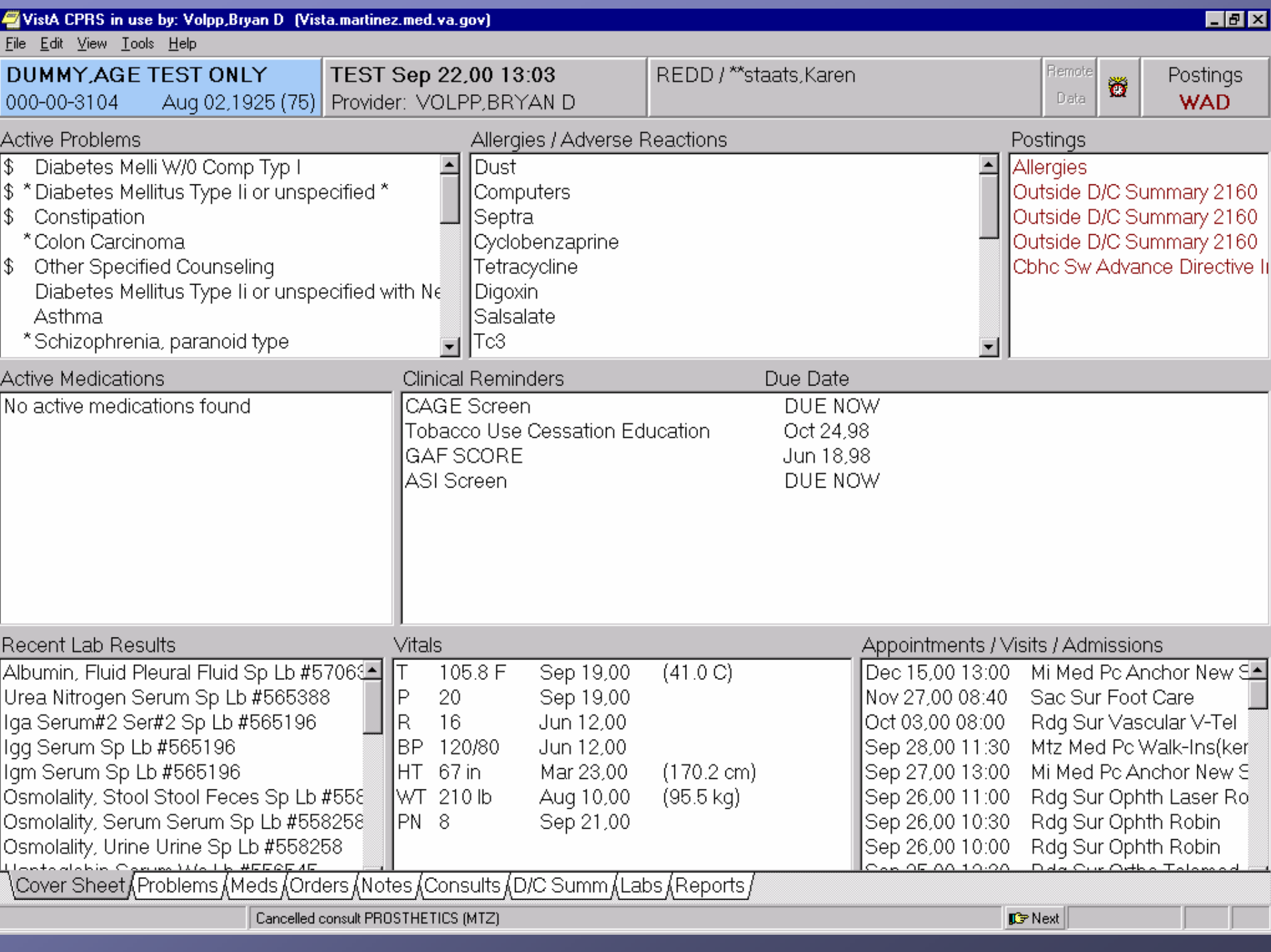
Prepared for AHIMA

by Michael J. Lincoln MD,
VHA Chief Terminologist
and the VHA ETS team

October 15, 2005

Brief history of VA computing

- DHCP-Decentralized Hospital Computing Project began in late 1970's
- VistA-Veterans Integrated Services and Technology Architecture, an outgrowth of DHCP in 1990's
- CPRS-Computerized Patient Records System-developed to provide user GUI to VistA
  - Virtually all clinical transactions computer-based: physician orders, all notes, problem list, clinical reminders, etc etc etc
  - Massively disseminated to all 169 VA hospitals, 800+ outpatient clinics, 5.6 million patients, 250,000 providers AND UNIVERSALLY ADOPTED by them


VistA CPRS in use by: Volpp,Bryan D (Vista.martinez.med.va.gov)
File Edit View Tools Help
DUMMY,AGE TEST ONLY
000-00-3104 Aug 02,1925 (75)
TEST Sep 22,00 13:03
Provider: VOLPP,BRYAN D
REDD / **staats,Karen
Remote Data
Postings
WAD
Active Problems
$ Diabetes Melli W/0 Comp Typ I
$ *Diabetes Mellitus Type Ii or unspecified *
$ Constipation
*Colon Carcinoma
$ Other Specified Counseling
Diabetes Mellitus Type Ii or unspecified with Ne
Asthma
*Schizophrenia, paranoid type
Allergies / Adverse Reactions
Dust
Computers
Septra
Cyclobenzaprine
Tetracycline
Digoxin
Salsalate
Tc3
Postings
Allergies
Outside D/C Summary 2160
Outside D/C Summary 2160
Outside D/C Summary 2160
Cbhc Sw Advance Directive I
Active Medications
No active medications found
Clinical Reminders
Due Date
CAGE Screen DUE NOW
Tobacco Use Cessation Education Oct 24,98
GAF SCORE Jun 18,98
ASI Screen DUE NOW
Recent Lab Results
Albumin, Fluid Pleural Fluid Sp Lb #57063
Urea Nitrogen Serum Sp Lb #565388
Iga Serum#2 Ser#2 Sp Lb #565196
Igg Serum Sp Lb #565196
Igm Serum Sp Lb #565196
Osmolality, Stool Stool Feces Sp Lb #558
Osmolality, Serum Serum Sp Lb #558258
Osmolality, Urine Urine Sp Lb #558258
Vitals
T 105.8 F Sep 19,00 (41.0 C)
P 20 Sep 19,00
R 16 Jun 12,00
BP 120/80 Jun 12,00
HT 67 in Mar 23,00 (170.2 cm)
WT 210 lb Aug 10,00 (95.5 kg)
PN 8 Sep 21,00
Appointments / Visits / Admissions
Dec 15,00 13:00 Mi Med Pc Anchor New S
Nov 27,00 08:40 Sac Sur Foot Care
Oct 03,00 08:00 Rdg Sur Vascular V-Tel
Sep 28,00 11:30 Mtz Med Pc Walk-Ins(ker
Sep 27,00 13:00 Mi Med Pc Anchor New S
Sep 26,00 11:00 Rdg Sur Ophth Laser Ro
Sep 26,00 10:30 Rdg Sur Ophth Robin
Sep 26,00 10:00 Rdg Sur Ophth Robin
Cover Sheet
Problems
Meds
Orders
Notes
Consults
D/C Summ
Labs
Reports
Cancelled consult PROSTHETICS (MTZ)
Next

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DUMMY,AGE TEST ONLY	TEST Sep 22,00 13:03	REDD / **staats,Karen	Remote Data	Postings
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View options

Active
Inactive
Both active and inacti
Removed

New problem

Active Problems (26 of 26)

