

Chemotherapy Order Management System (COMS)

Electronic Ordering and Administration Documentation for Oncology

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Poll Question #1

My primary role in the VA is _____.

- ▶ Research investigator
- ▶ Physician
- ▶ Pharmacist
- ▶ Data manager
- ▶ Other (specify)

Poll Question #2

My primary role in the care of Veterans is
-----.

- ▶ Oncology Specialty Care Provider
- ▶ Quality Manager
- ▶ Pharmacist
- ▶ Researcher
- ▶ Other (specify)

Outline

- ▶ History and current state of chemo ordering
- ▶ Business requirements
- ▶ COMS component modules and architecture
- ▶ COMS pilot software
- ▶ Development team and contact information

Current State of Chemotherapy Ordering in VHA

- ▶ Largest integrated health care system
- ▶ Increasing incidence of cancer
- ▶ Increasing complexity of anti-cancer drugs
- ▶ Limited direct order entry
 - COTS product
 - CPRS
- ▶ Paper orders common

History

- ▶ Chemotherapy has a narrow therapeutic window
 - High toxicity
 - Low tolerance for error
- ▶ Implementation of Electronic Health Record in VHA in late 1990s did not accommodate chemotherapy ordering
- ▶ Multiple requests for electronic ordering of chemo dating to early 2000s
- ▶ In 2009, VA Center for Innovations Employee Innovation Competition selected chemotherapy ordering

