Population Health in the Military Health System

By David Carnahan, MD, MSCE & Susan Chao, MS

Session Objectives

1. Describe the Military Health System (MHS)
2. Review Features of MHS Population Health Portal
3. Showcase Success Stories
4. Share Lessons Learned
Military Health System Overview

- 55 Military Hospitals
  - Academic
  - Community
  - International
  - Combat Areas
- 373 Medical Clinics
  - All Specialties
  - International
  - Combat Areas
- 245 Dental Clinics
  - International
  - Combat Areas


Military Health System Overview

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Direct Care</th>
<th>Purchased Care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Week</td>
<td>Year</td>
<td>Week</td>
</tr>
<tr>
<td>Hospitalizations</td>
<td>20,000</td>
<td>1,045,000</td>
<td>4,800</td>
</tr>
<tr>
<td>Births</td>
<td>2,300</td>
<td>119,000</td>
<td>900</td>
</tr>
<tr>
<td>Clinic Visits</td>
<td>1.3 M</td>
<td>70 M</td>
<td>752,000</td>
</tr>
<tr>
<td>Prescriptions**</td>
<td>2.4 M</td>
<td>128 M</td>
<td>889,000</td>
</tr>
</tbody>
</table>

**Mail Order Pharmacy: 490,000 week, 25.5 M annually
MHS Review

- Secretary of Defense recommends ‘Performance Management System’
- Services agree on Partnership for Improvement (P4I)
- Virtuous Cycle of Improvement

The Virtuous Cycle

- Measure
- Prioritize
- Execute

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Prioritize

MHS DASHBOARD - NAVY

Reduce Patient Harm
- CABC: Jan '16
- UNCD: Jan '16

Improve Outcomes for Condition Based Quality Care
- HEDS: Diabetes
- Acute Conditions

Learning Health System

Business Intelligence
Data Science Analytics

Operational Analytics
Research

Population Health Registries
Clinical Decision Support

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Strategy to Execution

On-Time Departure

Strategic Target

Operational Target

Simple Execution

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Spotlight # 1

“One of the key components of the patient centered medical home (PCMH) model is preventative health screenings. The MHSPHP stream lines the data in a way that makes the information readily available to the care team, cutting down the time searching through the patients medical record in order to find the data and most importantly ensures that we are providing our beneficiaries with the highest quality care possible ...”

Translation Process

Strategic

1. Good Data
2. Segmentation
3. Differentiation
4. Prediction
5. Automation

Tactical
Complex Execution

*High risk admissions that need primary care follow-up to reduce readmissions*

- **Exploratory**
  - Age
  - Chronic Condition
  - LOS
  - Gagne Score
  - Primary Care F/U
  - RUB
  - DRG Group
  - ICU Stay

- **Predictive**
  - Age
  - Chronic Condition
  - Gagne Score
  - RUB

- **Prescriptive**

**16% of Admissions**

**40% of Readmissions**

**Comparative Effectiveness Studies**

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Readmissions

<table>
<thead>
<tr>
<th>Admission</th>
<th>Discharge</th>
<th>30 Days After Discharge</th>
</tr>
</thead>
<tbody>
<tr>
<td>No apt</td>
<td>Appt Sch</td>
<td>Appt Kept</td>
</tr>
<tr>
<td>No apt</td>
<td>Appt Sch</td>
<td>Not Kept</td>
</tr>
<tr>
<td>No apt</td>
<td>Appt Sch</td>
<td>R</td>
</tr>
</tbody>
</table>

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Dynamic Registry

Spotlight # 2

“We rely on the MHSPHP DAILY! The way it lists, sorts and filters the patient data is indispensable. We have our entire team using this database to track our patients. We have statistically improved our patient’s care because of this oh-so-important tool. And the fact that it’s constantly updating and improving only adds to its immense value. We can’t live without it!”
Filter

Filter Results

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Filter Results

<table>
<thead>
<tr>
<th>Enrollment Status</th>
<th>Overdue Due</th>
<th>ALC RESULT</th>
<th>Appt Date</th>
<th>Appt Time</th>
<th>Appt Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>10.2</td>
<td>11/12/2016</td>
<td>11/12/2016 01:17</td>
<td>EROOM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14.5</td>
<td>11/12/2016</td>
<td>11/12/2016 08:27</td>
<td>EROOM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10</td>
<td>11/12/2016</td>
<td>11/12/2016 09:39</td>
<td>EROOM</td>
</tr>
</tbody>
</table>