Stat/N	Description	Onset	Last Updated	Location
A (u)	DIABETES MELLI W/0 COMP TYP I		Jul 21 2000	Bob'S Test Clinic
A * (u)	Diabetes Mellitus Type II or unspecified *	2000	May 17 2000	Mtz Anc Rad Special Procedures
A (u)	CONSTIPATION		May 16 2000	Bob'S Test Clinic
A *	Colon Carcinoma smog	1998	Mar 22 2000	Mtz Anc Rad Special Procedures
A (u)	OTHER SPECIFIED COUNSELING		Dec 07 1999	Mtz Anc Tel Care Nursing
A	Diabetes Mellitus Type II or unspecified with Neurological Manifestations	1996	Jul 21 1999	
A	Partoid Gland		Jul 19 1999	Bob'S Test Clinic
A	Sphincter Oddi Dysfun.		Jul 19 1999	Bob'S Test Clinic
A	Cancer, Colon		Jul 19 1999	Bob'S Test Clinic
A *	Schizophrenia, paranoid type di	1998	Jul 19 1999	Oak Med Purple Team Lir
A	Asthma		Jul 19 1999	Oak Med Gold Team Lum
A	HYPERKERATOSIS OF YAWS		Jul 19 1999	Bob'S Test Clinic

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

Cancelled consult PROSTHETICS (MTZ) Next

Start | SmarTerm Office ... | VISN 21 - Micros... | CD Player | Document1 - Mic... | CPRS - Patie... | Microsoft Power... | printkey | 1:32 PM

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File Edit View Action Options Tools Help

DUMMY,AGE TEST ONLY
000-00-3104 Aug 02,1925 (75)

TEST Sep 22,00 13:03
Provider: VOLPP,BRYAN D

REDD / **staats,Karen

Remote Data

Postings
WAD

Order Sheet

Active Orders (includes Pending
Admit...

Write Orders

Enter/Edit Allergies
Clinic Consults
DIETETICS/NUTRITION CONS
Dietetic Orders
Outpatient Medications
Inpatient Medications
Imaging
Labs Today Once
Stat Lab Tests
Laboratory
Consult
Procedure
CRECC ORDER MENU
MARTINEZ OPC CONSULT/RE
MARE ISLAND CONSULT REI
SACRAMENTO (MATHER) OP
REDDING OPC CONSULT/RE

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

Service	Order	Start / Stop	Provider	Nrs	Clk	Chart	Sts
	CHEM-18 SERUM WC LB #198669	Start: 08/27/98 09:18	Love,G				pending
	CHICO URINALYSIS URINE LC LB #198643	Start: 08/27/98 09:04	Love,G				pending
	OAK PT (ON COUMADIN) BLOOD PLASMA SP LB #183748	Start: 07/23/98 14:39	Love,G				active
	OAK PT BLOOD PLASMA SP LB #183750	Start: 07/23/98 14:40	Love,G				active
	OAK PT BLOOD PLASMA SP LB #183751	Start: 07/23/98 14:40	Love,G				active
	SAC CONTAINER/INSTRUCTIONS CONTAINER UNKNOWN WC LB #3586	Start: 01/12/98 09:44	Meadows,I				active
Imaging	CHEST 2 VIEWS PA&LAT BILATERAL EXAM	Start: 08/30/00	Austria,B				pending
	CT HEAD W&WO CONT	Start: 01/21/00	Weinshelbaum,A				pending
	CHEST 2 VIEWS PA&LAT BILATERAL EXAM	Start: 01/21/00	Weinshelbaum,A				pending
Consults	PROSTHETICS (MTZ) Cons Consultant's Choice STAT <CANCELLED BY SERVICE>	Start: 09/22/00 12:33 Stop: 09/22/00 12:46	Austria,B				cancelled
	DIETETICS (MTZ) Cons Consultant's Choice	Start: 09/15/00 13:04	Mccurry,S				pending
	OXYGEN PROSTHETICS (MTZ) Cons Consultant's Choice	Start: 09/14/00 13:28	Vanauken,P				pending
	PRIMARY CARE (MTZ) Cons Consultant's Choice	Start: 09/01/00 13:59	Mccurry,S				pending
	DIETETICS (MTZ) Cons Consultant's Choice	Start: 09/01/00 13:52	Mccurry,S				pending
	TESTING ONLY Cons Consultant's Choice	Start: 09/01/00 13:52	Mccurry,S				pending
	TESTING ONLY Cons Consultant's Choice	Start: 08/08/00 13:30	Austria,B				pending
	TESTING ONLY Cons Consultant's Choice	Start: 08/08/00 13:21	Austria,B				scheduled
	TESTING ONLY Cons Consultant's Choice	Start: 08/08/00 13:16	Millward,R				pending
	TESTING ONLY Cons Consultant's Choice	Start: 08/08/00 13:03	Austria,B				pending
	PHYSICAL THERAPY INPATIENT (SAC) Cons Bedside	Start: 08/08/00 12:17	Millward,R				pending
	VASCULAR LAB/VASCULAR SURGERY (MTZ) Cons Consultant's Choice	Start: 08/02/00 18:54	Velez,P				pending
	PRE-OPERATIVE CARDIOLOGY EVALU Cons Consultant's Choice	Start: 07/28/00 13:11	Dow,J				pending
	PRIMARY CARE (SAC/MATHER) Cons Consultant's Choice WITHIN 1 MONTH	Start: 07/27/00 14:48	Barrow,P				pending
	TESTING ONLY Cons Consultant's Choice	Start: 07/26/00 15:24	Wong,K				pending
	TESTING ONLY Cons Consultant's Choice	Start: 07/17/00 08:13	Ellington,S				pending
	DERMATOLOGY (SAC/MATHER) Cons Consultant's Choice WITHIN 1 MONTH	Start: 07/07/00 13:47	Hu,C				pending
	Consultant's Choice	Start: 06/30/00 15:44	Millward,R				pending
	HEMATOLOGY/ONCOLOGY (MTZ) Cons Consultant's Choice	Start: 06/23/00 10:13	Broden,K				pending
	Consultant's Choice	Start: 06/22/00 17:14	Baleria,D				pending
	Consult to TESTING ONLY Consultant's Choice	Start: 06/14/00 14:12	Austria,B				pending

