Session 62X
Driving Integrated Interoperability that Improves Clinical Efficiencies and Patient Safety

Presented by:
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Driving Integrated Interoperability that Improves Clinical Efficiencies and Patient Safety

Disclosure of Relevant Financial Relationships

The following faculty of this continuing education activity has no relevant financial relationships with commercial interests to disclose:

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Learning Objectives

• Understand how the Military Health System’s (MHS) business strategy is supported by MHS GENESIS

• Identify key upcoming functional community readiness activities in anticipation of Initial Operating Capability (IOC) go live

• Explore multidisciplinary projects that focus on improving the healthcare experience for patients, providers, pharmacists and nurses.

• Develop opportunities to modify existing solutions and host system interfaces to reduce the time and resources required for healthcare delivery.
Agenda

- Why MHS GENESIS
- The Role of the Functional Communities and Governance
- MHS GENESIS Rollout
- Review the Patient Healthcare Journey
- Introduce VHA Diffusion of Excellence
- Review KCVA Integrated Medication Management Platform components
- Summary

Change Management in the Military Health System: An MHS GENESIS (Cerner) Update
Why MHS GENESIS?

GENESIS is Critical to the Military Health Services’ Business Strategy

**Technology + People Enable Achievement of our Strategy**

- Defense Health Agency (DHA) is a point, integrated Combat Support Agency that enables the Army, Navy and Air Force medical services to provide a medically ready force and ready medical force to Combatant Commands in both peacetime and wartime.
- Technology provides the infrastructure needed to effectively execute our DHA goals.
- People execute technology – end user adoption is critical to the success of any technology we chose to implement.
- A “Ready Medical Force” includes people ready to execute the technology needed to meet the needs of those we serve.
MHS Genesis will Improve Quality of Services Provided

**Challenges**
- Globally disperse beneficiaries – many in remote locations
- Highly mobile beneficiaries and providers
- Separately managed Electronic Health Records (EHR) for each Service
- Approximately 50 legacy systems

**Solutions**
- **Integrated EHR, called MHS GENESIS**
  One system for all Services that can securely manage healthcare records in globally disperse locations
- **Joint Legacy Viewer (JLV)**
  Web-based, integrated system to access legacy data, and allow a read-only view of data from the Department of Defense (DoD) and Veteran Affairs (VA) systems

MHS Genesis will help MHS Become a High Reliability Organization (HRO)

Implementation of MHS GENESIS is a joint effort across the Services to operate more like an HRO to benefit both beneficiaries and operators of the EHR

**Benefits of MHS GENESIS**
- Better health record completeness
- Improved interoperability
- Reduced redundancies and costs
- Decreased potential for error in record sharing and reporting
- Simpler and safer transitions of care
- Easier access to health records for both beneficiaries and providers
- A proven product that is already functioning in the private sector

**Characteristics of an HRO**
- Consistently performs complex, high risk, and highly technical tasks under conditions of tight coupling and extreme time, with minimal to no error
- Three Critical Components:
  - Active leadership support
  - A culture of safety, where safety is owned by all
  - Robust process improvement methods
The Role of the Functional Communities and Governance

This is a Large-Scale, Multi-Faceted Business Transformation

Successful implementation of MHS GENESIS is dependent upon our ability to alter how we work together and think about our work.

- Individual ownership of the success of MHS GENESIS
- Leadership alignment among Army, Navy, Air Force, and DHA
- Adopt a “Power of One” mindset regarding how we work
- Functional support in the design and rollout of MHS GENESIS
The MHS GENESIS Guiding Principles are Our Roadmap to Success

- Standardize clinical and business processes across the Services and the MHS
- Design a patient-centric system focusing on quality, safety and patient outcomes that meet readiness objectives
- Flexible and open, single enterprise solution that addresses both garrison and operational healthcare
- Clinical business process reengineering, adoption, and implementation over technology
- Configure not customize
- Decisions shall be based on doing what is best for the MHS as a whole – not a single individual area
- Decision-making and design will be driven by frontline care delivery professionals
- Drive toward rapid decision making to keep the program on time and on budget
- Provide timely and complete communication, training, and tools to ensure a successful deployment
- Build collaborative partnerships outside the MHS to advance national interoperability
- Enable full patient engagement in their health

Functional Communities Have Made Significant Impact to Date

Using the Guiding Principles, the functional communities collaborated to develop enterprise-leading order sets and workflows to ensure a high quality of care across the Department of Defense
SMEs Across the MHS are Engaged to Ensure an *Enterprise* Solution

800 + Tri-Service subject matter experts are the voice of the functional communities providing expertise for:

- **Workflow Design**
  to develop standard workflows that leverage integrated functionality

- **Process Redesign**
  of clinical and business workflows outside MHS GENESIS

- **Standardization**
  of documentation, clinical hand-offs, paper forms, and protocols among the Services

- **Training Material Review**
  of over 140 training courses to ensure clinical content is accurate

- **Testing**
  of scenarios and scripts

- **Issue Resolution**
  as real-time questions and issues arise

MHS Functional Governance

![Diagram of MHS Functional Governance](image)
Cross Mapping of TSWAGS to IPTs

The 19 TSWAGs and Subsets of Care

<table>
<thead>
<tr>
<th>TSWAG</th>
<th>Analytics and Data Management</th>
<th>Clinical Support Services</th>
<th>Behavioral Health</th>
<th>Dentistry</th>
<th>Emergency Medicine</th>
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<td>Emergency Care/ Trauma</td>
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### The 19 TSWAGs and Subsets (cont)

#### TSWAG  
**Eye Care**
- Ophthalmology
- Optometry / OPAB

**Health Information Exchange (HIE)**
- ILV
- VLER

**Inpatient**
- Inpatient Ward
- Intensive Care Units

**Medical**
- Allergy / Immunology
- Cardiology
- Care Management
- Coumadin Clinic
- Dermatology
- Dialysis Center
- Endocrinology
- Executive Medicine
- Family Practice
- Gastroenterology
- Hematology-Oncology
- Hepatology
- Infectious Disease
- Immunization
- Internal Medicine
- Nephrology
- Primary Care
- Pulmonary
- Rheumatology

**Musculoskeletal & Rehab**
- Acupuncture
- Amputee Care
- Chiropractic Clinic
- Occupational Therapy
- Orthopedics
- Pain Management
- Physical Therapy
- Podiatry
- Prosthetics Orthotics
- Speech Therapy
- Traumatic Brain Injury

#### Subsets of Care

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<thead>
<tr>
<th>Operational Medicine</th>
<th>Patient Engagement</th>
<th>Pediatric</th>
<th>Public and Occupational Health</th>
<th>Research</th>
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The 19 TSWAGs and Subsets (cont)

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<td>Revenue Cycle</td>
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MHS GENESIS Rollout

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Expect a Standard Set of Activities During Rollout

IOC wave cycle is estimated to take 15 months. However, as MHS GEHESIS waves progress, the process will likely shorten due to lessons learned from prior waves.

Sustainment Support will be Available to You Post Go Live

- A variety of external and internal post go live support will be available to meet your individual needs
- External support will peak during the weeks following post go live and then gradually decline
- Internal support will remain on hand to assist end users
Key Takeaways

- **Infrastructure** – MHS GENESIS will provide the infrastructure necessary to better meet the needs of our global and highly transient beneficiaries and healthcare providers
- **The Power of One** – MHS GENESIS is an integrated EHR for all Services that will provide a more complete view of health records
- **Collaboration** – MHS GENESIS is a complex and long-term effort and success is highly dependent on the willingness of the Services to work together
- **Strategic Rollout** – The IOC wave is an important first step for charting the course of subsequent waves
- **Individual Ownership** – Take opportunities to learn about MHS GENESIS and actively participate if requested
- **Resources** – A variety of resource support will be provided post go live
Problem Statement at Kansas City VAMC

Despite several reports, studies and guidance documents released in the last 2 decades there continues to be a lack of integration between pharmacy dispensing technology, clinical surveillance, quality assurance reporting and smart IV pumps with the electronic medical records used by the healthcare system.

*Now is the time to ACT!*
Project Objective

Drive Integrated Interoperability that Improves:

- Clinical Workflow
- Operational Efficiency
- Patient Safety
- Patient Outcomes

Who suffers from ineffective information sharing in a Healthcare System:

- Patients
- Providers
- Clinic Staff
- Pharmacy
- Nursing
- Healthcare Systems
- Third Party Insurers
- Retail Pharmacies
- Provider owned clinics
- ANYONE that pays for patient care
VHA Access to Care

Example of Predicted Access Improvement:

Current State

Future State

Visits Per Year Per PACT Teamset

3120

> 5120

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VA Diffusion of Excellence

Established the Promising Practices Consortium and Diffusion Council.

VHA stood up a community to promote promising practice sharing between facilities and the diffusion of best practices, including a Diffusion Council governance process.

Facilitating the Diffusion of Gold Status Best Practices:

The finalists were further narrowed to 13 Gold Status Best Practices, which will be replicated in VA health care facilities across the system.