Metadata Tagging

Add / Remove Patient Tags

- Add Tags
- Remove Tags

Add Existing Tags

Create New Tag

Uncontrolled Diabetic

Private Tag

Tag Description (optional)
Spotlight # 3

“Working with my command’s Population Health Coordinator, we used the MHSPHP to identify patients who failed to meet the metric and attempted to determine what could have been done differently. Using this information, we formulated a successful action plan to improve mental health outcomes. It would not have been possible to do this kind of deep-dive analysis without the high level functionality of MHSPHP.”

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>72.73%</td>
<td>73.83%</td>
<td>67.11%</td>
<td>62.34%</td>
<td>55.13%</td>
<td>65.88%</td>
<td>67.65%</td>
<td>65.48%</td>
<td>74%</td>
<td>75.79%</td>
<td>75.55%</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>82.05%</td>
<td>81.68%</td>
<td>84.09%</td>
<td>82.40%</td>
<td>83.46%</td>
<td>84.13%</td>
<td>81.89%</td>
<td>82.35%</td>
<td>81.90%</td>
<td>86.61%</td>
<td>85%</td>
<td>84.27%</td>
</tr>
<tr>
<td>2016</td>
<td>75.93%</td>
<td>71.36%</td>
<td>75%</td>
<td>76.47%</td>
<td>75.25%</td>
<td>77.32%</td>
<td>79.41%</td>
<td>85.86%</td>
<td>85.58%</td>
<td>84.69%</td>
<td>89.47%</td>
<td>91.95%</td>
</tr>
</tbody>
</table>
# Registry Flexibility

## High Risk Conditions (PVX)
- Elderly >= 65
- Organ Transplant
- HIV
- Chronic Renal Failure
- Nephrotic Syndrome
- Leukemia
- Lymphoma
- Hodgkin Disease
- Multiple Myeloma
- Generalized Malignancy
- Asplenia
- Sickled Cell Disease
- Hemoglobinopathy

_Could you get this information in minutes if you asked for it? How long would it take to get this to the clinicians at point of care?_

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# Adjusted Clinical Groups

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*Data Analysis*
ACG creates a coordination risk marker by using an algorithm of several other markers that are outlined here. You can see how a combination of these markers would help identify individuals who might be at significant risk for coordination issues—such as the person who has not seen their generalist in the past year, but has seen many other physicians to include a high number of specialists. The other factor labeled majority source of care really is a marker that gives an idea of how well one provider knows the patient. This would be the person who has seen the patient the majority of the time. If MSOC is lower than 29%, then there is a good chance no one really knows that patient.

Here is an example to help you see pragmatically who some of these markers are derived—on the left, we have a patient who has seen their generalist 6 visits and specialists 7 visits, which results in an MSOC of 63% and a MSOC of 20% with no specialists seen and no generalists seen. On the right, we have a patient who has seen their generalist 8 visits, who has seen specialists 2 visits, and has seen only one provider, which results in an MSOC of 80%.
11/28/2016

Cost of Poor Coordination

The Impact of Poor Coordination
### Immunizations Registry

**Immunizations Registry**

Facility: AMC BAMC-FS

Enrollment data current as of 11/22/16; Monthly maintenance registry patients current through 08/31/16; ACO/Health Services encounters through 08/31/16; [No filter criteria applied]