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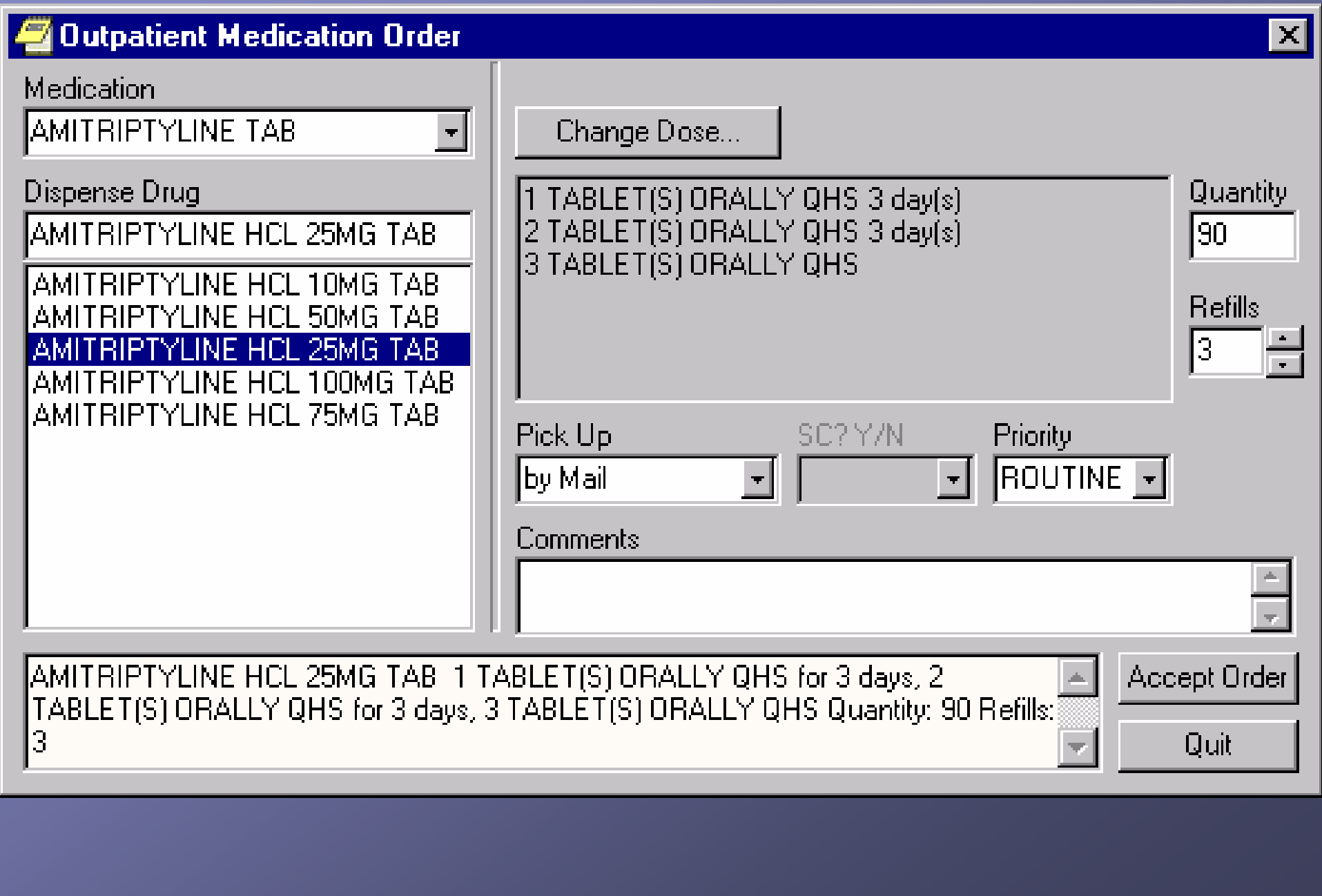
Start | SmarTerm Offi... | VISN 21 - Mic... | CD Player | Document1 - ... | CPRS - Pa... | Microsoft Pow... | printkey | 1:41 PM


Outpatient Medication Order
Medication
AMITRIPTYLINE TAB
Change Dose...
Dispense Drug
AMITRIPTYLINE HCL 25MG TAB
AMITRIPTYLINE HCL 10MG TAB
AMITRIPTYLINE HCL 50MG TAB
AMITRIPTYLINE HCL 25MG TAB
AMITRIPTYLINE HCL 100MG TAB
AMITRIPTYLINE HCL 75MG TAB
1 TABLET(S) ORALLY QHS 3 day(s)
2 TABLET(S) ORALLY QHS 3 day(s)
3 TABLET(S) ORALLY QHS
Quantity
90
Refills
3
Pick Up
by Mail
SC? Y/N
Priority
ROUTINE
Comments
AMITRIPTYLINE HCL 25MG TAB 1 TABLET(S) ORALLY QHS for 3 days, 2 TABLET(S) ORALLY QHS for 3 days, 3 TABLET(S) ORALLY QHS Quantity: 90 Refills: 3
Accept Order
Quit

“The good thing about a legacy system is that you have one…”

Homer R. Warner, MD, PhD
ACMI; member, National Academy of Sciences;
Chairman emeritus, University of Utah
Department of Med Informatics

Limitations of VistA legacy

- Data standardization lacking among sites
- Local EHR repositories (of non-standard data)
  - Limited “Remote Data Views” from other VAMC
  - Recent Federal Health Information Exchange (FHIE) with DoD inside RDV paradigm
- Limited “computability” of EHR data
  - Mappings from VistA clinical systems to standard coding systems is limited (e.g., Problem List)
  - VistA doesn’t take advantage of robustly computable terminologies such as SNOMED

State of the STATE file

	San Francisco	Manila	Lexington
IEN #2	Alaska	Alaska	Alaska
IEN #61	Manitoba	Canal Zone	(no entry)
IEN #91	(no entry)	Canada	Mexico
IEN #99	France	Quebec	(no entry)

“Getting to Yes”

- 3396 instances of “Yes – No” code sets in DoD, VA, and IHS systems
  - Over 800 in VA systems, 5 in the “New Person” file alone!
- 30 unique ways to say it
  - E.g. Yes = 1 No = 2
  - E.g. Yes = Y No = 0 …

National Drug Codes (NDC)

NDC: 00179038202

N 201

N 703

N 701

NDC: 00102161289

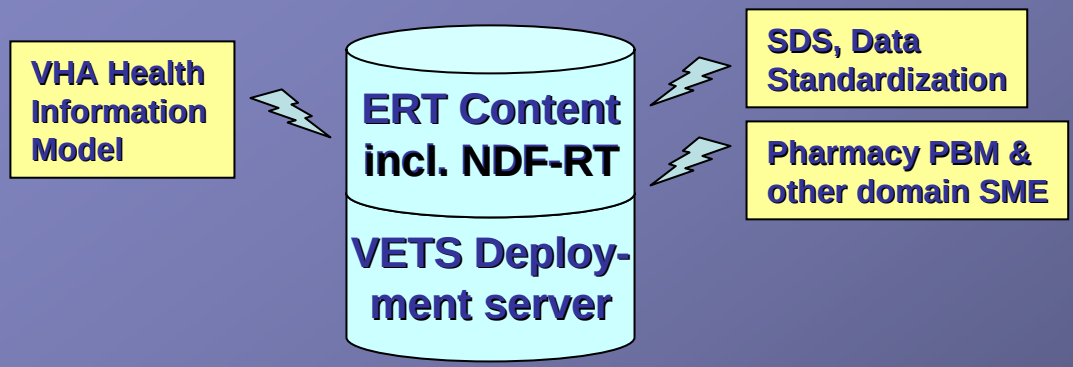
NDC: 00603548932

Propranolol
10Mg Tab

Enterprise Terminology Systems initiative in VHA

- Enterprise-centric terminology
  - "All applications/services shall use an enterprise level service as the single authoritative source for terminology." (Core Specifications for Re-hosting Initiatives, July 2004)
- ETS terminologists and Data Standardization project analyze, create, and implement:
  - Content standards for …Pharmacy, Lab, Allergy, Documents, and other clinical domains
  - Server systems to host and deploy the content
  - A "New Term Rapid Turnaround" system responsive to field requests for additional content

Enterprise Terminology approach



- Robust maintenance tools: programmable, extensible, vendor-based as appropriate
- Good terminology practices: VUIDs, versioning, concept permanence, etc *
- Computerized quality control
  - Concept classification engine
  - Smart maintenance: New Term Rapid Turnaround, SDO updates by subscription, FDA Structured Label, New Drug Transaction…etc.
  - Harmonization of multiple domains
- Focus on CHI and NCVHS designated standards
- Meet HealtheVet architectural guidelines
- Standard APIs

- www.hl7.org/library/committees/ vocab/Good_Vocab_Practices_May_00_Cleveland.doc

Standards used in VHA

- HIPAA mandated code sets
  - ICD-9 CM, HCPCS, CPT
- SNOMED-CT
  - Federal license includes ICD-▪9 CM map
- Drug terminology
  - UMLS RxNorm & VA National Drug File Reference Terminology (NDF-RT)
- Laboratory Observation and Identifiers Numeric Codes (LOINC)

Standards used in VHA (2)

- “Clinical LOINC”, the part of LOINC dealing with non-laboratory results
  - Document Titles
- VHA terminology subsets
  - Allergy & vital signs: mapped to SNOMED
  - Diagnosis & Procedures subsets, mapped to SNOMED-CT
    - Kaiser Permanente-VHA collaboration

