Military Health System Opioid Registry

Session 210, March 8, 2018

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Speaker Introduction

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Conflict of Interest

Chris E. Nichols, MHA, BSN, LSSBB
Christopher Spevak, MD, MPH, JD
Neither speaker has any real or apparent conflicts of interest to report.
Agenda

• Introduction
• Opioid Epidemic Background
• Clinical Relevance
• Enterprise Intelligence and Data Solutions (EIDS) Overview
• Evolution of the Military Health System Opioid Registry
• Components of the Learning Health System (as it relates to MHS Opioid Initiatives)
• Questions
Learning Objectives

• Describe the impact of the opioid epidemic within the Military Health System (MHS) and summarize current opioid safety initiatives

• Define the components of a military learning health system and identify areas for collaboration and integration

• Discuss and evaluate the development and use of the MHS Opioid Registry in combatting the opioid epidemic

• Debate and assess the use of clinical registries as an integrated part of the clinical workflow to improve clinical outcomes
Problem

• 42,000 deaths involving opioids in 2016 - Center for Disease Control and Prevention (CDC)
  – 28% increase from 2015
  – Synthetic doubling from 2015 (9,580 to 19,413)

• 2.4 Million Americans have Opioid Use Disorders (OUD) – Substance Abuse and Mental Health Services Administration (SAMHSA)

• The opioid abuse crisis cost the US economy an estimated $504 billion in 2015 White House (WH)
Overdose Deaths: Age

Figure 2. Drug overdose death rates, by selected age group: United States, 1999–2016

1Significant increasing trend from 1999 to 2016 with different rates of change over time, p < 0.005.
22016 rate was significantly higher than for the rate for age groups 15–24, 55–64, and 65 and over, p < 0.05.

NOTES: Deaths are classified using the International Classification of Diseases, Tenth Revision. Drug-poisoning (overdose) deaths are identified using underlying cause-of-death codes X40–X44, X60–X64, X65, and Y10–Y14. Access data table for Figure 2 at: https://www.cdc.gov/nchs/data/databriefs/db294_table.pdf#2.
Overdose Deaths: Opioid

Figure 4. Age-adjusted drug overdose death rates, by opioid category: United States, 1999–2016

Deaths per 100,000 standard population

1Significant increasing trend from 1999 to 2016 with different rates of change over time, p < 0.05.
2Significant increasing trend from 1999 to 2006, then decreasing trend from 2006 to 2016, p < 0.05.
NOTES: Deaths are classified using the International Classification of Diseases, Tenth Revision. Drug-poisoning (overdose) deaths are identified using underlying cause-of-death codes X40–X44, X60–X64, X85, and Y10–Y14. Drug overdose deaths involving selected drug categories are identified by specific multiple-cause-of-death codes: heroin, T40.1; natural and semisynthetic opioids, T40.2; methadone, T40.3; and synthetic opioids other than methadone.
Deaths involving more than one opioid category (e.g., a death involving both methadone and a natural or semisynthetic opioid) are counted in both categories.
Percentage of drug overdose deaths that identified the specific drugs involved varied by year, with ranges of 75%–79% from 1999 to 2013, and 81%–87% from 2014 to 2016. Access data table for Figure 4 at: https://www.cdc.gov/nchs/data/databriefs/db294_table.pdf#4.
Oxycodone Consumption

Despite a decline in recent years, U.S. per capita opioid consumption remains much higher than oxycodone consumption in Europe.

Source: The International Narcotics Control Board
New Persistent Opioid Use After Minor and Major Surgical Procedures in US Adults

- Retrospective study of opioid naïve adults who underwent either a major or minor surgical procedure found significant opioid use persisted three to six months after surgery among 6.5 percent and 5.9 percent of patients, respectively.

- Examination of the risk factors for ongoing use revealed no statistically significant correlation with procedure type but a strong association with patient factors such as anxiety and depression, and a connection between the amount of opioid prescribed and eventual long-term use—all pointing toward an iatrogenic cause of the longer-term dependence.

