

VAA Status and Targets:

Comprehensive, Automated VA Medical Center Workflow and Efficiency Analysis

5/20/25

VA Application Analytics (VAA)
Office of Clinical Informatics
Digital Health Office
Veterans Health Administration
U.S. Department of Veterans Affairs

VAA

Baseline the Clinical Workflow of any VA Medical Center

Objective: **automatically** report on the **complete clinical workflow of any medical center in an objective, portable form** to [a] **recommend workflow efficiency improvements** [b] **aid workflow migration** of the same workflow to new systems (configurations, training)

Approach:

- Non-invasive Capture and Reduction of the clinical application traffic generated by all users of an entire medical center for a 30-day period
- Replay every class of center-specific workflow to ensure reduction is complete
- Generate **Medical Center Clinical Workflow Reports and Configurations**
- This approach could be taken with any system or EHR (“Portable”, “Objective”)
- Use for migration: Focused Training (what’s changed?); Configurations to migrate Workflows

VA Clinical Workflow

Centered around Orders and Templated Notes (“Smart Forms”)

CPRS User Guide content (620 pages) reflects Workflow types and importance

- The “Orders” sections (Meds, Orders, Consults, Labs) represent **68.81%** of the pages.
- The “Notes” sections (Notes, Surgery, Discharge Summary) represent **15.85%** of the pages.
- Other data entry (Problem, Vital ...) is simple and not at all custom
- Summaries in Coversheet and elsewhere leverage ordered items and note types