Standardizing Lab Data

- Each of 128 VHA sites uses different “Lab file” to name results
  - “Serum sodium” at SLC VAMC
  - “Serum NA+” at Nashville VAMC
- Non computable results mean a provider must read to understand
  - Computerized support not operative across sites
  - Unable to aggregate data across sites

Standardizing Lab

- CHI recommendation to use Lab-LOINC for laboratory results
- All 128 VistA databases extracted
  - 294,161 total tests; chemistry tests to be mapped (193,784 active chem)
  - Ca. 90% amenable to central mapping to LOINC using RELMA
  - Remaining ca. 10% required additional information from local site

Standardizing Problems

- Previously VHA used “Lexicon Utility”, based on UMLS, used to name patient problems
  - Difficulty of “unresolved” (to ICD-9) problem narratives
  - Alternative is to limit clinicians to use ICD-9 & CPT only to represent clinical entities
- Administrative codes inadequate to represent clinical entities
  - Example: *Mitral valve prolapse with valve regurgitation* SCTID 409712001 codes to *Mitral valve disorders* ICD-9 CM 424.0

VHA approach to Problem List

- VHA Problem: Clinicians can't "document once" with documentation be "reused many times", e.g. for billing or reporting disease morbidity
- Good solution: transition to SNOMED-CT based "Diagnosis Subset"
  - "Diagnosis" recognizes re-use outside of PL application
  - Collaboration with Kaiser to create subset
  - Subset includes mapping of SNOMED to ICD-9 CM
- Enhanced solution: Jim Campbell/AHIMA and others working on knowledge base for ICD-9 CM coding from SNOMED

ICD-9 CM mapping

- "Out of the box" ICD mapping in Federal SNOMED license
  - Result is "one best" ICD code
  - Works in one direction only: one SNOMED-> single best ICD-9 term (reverse would be have to be one to many)
- Not adequate for billing:
  - No account of co-occurring conditions, age, other factors

Why do SNOMED to ICD-9 CM mapping?

- Enter clinical data using a clinical terminology
  - Example: SNOMED CT Concept ID 27679008 – Pulmonary Hypertension with extreme obesity
  - Map to: ICD-9-CM target codes 416.8|278.00
- “Code once, use many times”
  - A map from a clinical terminology to a classification scheme such as ICD-9-CM provides important billing information

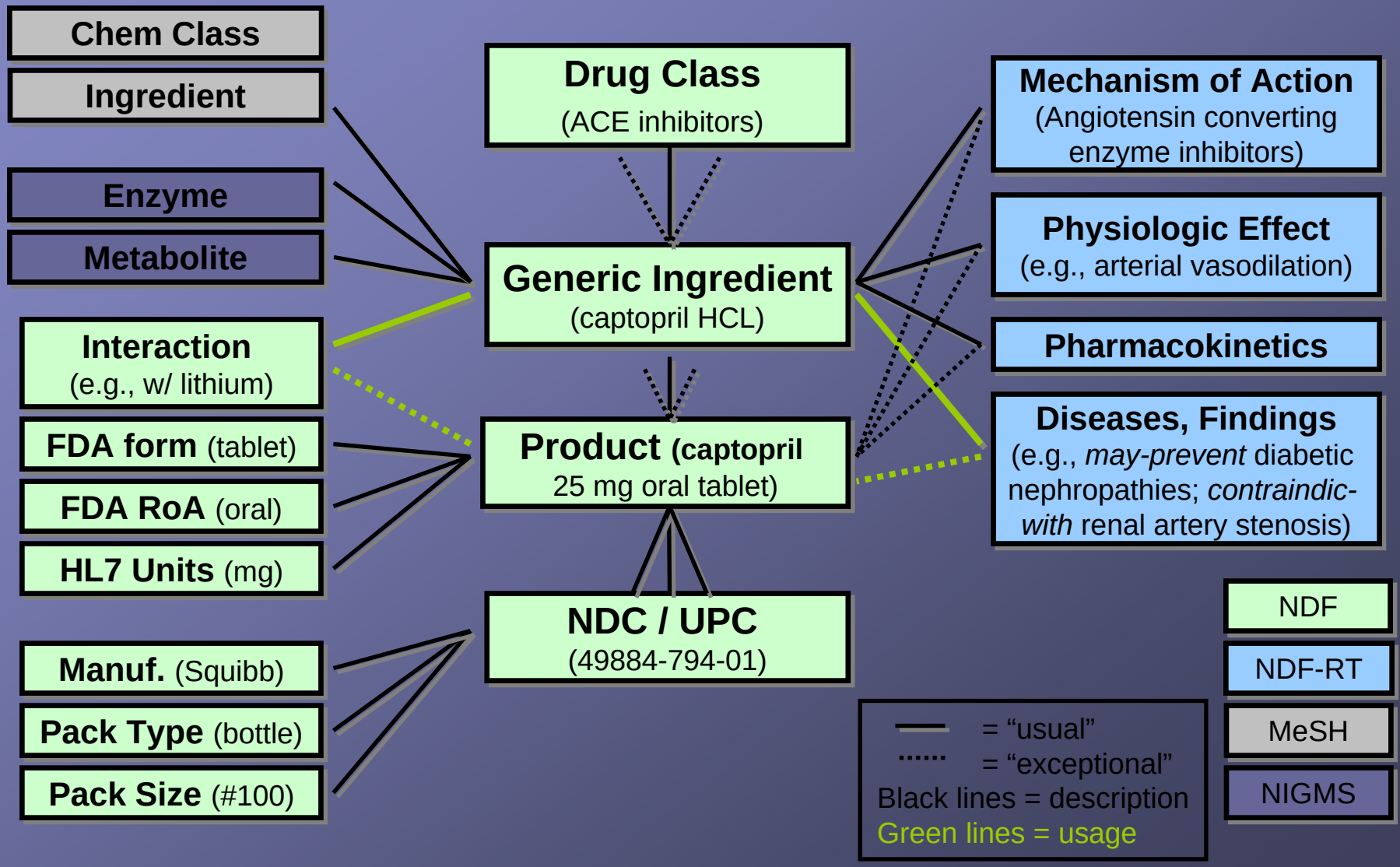
Available SNOMED mappings

- SNOMED-CT to ICD-9 CM available under Federal license
- Other mappings (extra $$ as these are not licensed by Feds)
  - ICD-10 and OPCS 4 in accordance with U.K. standards
  - ICD-O (Oncology) v3
  - Nursing classifications (NANDA, NIC, NOC, PNDS, Omaha)

VHA Drug Terminologies and mappings

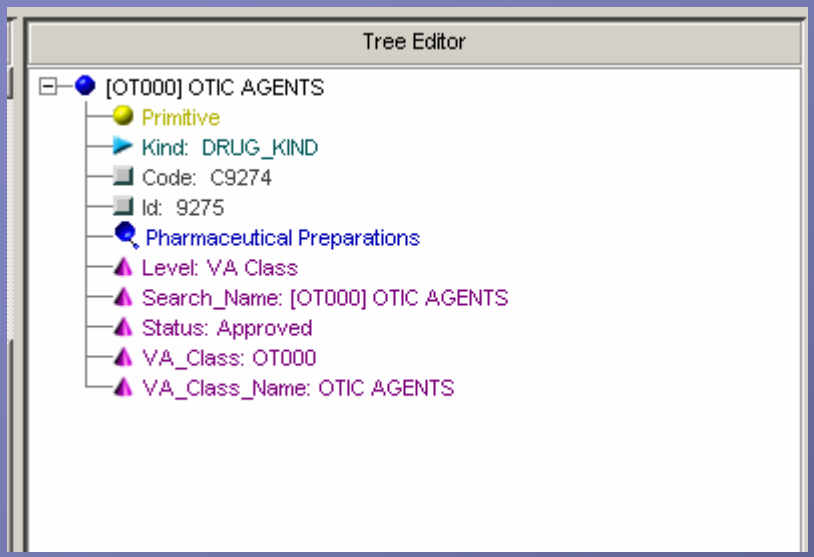
- VHA has created National Drug File Reference Terminology (NDF-RT)
  - Reference information model includes mappings to internal VA standards and external standards
- External standards
  - Drug database vendor information
  - UMLS diseases & SNOMED CT diseases