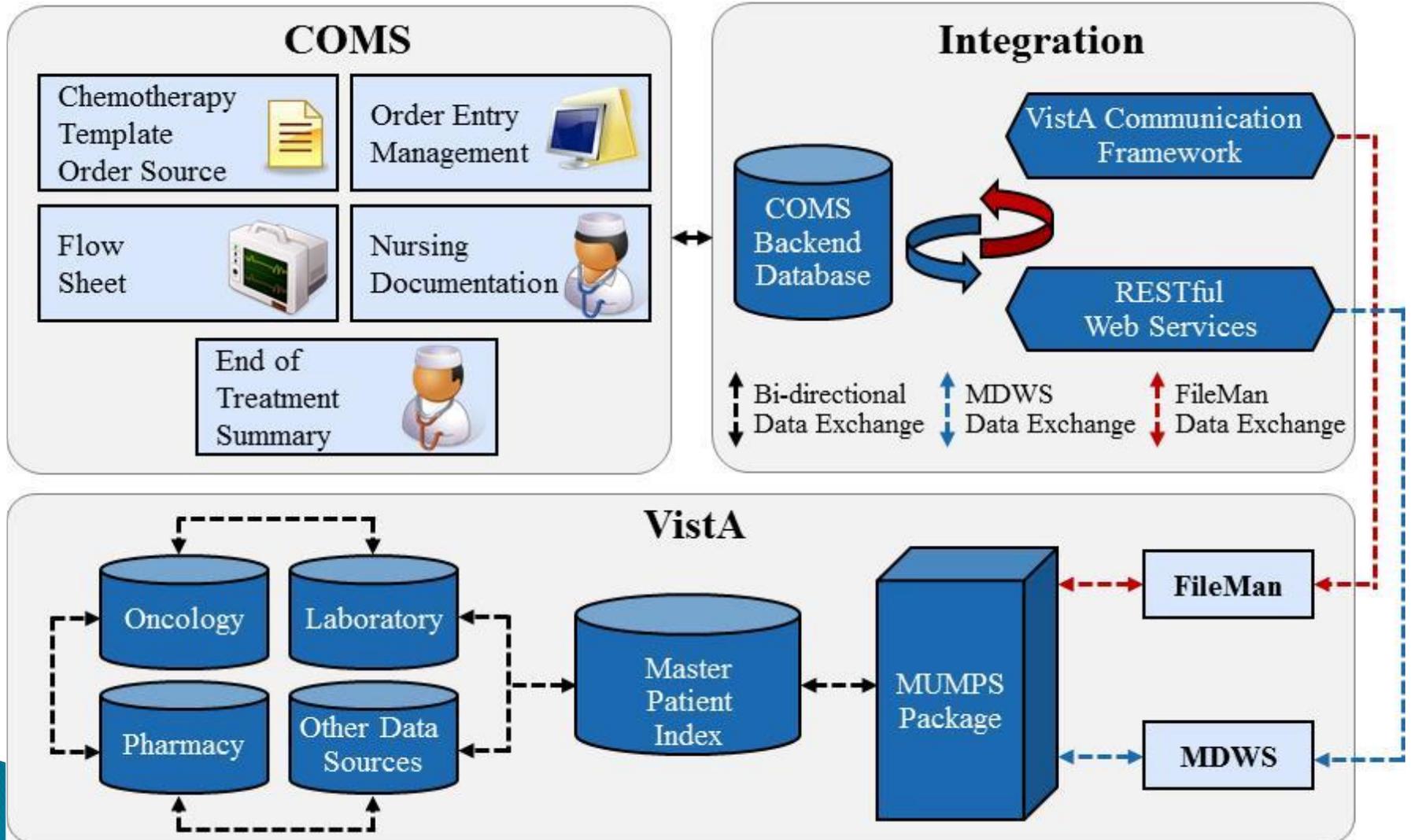
Business Requirements

- National set of chemotherapy order templates
- Standardization of calculation method of dose and dose rounding
- Standard documentation for chemotherapy treatment plans, administration, and summaries
 - ▶ Accommodation of local facility policies for clinical preferences/processes
 - ▶ Exportability of chemotherapy templates
 - ▶ Fulfills legal and professional requirements,
 - Joint Commission compliance
 - Documentation in VistA
 - Enhances patient safety

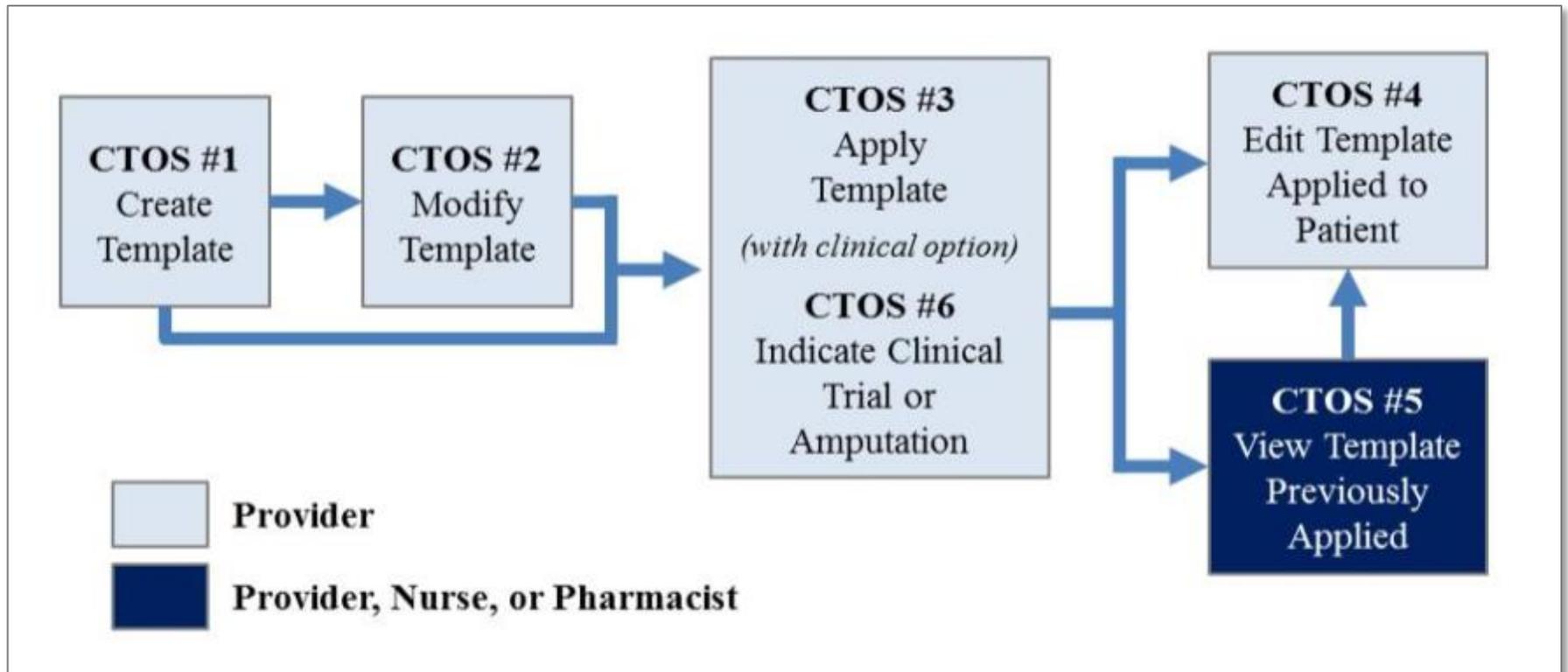
COMS Components

- Chemotherapy Template Order Source (CTOS) -- central library of vetted chemotherapy regimen templates plus functionality to create, download, and modify templates
- Order Entry Management (OEM) – application of a template to a patient with dose calculation and order editing and entry
- Treatment Documentation (TD) – tool to document drug administration
- Flow Sheet (FS) – matrixed time–line of oncology–relevant clinical data
- End of Treatment Summary (EoTS) -- a chronological history of oncological diagnosis, treatment, toxicity, tumor response, and recommendations for future care