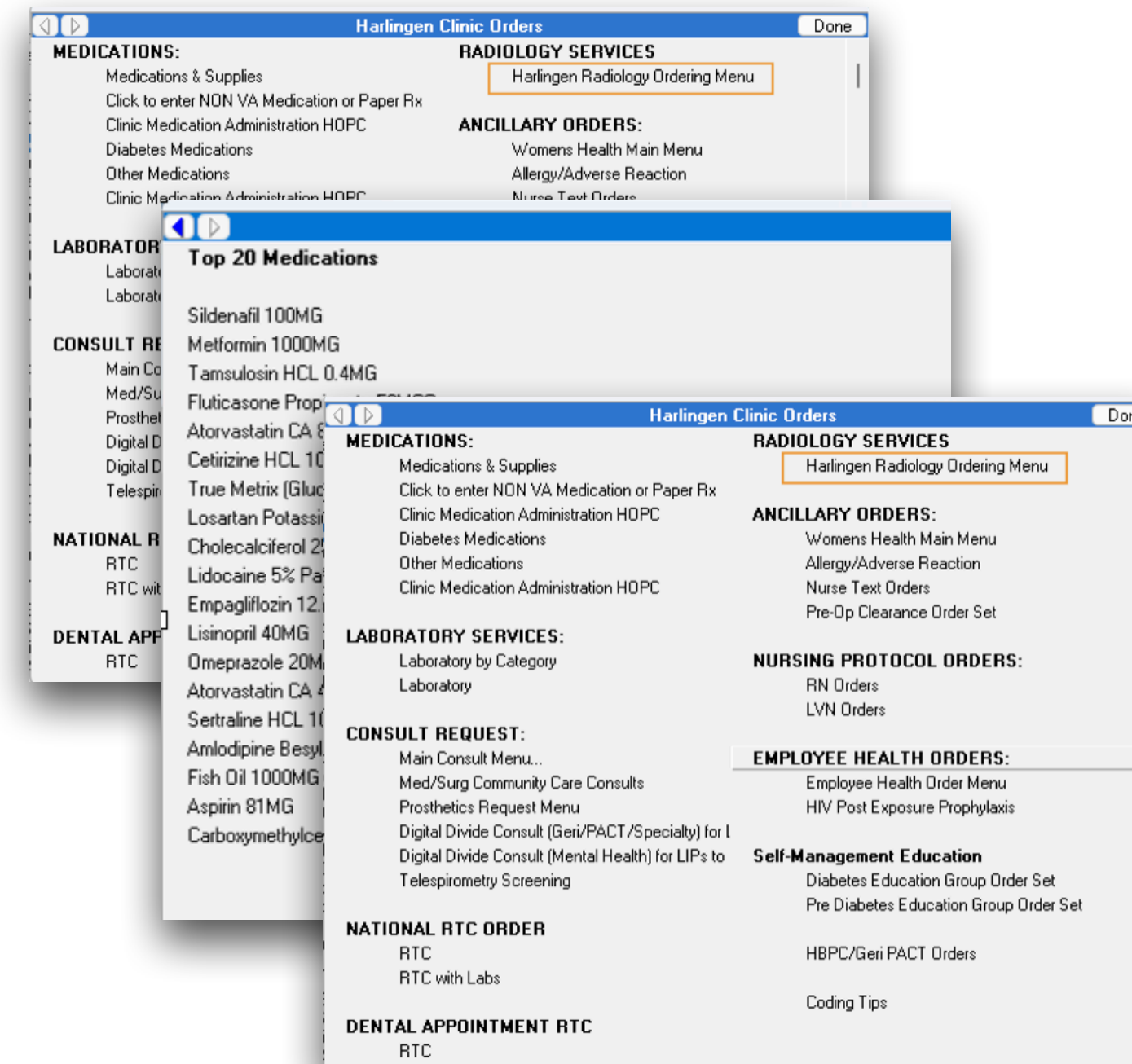
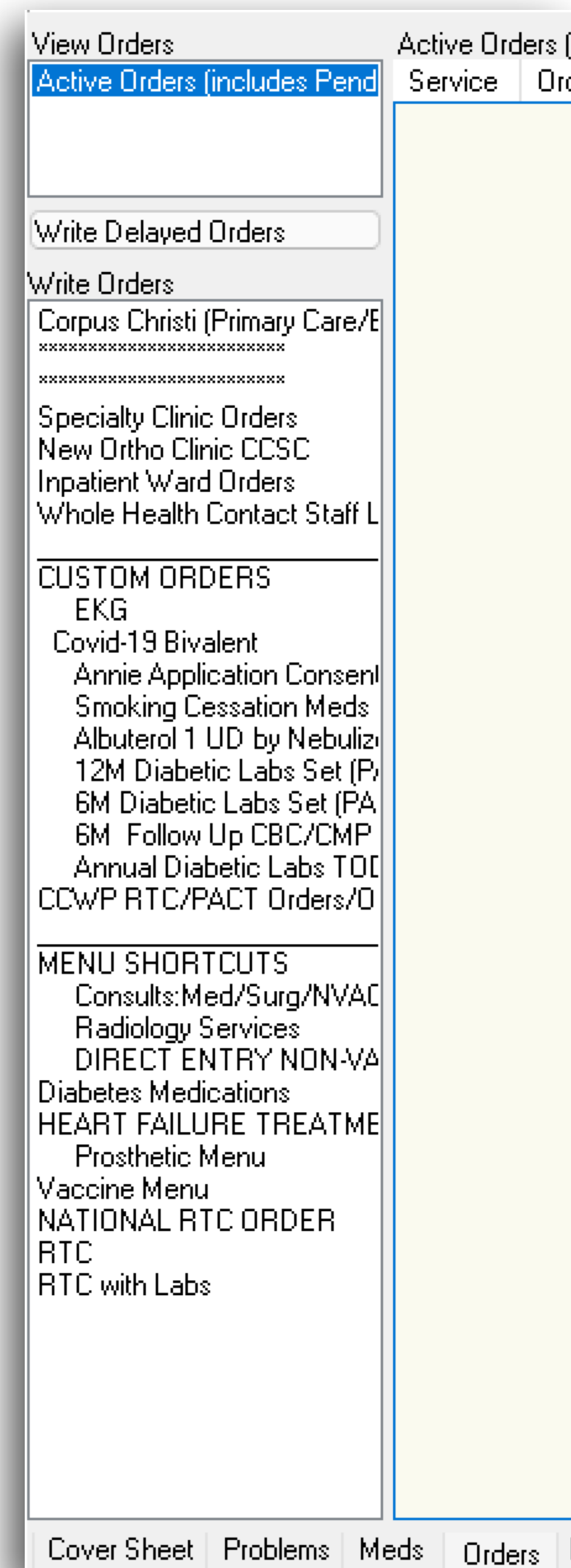
Section	Pages	% of Pages
Coversheet	33	8.17%
Problems	11	2.72%
Immunizations and Skin Test	6	1.49%
Meds	64	15.84%
Orders	180	44.55%
Notes	54	13.37%
Consults	21	5.20%
Surgery	5	1.24%
Discharge Summary	5	1.24%
Labs	13	3.22%
Reports	12	2.97%

Workflow: Navigation that leads to Actions

Navigation: Root Menus + series of Nested Menus

Root Menus (Vertical side bar)

- Entry point for other menus or popular actions
- **Specialized for Medical Discipline, Division, ...**
- VCB: 13
- Omaha: 1,595
- (100x difference)



Nested Menus

- Reflect the important location and groupings for care
- **Doctors are used to these site-specific organizations**
- VCB: 523
(max nesting 12)
- Omaha: 5,392
(max nesting 17)
- (10x difference)