NDF-RT Model


Chem Class
Ingredient
Enzyme
Metabolite
Interaction
(e.g., w/ lithium)
FDA form (tablet)
FDA RoA (oral)
HL7 Units (mg)
Manuf. (Squibb)
Pack Type (bottle)
Pack Size (#100)
Drug Class
(ACE inhibitors)
Generic Ingredient
(captopril HCL)
Product (captopril
25 mg oral tablet)
NDC / UPC
(49884-794-01)
Mechanism of Action
(Angiotensin converting enzyme inhibitors)
Physiologic Effect
(e.g., arterial vasodilation)
Pharmacokinetics
Diseases, Findings
(e.g., may-prevent diabetic nephropathies; contraindic-with renal artery stenosis)
= "usual"
= "exceptional"
Black lines = description
Green lines = usage
NDF
NDF-RT
MeSH
NIGMS

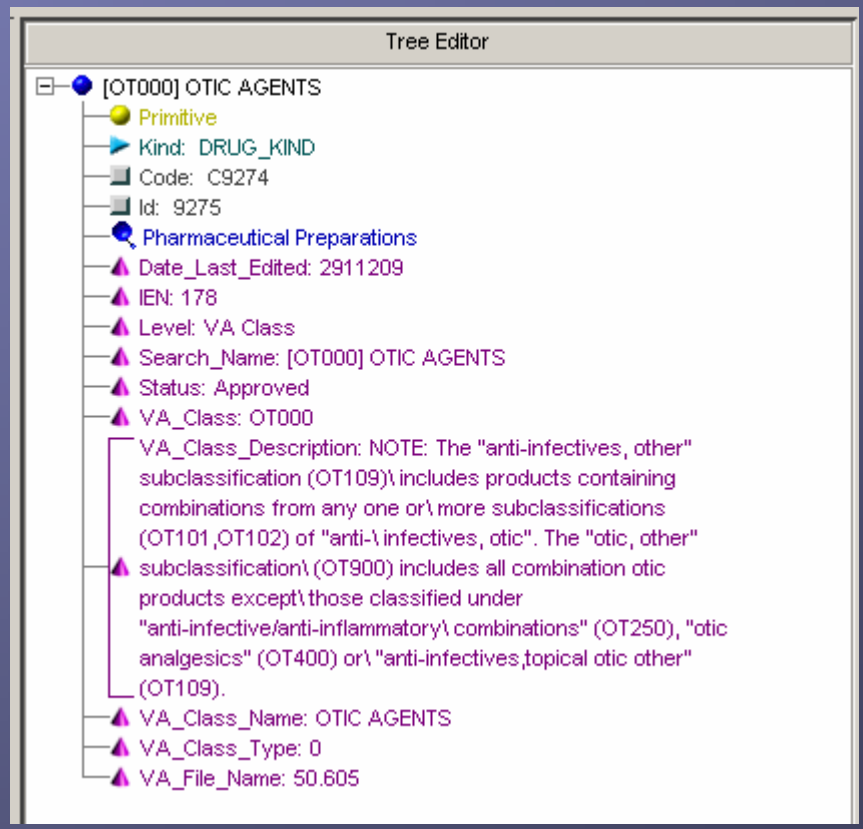
VA class information added

NDF-RT 2004



Lacked some NDF fields required by VistA…

NDF-RT 2005



File Name and IEN properties facilitate NDF “reconstruction” for legacy VistA

Types of NDF-RT mappings

- Disease Kinds
  - Mapped to UMLS Diseases
  - Now to be also mapped to SNOMED CT
- Legacy drug sources in VistA
  - VHA “NDF” drug classes, generics, etc
- External sources
  - NDC codes
  - Drug database vendors

Smart maintenance of mappings and other changes

- Terminology maintenance is a “big ticket” item
  - Especially true for drugs: VA faces ca. 200 new products, 500 new supplies, 3000 NDC changes/mo.
  - Hence often infrequent and insufficient
- Take advantage of new data flows and automate the process
  - FDA “Structured Product Label” linked to VHA “New Drug Transaction” imports SPL data into TDE
  - Also extensible to import drug db vendor updates into TDE
  - Subsequent review by VHA Pharmacy Benefits Managers and Pharmacologists