COMS Architecture



COMS Architecture: CTOS Module



Chemotherapy Order Management System (COMS)

Proof of Concept - Demo System

Welcome Programmer, All Roles -- [Help](#) [Switch to High Contrast Mode](#)

[Patient](#) [Orders](#) [Template Authoring](#) [Template List](#) [Messages](#) [Site Configuration](#)

Patient Selection

Enter a range of Administration Dates to search

From: To: [Select Patient by Administration Date\(s\)](#)

OR

Enter Patient Identification (SSN) to query **CPRS**

Patient Identification (SSN): [Query CPRS for Patient](#)

Note: The Innovations Sandbox/Future Technology Lab contains hundreds of available patients with a numeric last name and "Patient" first name. To search for a patient, use the first letter from the spelling of the number, a zero, and the three digit number itself.

For example,

"ThreeHundredTwenty, Patient" is available as t0320 or T0320;

"OneHundredThirty, Patient" is available as o0130 or O0130 (where the first character is the letter "Oh" as opposed to the number "Zero".)

Due to multiple users accessing patients throughout the COMS Enhancement Period, patients will be allocated as follows:

- VHA/OI&T Stakeholders may use the 100, 200, and 300 series
- Implementation Readiness Analysis and Review Team may use the 400 series
- Development Team may use the 500 series

[_ Help](#) [Logout](#) [Backlogs and Defects](#) [Access History](#)

Search:

Search

Select a Template Source *: My Templates Local Templates National Templates**All templates now available for selection**

Select a Template *: COMS Testing

[Print](#) Template**CANCER CHEMOTHERAPY IV ORDER SHEET****Max Number of Cycles:** 4 **Cycle Length:** 4 Weeks**Chemotherapy Regimen Name:** 2014-1-0001-ABCD-CARBOPLATIN INJ 250CISPLATIN INJ,SOLN 300DIPHENHYDRAMINE CAP,ORAL 75-20140605**Description:** COMS Testing**Emetogenic level:** Moderate**Febrile Neutropenia risk:** 12 %**Reference:** No Clinical Reference - COMS Testing**Pre Therapy**

Instructions: Pre-Therapy Medications for COMS Testing

Sequence #	Drug	Dose	Route	Administration Day
1	RANITIDINE TAB	150.000 mg	Oral	1-28
	Fluid/Volume:		Infusion Time:	
Patient to ingest prior to chemotherapy				
2	DEXAMETHASONE INJ,SOLN	20.000 mg	IVPB	1-28
	Fluid/Volume: D5W 50 ml		Infusion Time: 0 hrs / 30 min	
Administer in dextrose to stabilize blood sugar				
3	DILTIAZEM INJ	400.000 MicroGram	IVP	1-28
	Fluid/Volume:		Infusion Time:	
Provide IV push to control tachycardia				

Therapy

Instructions: Therapy Medications for COMS Testing

Sequence #	Drug	Dose	Route	Administration Day
1	CARBOPLATIN INJ	250 AUC	IVPB	1-28
	Fluid/Volume: Ringer's Lactate 50 ml		Infusion Time: 0 hrs / 30 min	
Administer before Cisplatin administration				
2	CISPLATIN INJ,SOLN	300 mg	IV	1-28
	Fluid/Volume: Ringer's Lactate 500 ml		Infusion Time: 3 hrs / 0 min	
Administer slowly following Carboplatin infusion				
3	DIPHENHYDRAMINE CAP,ORAL	75 mg	Oral	1-28

COMS: Current Development

- ▶ Currently in enhancement phase
 - Stakeholders access test environment
 - Developer-led demonstrations every three weeks with feedback from stakeholders
- ▶ Pilot deployment in November 2014
 - Durham VAMC
 - Puget Sound Health Care System (Seattle VAMC, Tacoma VAMC)
- ▶ Pilot period runs through August 2015