Workflow: Navigation that leads to Actions

***Actions:* Order Sets, Lookups, Templates, Dialogs, Quick Orders**

Order Sets

GI Pre/Intra/Post Set

☐ GI PRE-PROC

☐ GI INTRA-PROC

☐ GI POST PROC

Stop Order Set

Templates

Reason for Request: MRI, LUMBAR SPINE W/O CONTRAST

Total Number of Required Fields without Values: 4

(Evaluation criteria referenced from): ♦

Diagnostic Evaluation of Low Back Pain with Emphasis on Imaging - 2002 ♦♦

(Clinical Concern [select 2 or more]): ♦♦

☐ Fever

☐ Weight loss

☐ Adenopathy

☐ Hx of Intravenous Drug Use

☐ Hx of Cancer (explain below)

☐ ESR > 20mm/hr

☐ Failed conservative treatment

☐ Intolerable Symptoms

☐ Non VA MD order

☐ Other (explain below): ♦

♦♦ (MRI studies are absolutely contraindicated in patients with the following devices; please discuss with Radiologist before completing this order): ♦♦

Cardiac Pacemaker/ICD/Implanted Defibrillator ♦♦

Aneurysm Clips in the Brain

Starr Edwards Cardiac Valve Prosthesis (metal heart valve)

Cochlear Implant (middle ear implant)

Implanted Neural Stimulator

Exams cannot be approved unless all conditions are met and checked. ♦♦

☐ No contraindicated devices

☐ MRI compatible device (include vendor/model in history) ♦♦

☐ Patient is able to lay supine and prone

☐ Not claustrophobic

☐ No injections or procedures in area of interest x 2 weeks ♦♦

Please note that there are weight restrictions for MRI or CT Scans: ♦♦ Patient

* Indicates a Required Field

Lookup Orderables

Outpatient Medications

RSV VACCINE [ABRYSV0] INJ,LYPHL

(No quick orders available)

RSV VACCINE [ABRYSV0] INJ,LYPHL
RUXOLUTINIB 15% CREAM,TOP NF
RUXOLUTINIB <PADR> GROUP 9 [V17] TAB
RYBELSUS <SEMAGLUTIDE TAB> NF
RYBELSUS <PADR GRP 4> <SEMAGLUTIDE <PRIOR AUTH DRUG REQ> GRP 4 TAB >
RYBREXANT <PADR> VISN 17 <ENTRECTINIB <PADR VISN 17> CAP,ORAL> NF
RHYTHMOL <PROPAPFENONE TAB>
SACITUZUMAB <PADR> VISN 17 INJ
SACUBITRIL/VALSARTAN TAB
SALAGEN <PILOCARPINE TAB>
SALICYLIC ACID 17%/FLEXIBLE COLLODION SOLN,TOP
SALICYLIC ACID 3% SHAMPOO
SALICYLIC ACID GEL,TOP NF
SALICYLIC ACID PLASTER,TOP
SALICYLIC ACID/SODIUM THIOSULFATE LOTION NF
SALICYLIC ACID/SULFUR SHAMPOO
SALIVA ARTIFICIAL SPRAY,ORAL
SALMET/FLUTICAS (ADVAIR) <PADR> GRP 5 INH,ORAL
SALONPAS (REGULAR) <CAMPHOR/MENTHOL/METHYL SALICYLATE PATCH>
SALONPAS LARGE PATCH <CAMPHOR/MENTHOL/METHYL SALICYL LARG PATCH>
SALSALATE TAB
SANCTURA XR <PADR> GRP 12 <TROSPIMUM SA <PADR> GROUP 12 CAP,EC>
SANDIMMUNE <CYCLOSPORINE (SANDIMMUNE) CAP,ORAL>
SANDOSTATIN <OCTREOTIDE INJ>
SANDOSTATIN DEPOT <OCTREOTIDE DEPOT INJ,SUSP,SA>
SANDOSTATIN LAR <OCTREOTIDE DEPOT INJ,SUSP,SA>
SANTYL <COLLAGENASE OINT,TOP>
SANUSI <PMCP-CONTROL MED> <SOLRIAMFETOL <PMCP-CONTROL MED> TAB> NF
SARILUMAB <PADR> GROUP 10 INJ NF

OK Quit

Dialog - populate prompts

Imaging Procedure

SONANCE IMAGING

SPINE W/O CONTRAST

Reason for Study (REQUIRED - 64 characters maximum)

Lumbar radiculopathy

Clinical History (Optional)