- 15 percent of patients screened for study inclusion did not fill an opioid prescription 30 days prior or 14 days after surgery, suggesting alternative treatments are likely an option for many patients.

Opioid Prescribing Patterns of Emergency Physicians and Risk of Long-Term Use

• Wide variation in rates of opioid prescribing existed among physicians practicing within the same emergency department, and rates of long-term opioid use were increased among patients who had not previously received opioids and received treatment from high-intensity opioid prescribers.
Enterprise Intelligence and Data Solutions Overview
**Mission:** To support MHS strategic goals and facilitate informed decision-making through the delivery of robust information services and data in a timely, relevant, and actionable manner.

**EIDS Solution Layers**

- **Presentation**
  - Predictive, diagnostic, and descriptive tools for information delivery
  - Includes: CarePoint information Portal, dashboards and reporting services, and external apps

- **Logic**
  - Data transformation to deploy data virtualization and develop BI strategy and define analytics toolkit
  - Includes: Virtual Data/SOA/APIs, Business Rules Engine, Routes in the ESB

- **Data**
  - Single source for secondary data use to facilitate DHA Information and discover/define patterns in enterprise data
  - Includes: Infrastructure, data, and data marts

The Enterprise Intelligence and Data Solutions (EIDS) PMO was established within the Solution Delivery Division (SDD) of the Defense Health Agency (DHA) to help execute the DHA Data Vision of providing seamless data services and decision support for clinicians, patients, beneficiaries, analysts, researchers, and DoD leadership.
EIDS oversees a number of program activities to bring together **data, information technology, and data science**, delivering analytics-driven insights for customers.

### Data System Assets (Data)
- Consolidate data warehousing for legacy systems such as AFCHIPS, COHORT, and other cached data sources
- Strategize a legacy data repository to archive clinical and business data as MHS GENESIS is rolled out to Military Treatment Facilities (MTFs)

### Delivery Platforms (Information Technology)
- Offer and maintain a suite of data tools including the CarePoint Application Portal for business intelligence, customer reports, and decision support
- Provide data science support for tools such as SAS, Enterprise Miner, STATA, AsterData, Python, R, Tableau, and SEMOSS

### Domain Expertise (Data Science)
- Provide expertise from a team of highly trained Data Scientists, Informaticists, Epidemiologists, Biostatisticians, Health Services Researchers, Mathematicians, Data Modelers and Architects, ETL Developers, Database Administrators, and Business Intelligence Developers with advanced analytical skills

**Program Management Activities**
- Project Management
- Contract Support
- Engineering
- Technical Requirements
- Information Assurance
- Procurement
- Network, Hosting, and System Administration
- Software Licensing
- Hardware Licensing
- DoD CIO Alignment
Opioid Challenges: Multifactorial Approach Needed

Institute of Medicine (IoM) definition of learning health system:

“science, informatics, incentives, and culture are aligned for continuous improvement and innovation, with best practices seamlessly embedded in the delivery process and new knowledge captured as an integral by-product of the delivery experience.”
Opioid Use Case

Ask

Study

Act

Manage

Data and Registries

Collaborative Research

Data Discovery and Analytics

Measure

Reporting and Evaluation

Clinical Decision Support

Pharmacy/Opioid metrics - Dec 2017?

Ft. Carson
Morphine Equivalence Daily Dose (MEDD)
pre/post analysis

Jun 2015 - Feb 2016

Nov 2016

Dec 2016

#HIMSS18

CHIMSS 2018
Data Discovery

Used variety of machine learning methods to predict whether patient is a high opioid user

• Built prediction models on training dataset (observation period 2006-2012)

• Tested prediction models on testing dataset (observation period 2013-2014)

• Reported predictive measures based on test data
Collaborations

- National Capital Region
- Military Treatment Facilities (MTFs)
- VA Pharmacy and Mental Health
  - Opioid Therapy Risk Report tool (OTTR)
  - VA STORM
- DoD Pharmacy Operations Division (POD)
- DoD Pharmacy, Pain, Primary Care, Mental Health SMEs