Establishing a Sustainment Strategy:

VA will establish a mechanism for incentivizing and institutionalizing the identification and diffusion of practices nationwide so that every facility has the opportunity to implement the solutions that are most relevant to them.

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VA Diffusion of Excellence

Increasing Access to Primary Care with Pharmacists
Clinical Pharmacists play a larger role in the Care Team, helping Primary Care Providers support patients and increase Veterans’ access to care.

- PACT CPS Chronic Disease Clinics: 13.8% ↑ in clinic utilization
- PACT Team Integration: Enhanced communication and increased morale
- New patient calls: saved PCPs 20 minutes on average for every new patient
- Converting PCP visits to PACT CPS Resulted in: 27% PCP appointments converted 16.5 hours newly opened access = 66 new telephone appts or 33 new F2F appts

Population Management in PACT
Population Surveillance: Old vs New

**OLD**
"Demolition Derby"

**NEW**
"Autonomous Driving"

Rules Engines: Old vs New

**OLD**

**NEW**
Who suffers from ineffective information sharing in a Healthcare System:
Now is the time for disruption

- Point of care devices alone are NOT sufficient.
- Workflow is a key component population management
- MedMined is MORE than an alerts tool.
- There are new and existing RPC and HL7 interfaces recently exposed with VistA
- This is a GUI on top of VistA, not an expensive new pharmacy information system.
- Multiple software, why is this good?
  - SSO and CCOW allows seamless transitions
  - Enables vendors to focus on what “THEY DO BEST”
  - Leverage high quality, timely vendor support and requires only 2 RSS ISA/MOU’s that are already in place
- New enterprise opportunities with MS Azure and “cloud” based solution platforms
- We can begin to phase in NOW
- Demonstrate value to ALL healthcare “teams” and “providers”
  - Provide ROI for pharmacists in private clinics and teams
  - Improve workflow to reduce healthcare expenditures
  - Improve Medicaid and Third Party reimbursement
  - Enable “enterprise” or “regional” patient care and telehealth

MedMined: Care Transitions

Medication Reconciliation
Population Surveillance
PACT Team Workflow
Population Management

Medication Reconciliation
Inpatient Pharmacy Workflow
Order Entry and Verification
Intervention Alert and Documentation
### PACT Appointment Matrix Visualization

![PACT Appointment Grid]

### CHF Readmission Risk Report

Number of Patients: 283

![CHF Readmission Risk Report]

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MedMined Dashboard

MedMined Alert Management
What happens now?

- REAL TIME ACTIONABLE DATA SOURCE AGNOSTIC POPULATION MANAGEMENT TOOLS!
- We must continue development of ScriptPro PPM/SPCg, MedMined Care Transitions and BD Knowledge Portal.
- Patient Will Call Dispensing Systems
  - Pharmacy Kiosks for Patient Queuing and Pick Up
  - Patient Facing Will Call Dispensing “Window”
- Medication Management and Disease State Monitoring
  - Continual Medication Reconciliation including outside prescriptions
  - OSI, Antimicrobial, Metrics and etc real time monitoring and alerting
  - Set time based alerts, reports and notifications for defined follow up labs and procedures
  - Incorporate into AudioCare Disease State Manager
- Assist in VA Innovations Solutions

KCVA Smartworks: The time has come.

- MedMined and Knowledge Portal are the “GUI” and trans-analytics engine
- Pyxis ES is the point of care assistant
- Pharmogistics is the supply chain and efficiency/inventory cost manager
- MedMined is the engine for rules based workflow and efficiency
- BD Cato and Alaris are the IV workflow and safety managers
- MedMined is the Pharmacy System GUI for inpatient (ScriptPro Outpatient)
- MedMined is the Medication Reconciliation Transitions of Care Platform
- Unified Formulary enhances healthcare system standardization
  - VHA = PPS-N (First Databank GOTS)
  - VHA Order Checks = MOCHA (FDB GOTS)
  - VHA PADE = Real-time Local Drug File updates and scan codes
- ENTERPRISE, ENTERPRISE, ENTERPRISE: VHA FEDERAL MS AZURE and TRM! Bring up sites as iterations, not new systems.
Lifecyle of a Medication Order

Pyxis ES Server:
Web client (NOT free standing console)

- Active directory setup and "remote" user management and supports strong password
- Can access system from ANY workstation by a hyperlink
- Load, pend refills, view inventory from ANY workstation
- Upgrades will NOT need any Pyxis medstation "top swaps".
Pyxis ES: User Interface

- Patient centric, not action centric
- Tested on VHA Class 1 PADE Interface
- New user interface and uses Active Directory
- Better reporting
- Allows for printing labels
- Enables medication and patient global search