Intolerable Symptoms

No contraindicated devices

Date Desired

Apr 24, 2025

Urgency

ROUTINE

Transport

AMBULATORY

Category

OUTPATIENT

Submit To

HRL MRI

Exams Over the Last 7 Days

Isolation

Pregnant

Yes No Unknown

PreOp Scheduled

Remove

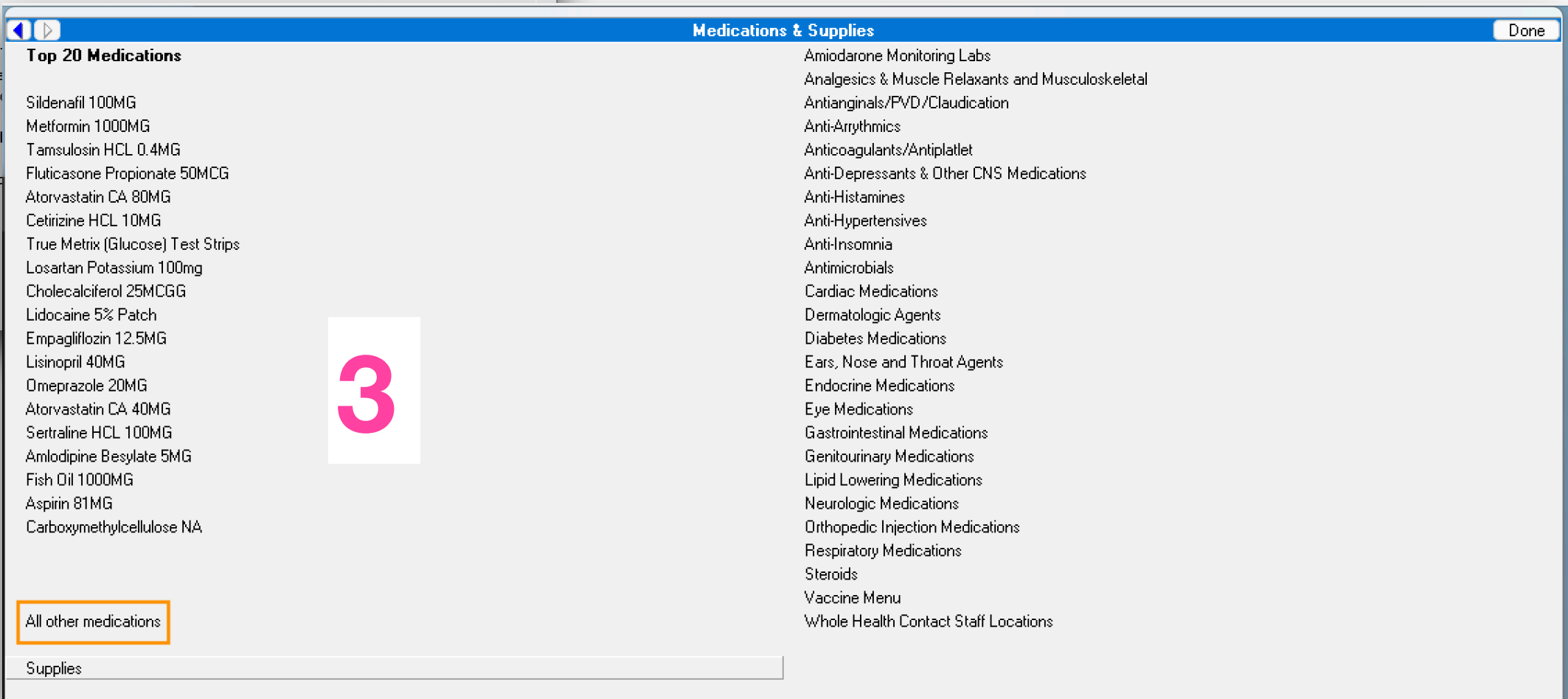
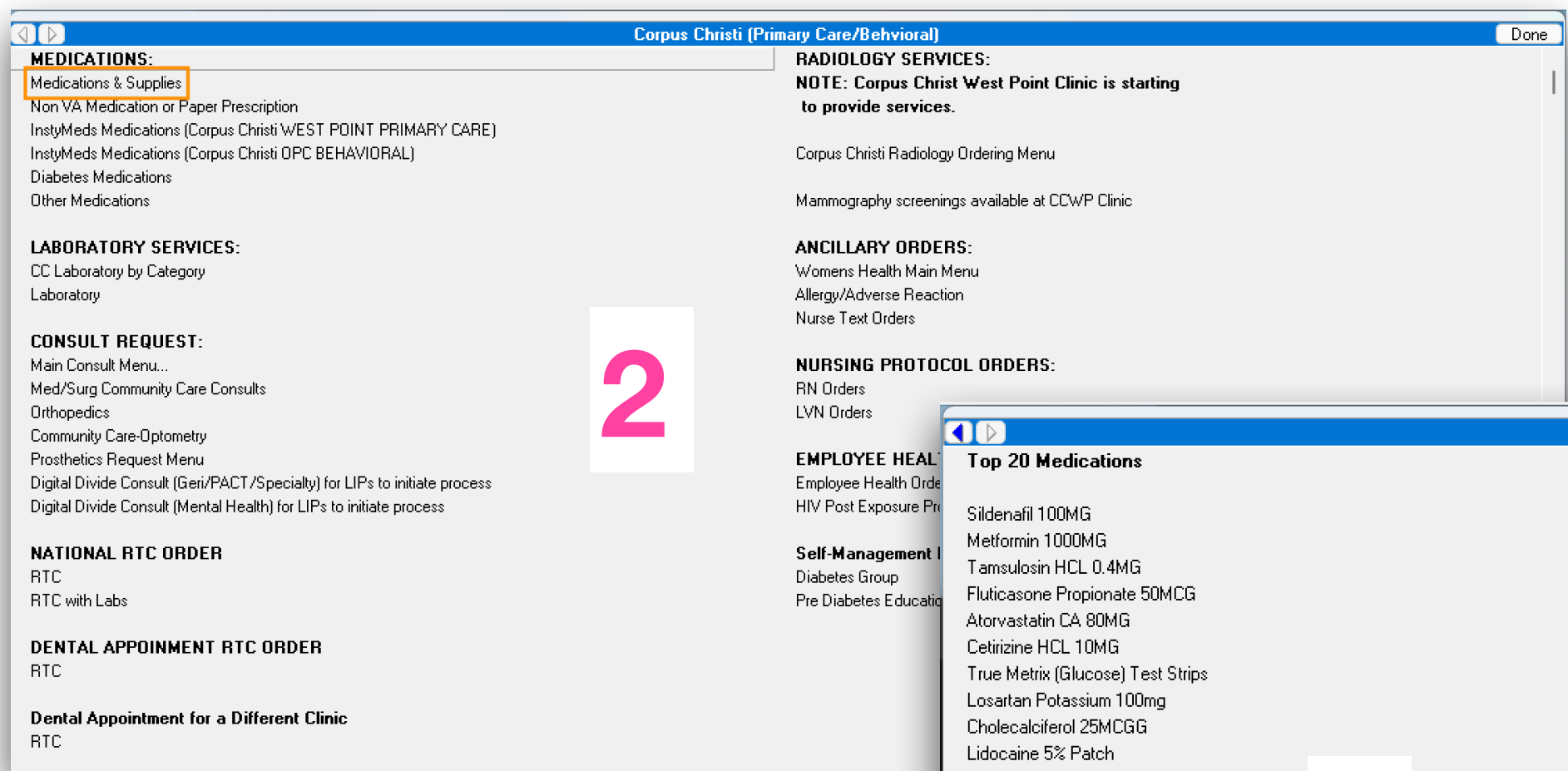
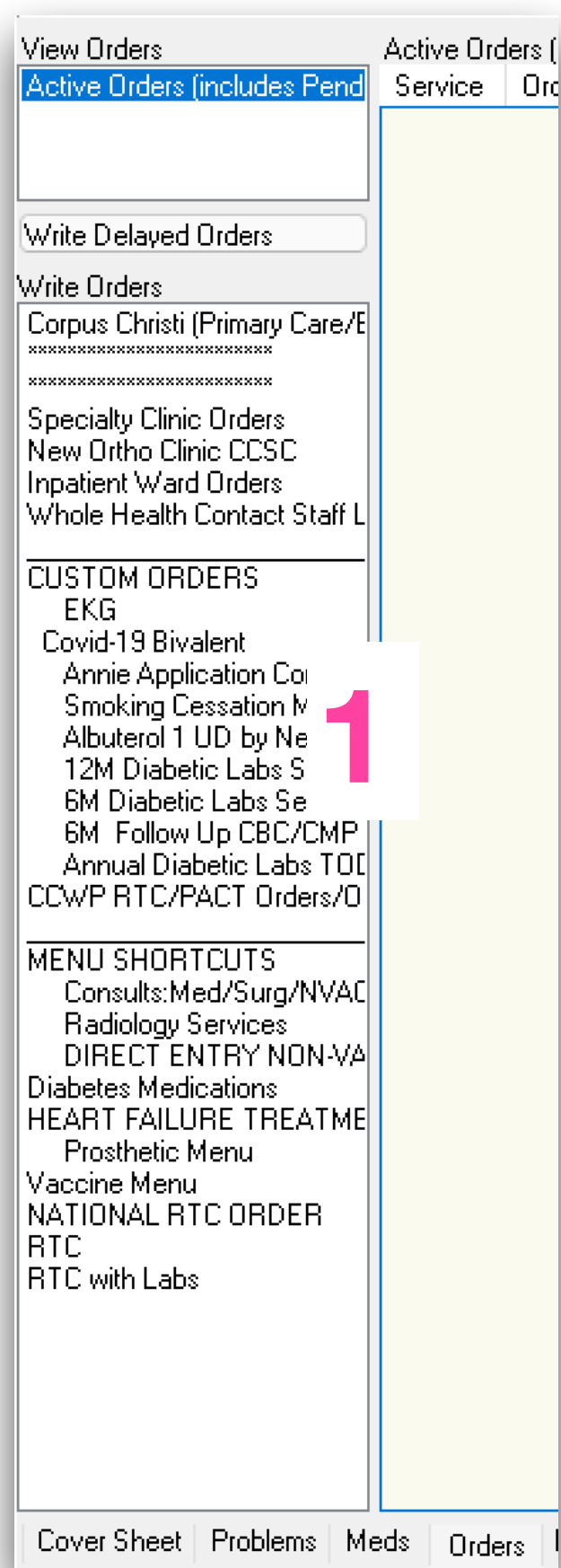
Accept Order