Examples of Enhancements and Corrected Defects

Closed Enhancements - 54 Items

Exact Minute Documentation	Time Parameter for Medication Edits
Name for ND Module	IV Fluid Type Choices
	Linking Templates and Discharge Instructions
Medication Selection (IVP & fluids)	Instructions
Rename Patient History Panel to Patient Vitals	Site Specific Information for Patients
Quick View of Last/Next Administration Dates - FS & TD	Documenting Attendance for Patient Discharge Instructions
Managing Delivery Mechanism Documentation Options	Neutropenia Risk (and Emetogenic Level Risk in C/B Headers)
Security of Verify Codes	Review Previous Order
Printing Templates	TD Drill Down Items
Template Saving	Intelligent Data Entry Detection
Remove Drug Functionality	Height Confirmation
Recently Used Templates	Staging Designation
Body Location for Temperature	PICC Line
Rationale for Changing Templates	Warning of Adverse Reaction History

Closed Defects - 33 Items

COMS Error - Loading Patient Data
ND Module / Treatment Panel - Entries Disappear when Signing
Processing of Performance Status Updates
Patient Failed to Load
COMS Logout Functionality
Unique Name Templates
Site Appearance Symptoms
TD Module Permitted Future Time Entry
Display of COMS-generated Template Names
Incorrect Message for Success of Template Applied
Template Failed to Fully Apply
Misaligned Performance Status Pop-Up
Remove Drug Confirmation for Therapy Medications
Incomplete Display of Treatment Regimens & Summaries
Oxygen Saturation Percentage
Differing KG Weights for Same LG Weight
Incorrect Weight Units Displayed in BSA Calculations

Requirements for COMS

- ▶ Web Server and Database Server (Physical or Virtual)
- ▶ Office of Information Technology Support (Regional and/or Local)
- ▶ Information Security Officer Support
- ▶ Clinician Support (Provider, Pharmacist, Nursing)

Expected Advantages of COMS

- ▶ VA-developed application
 - No software cost to facilities
 - Open source
- ▶ Increased efficiency
- ▶ Error reduction
- ▶ Effective knowledge transfer and sharing
- ▶ Useful clinical workflows
- ▶ Reduced rework

COMS: Summary

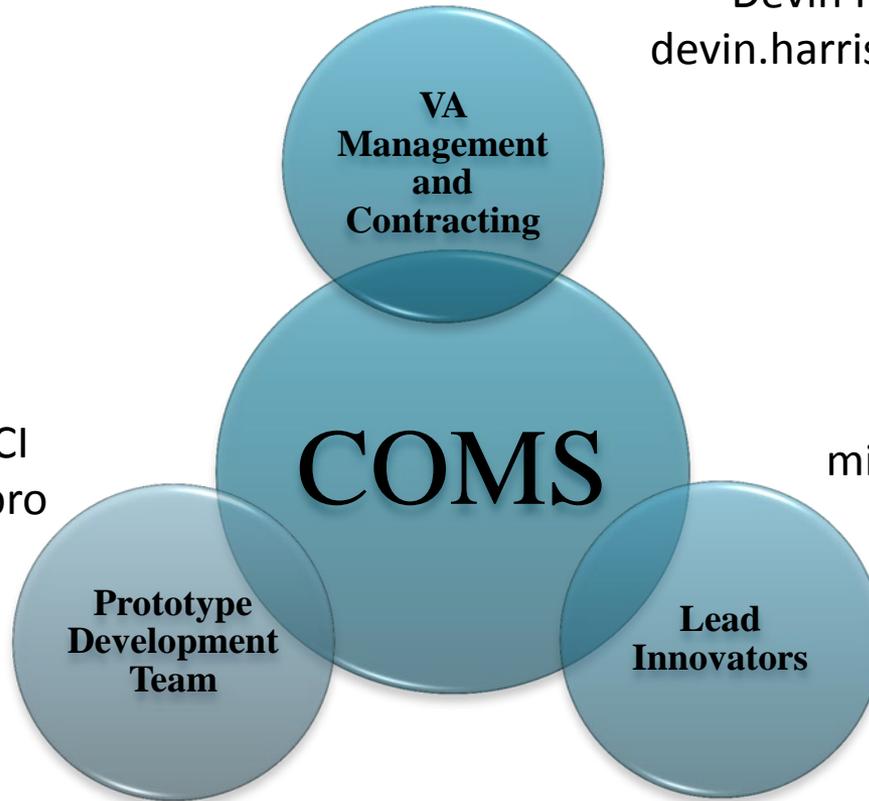
- ▶ Comprehensive chemotherapy order management and oncology documentation
- ▶ Government developed pilot software
 - Significant cost advantage over COTS
- ▶ Readily deployable as enterprise tool to VHA Oncology Services nationwide

COMS: Team Organization

**Innovation
Coordinator/COR:**
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Lead Innovators
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Dr. Daniel Wu
Puget Sound HCS



Project PM:
Louis Ferrucci, CACI
Sean Cassidy, dbITpro

with contributions from many, many others

Questions?

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