Pyxis Link: Web client available on any nurse workstation

- Remote Medication Queueing to Pyxis station
- Improved Views (filters) for nurse workflow
- Remote waste documentation
- Pyxis stock indicator and station availability
- Reduce nursing calls to pharmacy and missing dose requests
Pharmogistics: Web client Inventory Management (Carousel)

- Web client access from any workstation with Pharmogistics Shortcut
- Closed chain inventory management system
- Automatic EDI order and receipt of McKesson and other vendor orders
- Fully integrated into Pyxis, Knowledge Portal and will be integrated with BD Cato and other products

Pharmogistics: Web client Inventory Management (Carousel)

- Manage Missing doses, Pre-exchange doses and Pick List
- Request medication for Outpatient Pharmacy or other storage area using hyperlink Web Form from any workstation or filling station
- Highly customizable prioritization of transactions
Alaris Interoperability

Alaris: IV Therapy Management

- 30% less discrepancy messages, improving RN efficiency
- 22% reduction in infusion pump alerts
- 33% decrease in cancelled infusions

Knowledge Portal and MedMined

1. Research and academic achievement increases productivity. (Ralph W., Jr., MD, PhD, 2002). Implementation of a knowledge management system between the radiation oncology and medical informatics programs. (J. V). Improves healthcare.
Background

• There are many studies that have demonstrated the risk of medication misadventures with IV medication administration. Intravenous infusion IV pumps have attempted to control these risks by implementing “smart” IV pumps.
• At this time the “smartest” IV pump in the VHA and most other institutions still require human programming and manual selection of a drug to be infused from a drug library on the pump.
• Some risk has been averted however there continues to be a high rate of infusion related medication errors.

Review of Literature

• From 2005 to 2009 the FDA received approximately 56,000 reports of adverse events associated with IV pumps. In 2010 the FDA took measures to proactively facilitate device improvement and publish new guidance for the industry. The advent of smart pump drug libraries and MIN/MAX rate and dosing limits has introduced some improvement however these are often bypassed and there is still a significant number of adverse events reported annually.
• The ISMP released guidelines in 2009 stating that a desirable functionality of smart IV pumps is “Wireless technology that can integrate with computerized prescriber order entry (CPOE), bar-code medication administration (BCMA), and electronic medication administration record systems”.

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Alaris Infusion BCMA (iBCMA)

Infusion BCMA Supported Devices

**BD CareFusion Applications** supports:

- Motorola MC40
- Motorola MC75A

**BD CareFusion Web Client** supports:

- Laptops
- Mobile Workstations
- Standard Workstations
BD Cato: IV Admixture Management

8.4% of adverse events associated with compounding errors result in death\(^2\)

30% of hospitals have experienced a patient event involving a compounding error in the last 5 years


BD Cato: IV Admixture Management Workflow Queue
Summary

- The implementation of these tools seamlessly integrate all aspects of medication distribution, administration and clinical decision alerting and management. The use of BD (Carefusion) SmartWorks suite of applications with VistA interfaces will:

1) Increase nursing visibility to medications distribution
2) Improve pharmacy’s efficiency in maintaining and distributing patient IV’s
3) Unify communication, alerting and management of patient events/therapy
4) Improve accuracy of IV medication administration
5) Force standardization of IV medication administration
6) Provide direct BCMA to IV Pump Programming
7) Enable Providers and Pharmacy view of infusion actions in BCMA/CPRS
8) Enable Dynamic Alert Management and Reduced Alert Overload
9) Provide real time quality, safety, monitoring and workflow reporting
10) Improve efficiency of pharmacy and nursing medication chain
11) Integrate IV flow sheet data into CIS/ARK
12) Provide IV pump flow sheet data and alert documentation into CPRS
Unify

Patient Journey

Knowledge Portal | MedMined | Med Viewer | Smartworks
ES Track & Deliver | Anesthesia ES | MedStation ES
Use Reporting | Care Transitions Monitoring | Infection Prevention and Pharmacy Surveillance

Automation

Emergency Room
Diagnostic Laboratory
Hospital Pharmacy
Acute Care
Care Outside the Hospital
Transitional Care
Community (home/outpatient)

Unify

Outcomes Efficiency

Primary Care Physician

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Faculty Biography & Contact Info

Dr. Schaefer, Pharm.D. is the Clinical Informatics Pharmacist at the Kansas City VAMC and is a member of many national and regional informatics and clinical committees and advisory boards. He is AMIA VA Health Informatics 10x10 certified, a current member of the Federal Pharmacy Executive Steering Committee Informatics Subcommittee and is involved with developing and implementing many local and national innovations projects.

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