Providers must complete MRI screening in the order menu BEFORE requesting an exam. Any implantable device vendor/model must be included in history. STAT/ASAP CT/MR/US must be approved by Radiologist @ x63280 or x65540.

Example: Simple Order - Navigation x 3

Root Menu + 2 Nested Menus

- Corpus Christi Orders Side Menu (Root)
- Corpus Christi (Primary Care/Behvioral) [15831] (1)
 - Medications & Supplies [24371] (2)
 - All other medications [147] (ACTION)



Example: Simple Order - Actions x 4

One Search and then Three Details to fill in

1

Outpatient Medications

RSV VACCINE (ABRYSVO) INJ,LYPHL

(No quick orders available)

RSV VACCINE (ABRYSVO) INJ,LYPHL
RUXOLITINIB 1.5% CREAM, TOP NF
RUXOLITINIB <PADR> GROUP 9 (V17) TAB
RYBELSUS <SEMAGLUTIDE TAB > NF
RYBELSUS <PADR GRP 4> <SEMAGLUTIDE <PRIOR AUTH DRUG REQ> GRP 4 TAB >
RYBREVENT <PADR> VISN 17 <ENTRECTINIB <PADR VISN 17> CAP, ORAL > NF
RYTHMOL <PROPAFENONE TAB >
SACITUZUMAB <PADR> VISN 17 INJ
SACUBITRIL/VALSARTAN TAB
SALAGEN <PILOCARPINE TAB >
SALICYLIC ACID 17%/FLEXIBLE COLLOIDION SOLN, TOP
SALICYLIC ACID 3% SHAMPOO
SALICYLIC ACID GEL, TOP NF
SALICYLIC ACID PLASTER, TOP
SALICYLIC ACID/SODIUM THIOSULFATE LOTION NF
SALICYLIC ACID/SULFUR SHAMPOO
SALIVA, ARTIFICIAL SPRAY, ORAL
SALMET/FLUTICAS (ADVAIR) <PADR> GRP 5 INHL, ORAL
SALONPAS (REGULAR) <CAMPBOR/MENTHOL/METHYL SALICYLATE PATCH >
SALONPAS LARGE PATCH <CAMPBOR/MENTHOL/METHYL SALICYL LARGE PATCH >
SALSALATE TAB
SANCTURA XR <PADR> GRP 12 <TROSPIMUM SA <PADR> GROUP 12 CAP, EC >
SANDIMMUNE <CycloSPORINE (SANDIMMUNE) CAP, ORAL >
SANDOSTATIN <OCTREOTIDE INJ >
SANDOSTATIN DEPOT <OCTREOTIDE DEPOT INJ, SUSP, SA >
SANDOSTATIN LAR <OCTREOTIDE DEPOT INJ, SUSP, SA >
SANTYL <COLLAGENASE OINT, TOP >
SANUSI <PDMP-CONTROL MED> <SOLRIAMFETOL <PDMP-CONTROL MED> TAB > NF
SARILUMAB <PADR> GROUP 10 INJ NF