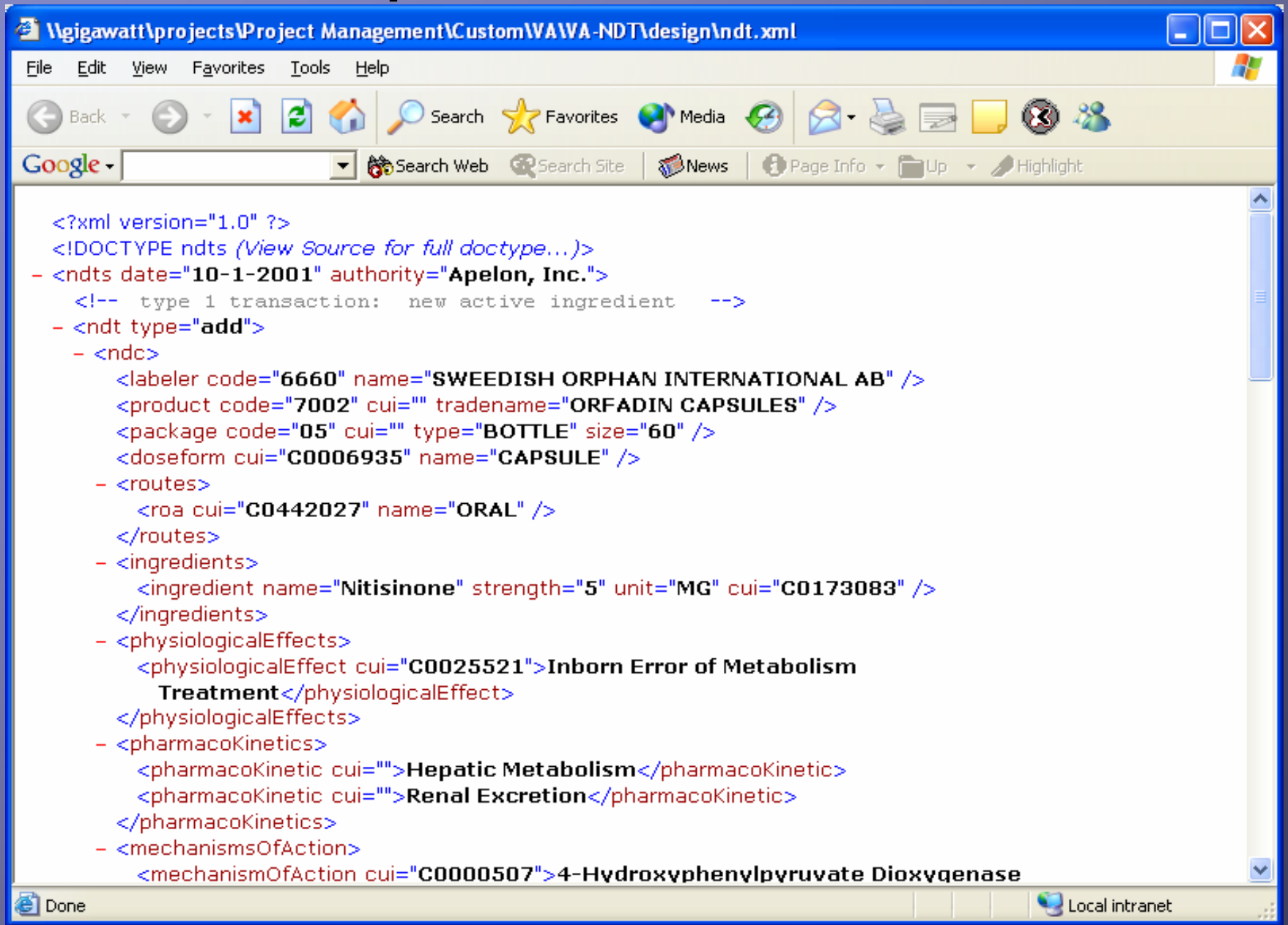
SPL v2: XML example

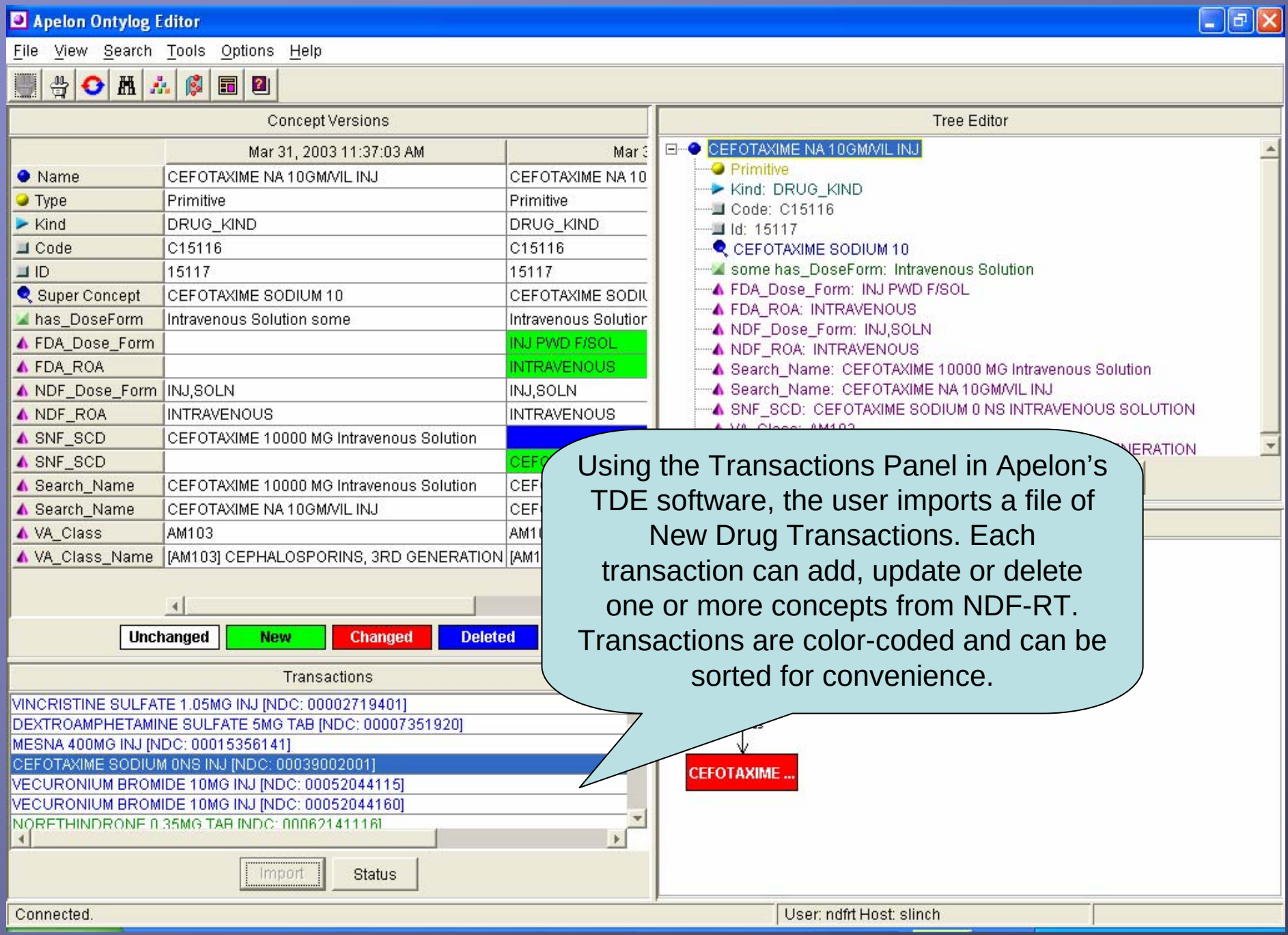
```
<activeIngredient>
        <quantity>
                <numerator value="50" unit="micrograms"/>
                <denominator value="1" unit="mL"/>
        </quantity>
        <substance>
                <code code="TBD" codeSystem="1.2.3.4"
codeSystemName="FDA"/>
                <name>latanoprost</name>
                <activeMoiety>
                        <activeMoietyEntity>
                                <code code="TBD" codeSystem="1.2.3.4"
codeSystemName="FDA"/>
                                <name>latanoprost</name>
                        </activeMoietyEntity>
                </activeMoiety>
        </substance>
</activeIngredient>
```

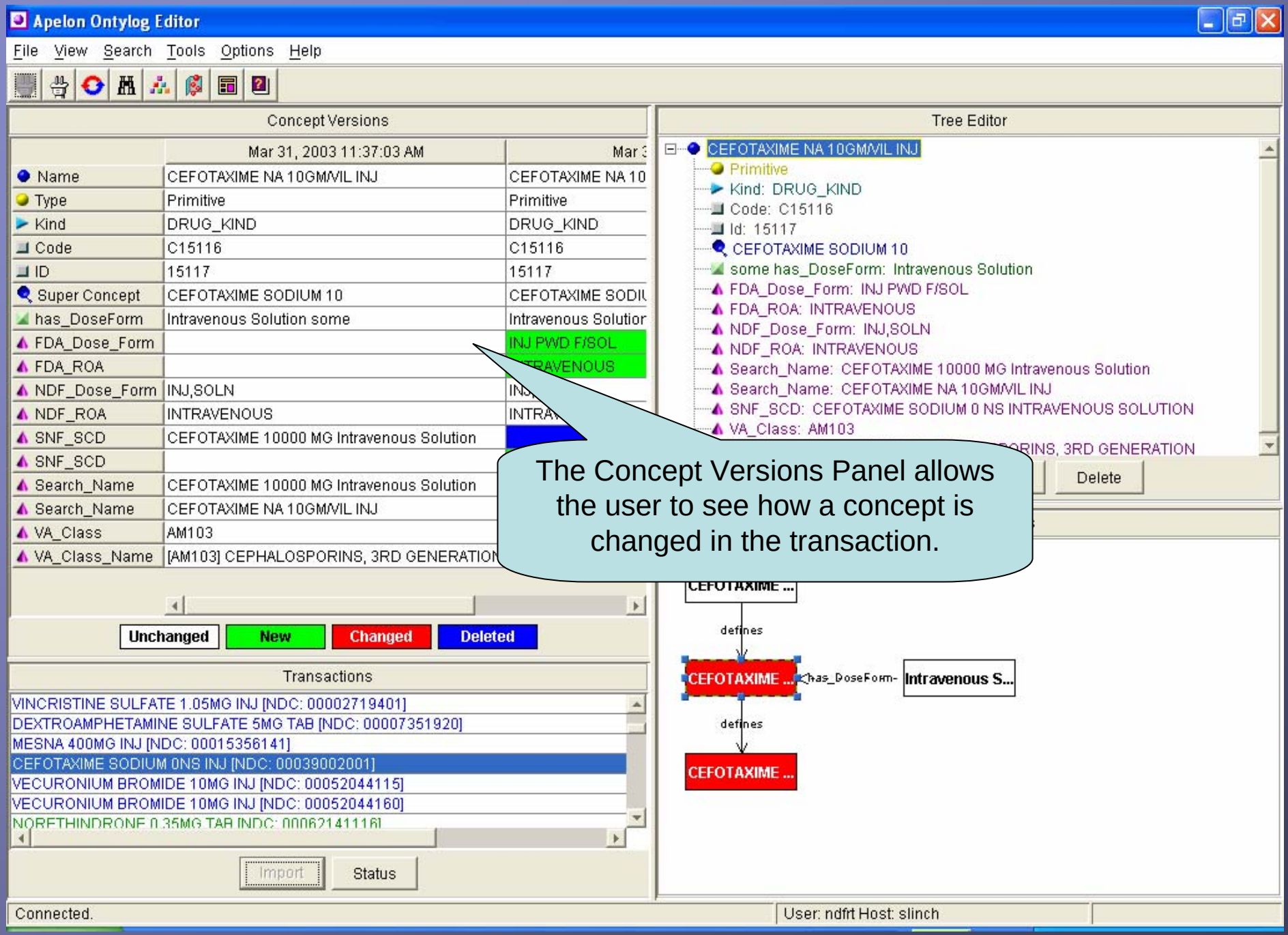
SPL v2 continued…

```
<component>
        <section ID="Indication-Left-Ventricular-Dysfunction-After-Myocardial-Infarction">
                <id root="f22b1663-f5e7-11d8-9eec-01a868e9b85b"/>
                <code code="XSS1" codeSystem="2.16.840.1.113883.6.1" displayName="Indication item subsection"/>
                <title>Left Ventricular Dysfunction After Myocardial...</title>
                <text>
                        <paragraph>CAPOTEN is indicated to improve survival following...</paragraph>
                </text>
                <excerpt>
                        <highlight>
                                <text>
                                        <paragraph styleCode="Bullet">
                                                <caption>Left Ventricular (LV) Dysfunction after Myocardial...</caption> to improve survival and reduce morbidity in clinically...</paragraph>
```