Research

- Opioid/Benzodiazepine Concurrence Reduction Intervention Study
- Outcomes studies (Reduction of opioid induced respiratory depression)
- Predictive Risk scores of opioid misuse and suicide ideation
- Validation of Risk Index for Overdose or Serious Opioid-Induced Respiratory Depression (RIOSORD) in the DoD population
Data and Registries

- States currently rely on prescription drug monitoring programs (PDMP)
- Developed MHS Opioid Registry (reusing Carepoint platform) in < 1 year
- Data extracted for registries: Over 200+ variables including:
  Demographics, Medications, Prescriber, MTF Restrictions, Urine Drug Testing, Healthcare Utilization Factors, Co-morbidities, Opioid Risk Factors, Naloxone, RIOSORD, Patient Health Questionnaire -9 (PHQ-9)
- Proactive monitoring of patient and physician prescribing behavior
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**Active Benzo:** Yes
**Active Opioid:** Yes
**High Risk Opioid:** No
**Concurrent Opioid Benzo:** Yes
**Concurrent Opioid Benzo (Days):** 52
**Current Methadone Rx:** No
**Current Long Acting Rx:** No
**Current Fentanyl Patch Rx:** No

**Active Benzo:** Yes
**Active Opioid:** Yes
**High Risk Opioid:** No
**Concurrent Opioid Benzo:** Yes
**Concurrent Opioid Benzo (Days):** 46
**Current Methadone Rx:** No
**Current Long Acting Rx:** No
**Current Fentanyl Patch Rx:** No

**Active Benzo:** Yes
**Active Opioid:** Yes
**High Risk Opioid:** No
**Concurrent Opioid Benzo:** Yes
**Concurrent Opioid Benzo (Days):** 68
**Current Methadone Rx:** No
**Current Long Acting Rx:** Yes
**Current Fentanyl Patch Rx:** No

**Active Benzo:** Yes
**Active Opioid:** Yes
**High Risk Opioid:** No
**Concurrent Opioid Benzo:** Yes
**Concurrent Opioid Benzo (Days):** 68
**Current Methadone Rx:** No
**Current Long Acting Rx:** Yes
**Current Fentanyl Patch Rx:** Yes
Clinical Decision Support

- Patient lookup feature – Pharmacists have ability to scan ID cards and view patient opioid risk factors. Can distribute Naloxone as needed
- Could be expanded to Primary Care, Mental Health, Pain, and other specialties
- Screen for opioid-related outcomes (e.g. risk of respiratory depression)
- Screen for mental health disorders and other comorbidities
- Potentially support transition of care activities from DoD to VA
Reporting and Evaluation

- Ongoing development of 5-10 pharmacy measures. Based off of standards (e.g. Pharmacy Quality Alliance)
- Pre/post analyses of interventions and policy (e.g. Army Naloxone distribution policy)
- Development of Tableau reports:
  - # of opioid, Naloxone Rx filled
  - how many and what percent of unique patients who received an opioid also had an opioid-induced respiratory depression (OIRD) Score >31
Future – “Predictive” Opioid Registry

• Safe opioid prescribing and early detection of opioid misuse
• Identification of patients on opioids and MEDD monitoring
• Expansion to report data related to clinical diagnoses/comorbidities, healthcare utilization, and individual patient factors
• Risk stratification using flagging and predictive risk scoring
• Proactive management and detection of those at risk for suicide events and substance abuse
• Incorporate VA STORM risk score to expand registry’s use for transition of care activities
• Evaluate and track alternative non-opioid therapies for pain management
Acknowledgements

- EIDS PMO data scientists
- Collaborators
  - National Capital Region Pain, MTF contributors, DHA Pharmacy Operations Division, Army Pharmacy
- Non-DoD partners
  - VA, UT Health-San Antonio
- Carepoint MHS Population Health Portal (MHSPHP) Users
Questions?

• Please complete online session evaluation. Thank you!

• For more information, please contact:

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