OK
Quit

2

Outpatient Medications

RSV VACCINE (ABRYSVO) INJ,LYPHL

Change

Dosage / Rate	Complex	Route	Schedule
0.5 ML RSV VACCINE LYPHL INJ		INTRAMUSCULAR	AS DIRECTED <input type="checkbox"/> PRN
0.5 ML RSV VACCINE LYPHL INJ	Tier 0	INTRAMUSCULAR INTRAVENOUS	2XMONTH 5XDAILY AC AC&BEDTIME AC&HS AS DIRECTED AT NOON AT BEDTIME BID BID WF BREAKFAST & SUPPER CONTINUOUS VIA PUMP DAILY DAILY WITH FOOD EVERY_6_WEEKS EVERY_OTHER_DAY EVERY_OTHER_WEEK HS(BEDTIME) INTRANASAL MEDROLDOS NOW ONCE PC

3

Indication:

FOR RSV PREVENTION

Comments:

4

Days Supply

30

Qty (V)

1

Refills

0

Pick Up

☒ Mail ☐ Window

Priority

ROUTIN

Accept Order

Quit

RSV VACCINE LYPHL INJ
INJECT 0.5 ML INTRAMUSCULAR AS DIRECTED
Quantity: 1 Refills: 0
Indication: FOR RSV PREVENTION

Example: Quick Order - Click and done

One click in the Menu and Done

Laredo Orders Side Menu (Root)
→ Laredo Clinic Orders [15832] (1)
→ InstyMeds Medications (Laredo) [21266] (2)
→ Tablet Cutter [21464] (ACTION)

See all these Quick Orders you can navigate to in Laredo

One click makes an order execute and complete

Example Significance:
Labs ordered at Omaha:
83% are Quick Orders

InstyMeds Medications (Laredo)

Done

Acetaminophen 500MG TAB Q6H PRN #100

Baclofen (Lioresal) 10MG TAB #45 (TID)

Baclofen (Lioresal) 20MG TAB #45 (TID)

Colchicine 0.6mg #6

Cyclobenzaprine 10MG TAB TID (15-day supply)

Diclofenac 1% Topical Gel 2gm QID #100gm

Diclofenac 1% Topical Gel 4gm QID #100gm

Ibuprofen 600MG TAB TID x 15 days

Ibuprofen 800MG TAB TID x 15 days

Lidocaine 5% Top Oint (Xylocaine) QD PRN #35gm

Lidocaine 5% Top Oint (Xylocaine) BID PRN #35gm

Meloxicam 7.5MG TAB DAILY x 15 days

Naproxen 500MG TAB BID x 15 days

Sumatriptan 50MG TAB AS DIRECTED (30-day supply)

Antibiotics & Antivirals

Acyclovir 800MG TAB #50

Augmentin 500/125MG TAB BID x 10 days

Augmentin 875/125MG TAB BID x 10 days

Amoxicillin 500MG CAP TID x 10 days

Azithromycin 250MG (Z-PACK DOSING) x 5 days

Bactrim DS/Septra DS TAB TID x 10 days

Cefdinir 300MG CAP BID x 10 days

Cephalexin 500MG CAP #30

Clindamycin 300MG CAP TID x 10 days

Clindamycin 300MG CAP #30 (QID)

Doxycycline 100MG CAP/TAB BID x 10 days

Fluconazole 150MG TAB DAILY x 1 day

Nitrofurantoin (Macrobid) 100MG CAP BID x 7 days

Oseltamivir (Tamiflu) 75MG CAP BID x 5 days

Anticoagulant & Antiplatelet

Apixaban (Eliquis) 2.5MG BID #30

Apixaban (Eliquis) 5MG BID #30

Clopidogrel 75MG TAB DAILY (15-day supply)

Behavioral Health

Buspirone 10MG TAB BID #20

Hydroxyzine (ATARAX/VISTARIL) 10MG #20/1 at Bed

Hydroxyzine (ATARAX/VISTARIL) 10MG #20/BID

Sertraline 25mg Daily #20 #15

Sertraline 50mg DAILY #10

Amlodipine 5MG TAB DAILY (15-DAY SUPPLY)

Furosemide 20MG TAB #15

Furosemide 40MG TAB DAILY (15-DAY SUPPLY)

Hydrochlorothiazide 25MG TAB DAILY (15-DAY SUPPLY)

Lisinopril 10MG TAB DAILY (15-DAY SUPPLY)

Losartan 50MG TAB DAILY (15-DAY SUPPLY)