Sample NDT XML Doc




Apelon Ontylog Editor
File View Search Tools Options Help
Concept Versions
Mar 31, 2003 11:37:03 AM
Name CEFOTAXIME NA 10GM/VIL INJ
Type Primitive
Kind DRUG_KIND
Code C15116
ID 15117
Super Concept CEFOTAXIME SODIUM 10
has_DoseForm Intravenous Solution some
FDA_Dose_Form INJ PWD F/SOL
FDA_ROA INTRAVENOUS
NDF_Dose_Form INJ,SOLN
NDF_ROA INTRAVENOUS
SNF_SCD CEFOTAXIME 10000 MG Intravenous Solution
Search_Name CEFOTAXIME 10000 MG Intravenous Solution
Search_Name CEFOTAXIME NA 10GM/VIL INJ
VA_Class AM103
VA_Class_Name [AM103] CEPHALOSPORINS, 3RD GENERATION
Unchanged
New
Changed
Deleted
Transactions
VINCRISTINE SULFATE 1.05MG INJ [NDC: 00002719401]
DEXTROAMPHETAMINE SULFATE 5MG TAB [NDC: 00007351920]
MESNA 400MG INJ [NDC: 00015356141]
CEFOTAXIME SODIUM 0NS INJ [NDC: 00039002001]
VECURONIUM BROMIDE 10MG INJ [NDC: 00052044115]
VECURONIUM BROMIDE 10MG INJ [NDC: 00052044160]
Import
Status
Tree Editor
CEFOTAXIME NA 10GM/VIL INJ
Primitive
Kind: DRUG_KIND
Code: C15116
Id: 15117
CEFOTAXIME SODIUM 10
some has_DoseForm: Intravenous Solution
FDA_Dose_Form: INJ PWD F/SOL
FDA_ROA: INTRAVENOUS
NDF_Dose_Form: INJ,SOLN
NDF_ROA: INTRAVENOUS
Search_Name: CEFOTAXIME 10000 MG Intravenous Solution
Search_Name: CEFOTAXIME NA 10GM/VIL INJ
SNF_SCD: CEFOTAXIME SODIUM 0 NS INTRAVENOUS SOLUTION
CEFOTAXIME ...
Using the Transactions Panel in Apelon's TDE software, the user imports a file of New Drug Transactions. Each transaction can add, update or delete one or more concepts from NDF-RT. Transactions are color-coded and can be sorted for convenience.
Connected.
User: ndfrt Host: slinch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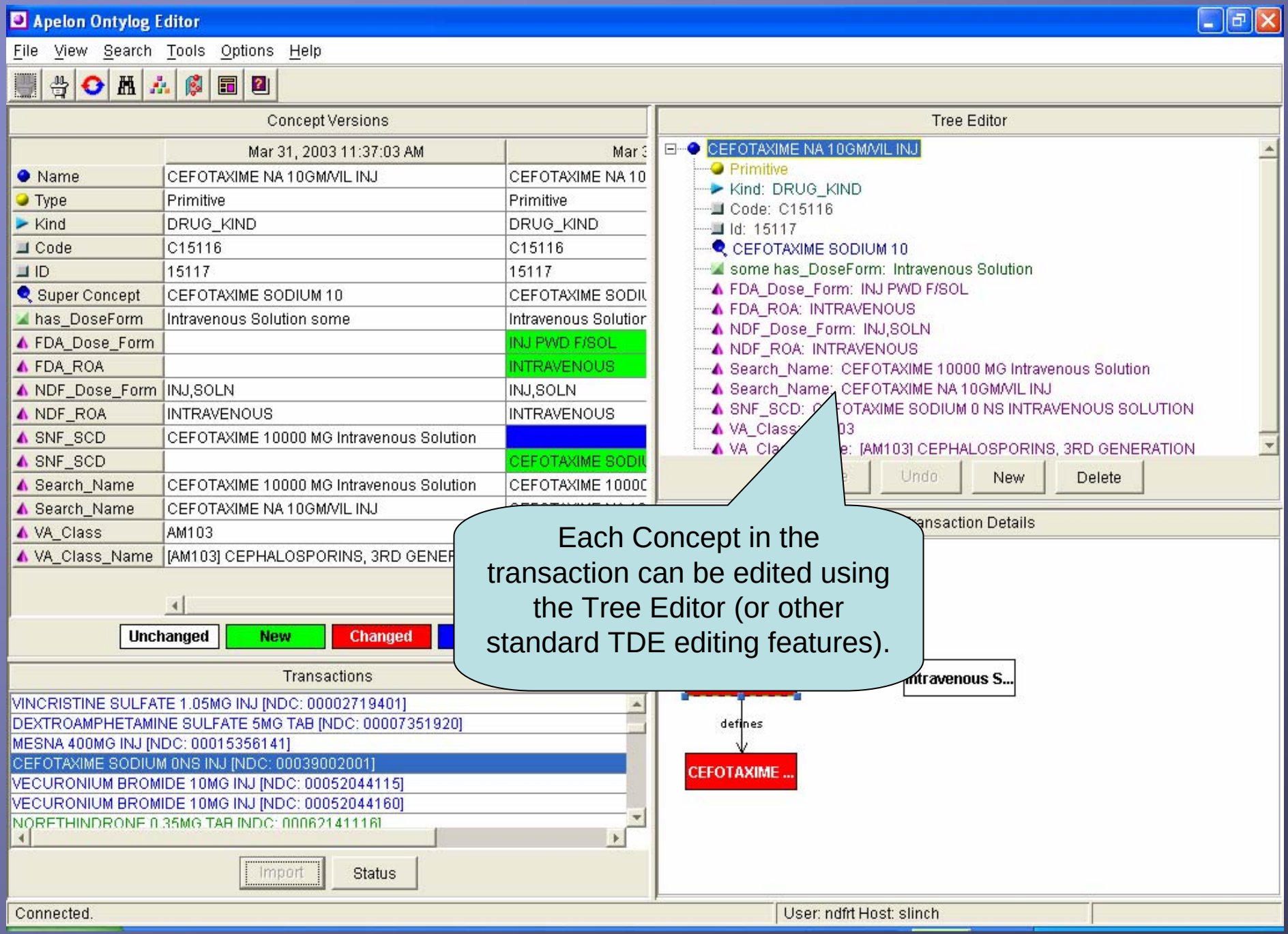
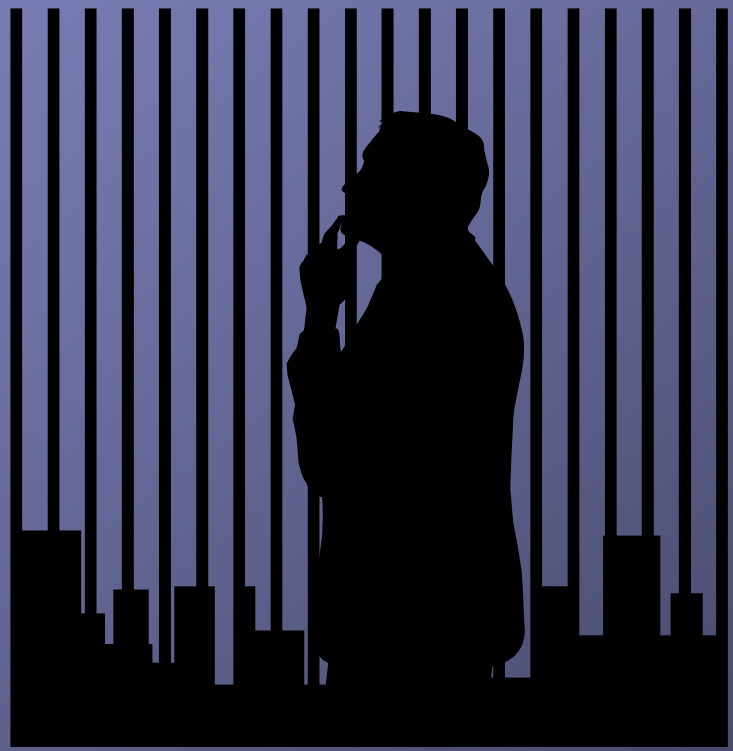
Super Concept CEFOTAXIME SODIUM 10
has_DoseForm Intravenous Solution some
FDA_Dose_Form
FDA_ROA
NDF_Dose_Form INJ,SOLN
NDF_ROA INTRAVENOUS
SNF_SCD CEFOTAXIME 10000 MG Intravenous Solution
SNF_SCD
Search_Name CEFOTAXIME 10000 MG Intravenous Solution
Search_Name CEFOTAXIME NA 10GM/VIL INJ
VA_Class AM103
VA_Class_Name [AM103] CEPHALOSPORINS, 3RD GENERATION
Unchanged
New
Changed
Deleted
Transactions
VINCRISTINE SULFATE 1.05MG INJ [NDC: 00002719401]
DEXTROAMPHETAMINE SULFATE 5MG TAB [NDC: 00007351920]
MESNA 400MG INJ [NDC: 00015356141]
CEFOTAXIME SODIUM 0NS INJ [NDC: 00039002001]
VECURONIUM BROMIDE 10MG INJ [NDC: 00052044115]
VECURONIUM BROMIDE 10MG INJ [NDC: 00052044160]
Import
Status
Tree Editor
CEFOTAXIME NA 10GM/VIL INJ
Primitive
Kind: DRUG_KIND
Code: C15116
Id: 15117
CEFOTAXIME SODIUM 10
some has_DoseForm: Intravenous Solution
FDA_Dose_Form: INJ PWD F/SOL
FDA_ROA: INTRAVENOUS
NDF_Dose_Form: INJ,SOLN
NDF_ROA: INTRAVENOUS
Search_Name: CEFOTAXIME 10000 MG Intravenous Solution
Search_Name: CEFOTAXIME NA 10GM/VIL INJ
SNF_SCD: CEFOTAXIME SODIUM 0 NS INTRAVENOUS SOLUTION
VA_Class: AM103
Delete
The Concept Versions Panel allows the user to see how a concept is changed in the transaction.
defines
CEFOTAXIME ...
has_DoseForm
Intravenous S...
defines
CEFOTAXIME ...
Connected.
User: ndfrt Host: slinch