Metoprolol Succinate (Toprol XL) 25mg

Metoprolol Succinate (Toprol XL) 50mg

Metoprolol Succinate (Toprol XL) 100mg

Metoprolol Tartrate (Lopressor) 50MG TAB #30

Midodrine 2.5MG TAB #45

Dermatologic

Clotrimazole 1% Topical Cream #30 grams

Hydrocortisone 1% Cream 28 grams

Mupirocin (BACTROBAN) 2% Ointment #22 grams

Diabetes

Empagliflo 12.5mg/Metformin 1000mg (Synjardy) 1 tab QC

Empagliflo 12.5mg/Metformin 1000mg (Synjardy) 2 tab QC

GLIPizide 10MG TAB #30

Metformin 1000MG TAB #30

True Metrix (Glucose) Test Strips #50

Insulin Syringe 0.5ML #10

Needle, Pen 31g, 8mm BID #25

Needle, Pen 31g, 8mm QID #25

GI

Famotidine 20MG TAB #30

Loperamide 2mg cap/tab #12

Omeprazole 20MG EC CAP #15

Ondansetron (ZOFran) 4MG TAB #30

Trazodone 50MG TAB QHS #15

Trazodone 100MG TAB QHS #15

Neurologic

Gabapentin 100MG CAP #45

Gabapentin 300MG CAP #45

Meclizine 25MG TAB #45

Ophthalmic

Ciprofloxin 0.3% OPH Soln #5ML (EYE)

Ketorolac 0.5% SOLN #5ML

Otic

Cortisporin Otic Soln #10ML (EARS)

Respiratory

Albuterol 90MCG ORAL INHL #1

Albuterol 0.083% Nebulizer INH 3ML #25

Azelastine 137mcg/Spray (Astelin) 200D Nasal INHL 1

Azelastine 137mcg/Spray (Astelin) 200D Nasal INHL 2

Benzonatate 100MG CAP #30

Cetirizine 10MG TAB #15

Fluticasone Nasal Spray 50MCG (BID) #16 grams (1 inh

Fluticasone Nasal Spray 50MCG (DAILY) 16 grams (1 in

Flut 250/Salm 50 Inhl, Oral (Wixela, Advair)

Ipratropium 0.03% Two Sprays Nasal BID #1

Medrol DOSEPAK (4MG TAB) #1 pk

Mometasone (ASAMANEX HFA) 200MCG/ACTUAT OF

Oxymetazoline (Nasal Afrin) 0.5% #30

Robitussin DM 120ml (10ml Q6h PRN)

Robitussin DM 120ml (5ml Q6h PRN)

Tiotropium 2.5MCG (Spiriva Respimat) #1

Urologic & Women's Health

Tamsulosin 0.4MG CAP #15

Ulipristal 30MG (Ella) #1

Tablet Cutter

Tablet Cutter

VAA Methodology

Five Steps

- **Non Invasive Capture** of VistA RPC traffic for a 30-day period of a VA Medical Center: Focus is on CPRS traffic
- **Workflow Extraction:** Sequences of extracted RPCs represent workflow
- **Workflow Categorization**
 - Example: 7 types of Radiology Study, Quick Orders, Explicit Orders, Order Sets, Verify only Orders within these types
- **Workflow Validation:** Use Emulator to reproduce examples of all types to validate completeness
 - Example screens seen earlier in this slide deck are from the Emulator
- **Generate Reports/Configurations** from Categorizations

Example sequence of
RPCs to Reduce

12	ORWDX DISMSG	
13	ORWDXM MENU	
14	ORWDXM3 ISUDQO	
15	ORIMO ISIVQO	
16	ORIMO IMOLOC	
17	ORWDXM3 ISUDQO	
18	OREVNTX1 ODPTEVID	
19	OREVNTX1 GTEVT	
20	ORWDPS2 QOGRP	
21	ORWDXM1 BLDQRSP	
22	ORWDRA32 LOCTYPE	
23	ORIMO IMOLOC	
24	ORWDPS1 CHK94	
25	ORWDXC ON	

VAA Year One

Current Status (5/25)

- Rounding out Order Workflow Representation
- Establishing Note Workflow Representation
- Reduce two more 30-day periods of data as final representative VAMC workflow - **both Omaha and Valley Coastal Bend (VCB)**

Deliverable

- Medical Center Workflow and Efficiency Reports in browsable and document form, including configuration file samples (CSV) for two representative VAMCs

VAA Year Two

9/25 to 8/26

- Extend VAA to provide comprehensive analysis and report of all ***Community Care workflows*** of a representative VAMC
- Extend VAA to provide comprehensive analysis and reports of all workflows of a ***VAMC that has migrated to EHRM***

VAA Year Two (Extended)

9/25 to 8/26

- Extend Workflow Modeling to include ***Community Care and Interfacility Consults Workflow*** (clinical workflow between VA Medical Centers and in the Community)
- Baseline Workflow Reports and Configurations for ***three to-be-migrated Medical Centers*** to enable EHRM migration and training
- Deliver VAA in Packaged form for use by third parties on ***all VA Medical Centers***