Apelon Ontylog Editor
File View Search Tools Options Help
Concept Versions
Mar 31, 2003 11:37:03 AM
Name CEFOTAXIME NA 10GM/VIL INJ
Type Primitive
Kind DRUG_KIND
Code C15116
ID 15117
Super Concept CEFOTAXIME SODIUM 10
has_DoseForm Intravenous Solution some
FDA_Dose_Form INJ PWD F/SOL
FDA_ROA INTRAVENOUS
NDF_Dose_Form INJ,SOLN
NDF_ROA INTRAVENOUS
SNF_SCD CEFOTAXIME 10000 MG Intravenous Solution
SNF_SCD CEFOTAXIME SODIU
Search_Name CEFOTAXIME 10000 MG Intravenous Solution
Search_Name CEFOTAXIME NA 10GM/VIL INJ
VA_Class AM103
VA_Class_Name [AM103] CEPHALOSPORINS, 3RD GENER
Unchanged
New
Changed
Tree Editor
CEFOTAXIME NA 10GM/VIL INJ
Primitive
Kind: DRUG_KIND
Code: C15116
Id: 15117
CEFOTAXIME SODIUM 10
some has_DoseForm: Intravenous Solution
FDA_Dose_Form: INJ PWD F/SOL
FDA_ROA: INTRAVENOUS
NDF_Dose_Form: INJ,SOLN
NDF_ROA: INTRAVENOUS
Search_Name: CEFOTAXIME 10000 MG Intravenous Solution
Search_Name: CEFOTAXIME NA 10GM/VIL INJ
VA_Class: AM103
VA_Class_Name: [AM103] CEPHALOSPORINS, 3RD GENERATION
Undo
New
Delete
Each Concept in the transaction can be edited using the Tree Editor (or other standard TDE editing features).
Transactions
VINCRISTINE SULFATE 1.05MG INJ [NDC: 00002719401]
DEXTROAMPHETAMINE SULFATE 5MG TAB [NDC: 00007351920]
MESNA 400MG INJ [NDC: 00015356141]
CEFOTAXIME SODIUM 0NS INJ [NDC: 00039002001]
VECURONIUM BROMIDE 10MG INJ [NDC: 00052044115]
VECURONIUM BROMIDE 10MG INJ [NDC: 00052044160]
Import
Status
Transaction Details
defines
CEFOTAXIME ...
Connected.
User: ndfrt Host: slinch

Mapping tools used

- Domain specific tools: RELMA (REgenstrief LOINC Mapping Assistant)
  - http://www.loinc.org
- Apelon TermWorks: an Excel plugin for mapping spreadsheets; requires Apelon terminology server
  - http://www.apelon.com/products/termworks.htm
- Apelon Terminology Development Environment (TDE)
- SNOMED CT “CLUE” Browser
  - Provided by Clinical Information Consultancy, http://www.clininfo.co.uk/clue5/clue.htm

Question Time



Clinical Vocabulary Mapping Methods Institute
Saturday, October 15, 2005