<table>
<thead>
<tr>
<th>ACG RUB</th>
<th>ACG RIM</th>
<th>ACG Date</th>
<th>Birth Month</th>
<th>Age</th>
<th>Gender</th>
<th>ItemCat</th>
<th>Last PCV</th>
<th>Last Fl</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>0.09</td>
<td>10/1/16</td>
<td>11</td>
<td>7</td>
<td>M</td>
<td>ADFM/LY</td>
<td>2012-12-12 (B)</td>
<td>2015-1</td>
</tr>
<tr>
<td>Healthy</td>
<td>0.07</td>
<td>10/1/16</td>
<td>7</td>
<td>6</td>
<td>F</td>
<td>ADFM/LY</td>
<td>2011-07-22 (B)</td>
<td>2015-1</td>
</tr>
<tr>
<td>Moderate</td>
<td>0.44</td>
<td>10/1/16</td>
<td>9</td>
<td>9</td>
<td>M</td>
<td>RTFM/LY</td>
<td>2013-11-01 (B)</td>
<td>2015-1</td>
</tr>
<tr>
<td>Moderate</td>
<td>0.38</td>
<td>10/1/16</td>
<td>11</td>
<td>23</td>
<td>F</td>
<td>ADFM/LY</td>
<td>2016-06-01 (B)</td>
<td>2015-1</td>
</tr>
<tr>
<td>Moderate</td>
<td>1.43</td>
<td>10/1/16</td>
<td>7</td>
<td>80</td>
<td>F</td>
<td>RTFM/LY</td>
<td>2015-06-01 (B)</td>
<td>2015-1</td>
</tr>
<tr>
<td>Very High</td>
<td>5.30</td>
<td>10/1/16</td>
<td>7</td>
<td>87</td>
<td>M</td>
<td>RTA</td>
<td>2014-11-06 (B)</td>
<td>2015-1</td>
</tr>
</tbody>
</table>

### Saved Query

**Saved Query**

**Query Builder**

- Load Run Age 65
- Load Run Age 65 FY Vaccine
- Load Run Immunosuppressed Cohort
- Load Run Immunosuppressed Cohort w/ PK

**#IHIFORUM**
Immunizations Query Results

<table>
<thead>
<tr>
<th>ACG Rub</th>
<th>ACG BMI</th>
<th>ACG Date</th>
<th>Birth Month</th>
<th>Age</th>
<th>Gender</th>
<th>BanCat</th>
<th>Last PCV</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>2.22</td>
<td>10/11/2016</td>
<td>3</td>
<td>59</td>
<td>M</td>
<td>RTA</td>
<td></td>
</tr>
<tr>
<td>Very High</td>
<td>11.18</td>
<td>10/11/2016</td>
<td>1</td>
<td>70</td>
<td>M</td>
<td>RTA</td>
<td></td>
</tr>
<tr>
<td>Very High</td>
<td>6.00</td>
<td>10/11/2016</td>
<td>6</td>
<td>59</td>
<td>M</td>
<td>RTA</td>
<td></td>
</tr>
<tr>
<td>Very High</td>
<td>11.18</td>
<td>10/11/2016</td>
<td>12</td>
<td>86</td>
<td>M</td>
<td>RTAF</td>
<td></td>
</tr>
</tbody>
</table>

Export Request

Optional

Email Address: david.carnahan@us.army.mil

Short Description:

Unlimited without PHI/PII

Limited with PHI/PII

NOTE: The email address is for notification purposes only. A notification message will be sent to you when your export job is ready for retrieval. The email address provided will only be available during the current session. You can check the status of your export job by going to the menu item "User Export List".
Exports & Reports

Appointments
Facility: 0109 - AMC BAMC-FSH

National Capital Area Pilot

Selected High Risk Care Candidates using MHSPHP
National Capital Area Pilot

- Assigned Case Manager and Social Worker to lead Integrated Health Team
  - Trained Formally on Guided Care (Johns Hopkins)
  - Coordinated care with PCM, PCMH team
  - Focused on Transitions of Care using MHSPHP
- 14 patients selected, and 13 controls for 6 months

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Intervention</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalizations</td>
<td>94% Decrease (16 -&gt; 1)</td>
<td>No Change (8 -&gt; 8)</td>
</tr>
<tr>
<td>ER Visits</td>
<td>47% Decrease (17 -&gt; 9)</td>
<td>22% Decrease (9 -&gt; 7)</td>
</tr>
<tr>
<td>Per Member Per Month</td>
<td>57% Decrease (100k -&gt; 43k)</td>
<td>200% Increase (43k -&gt; 123k)</td>
</tr>
</tbody>
</table>

Acknowledgments: Dr. Jeff LaRochelle, lead investigator, for initial results and details of pilot.

Conclusion

- Analytics platform
  - Predictive Analytics
  - Data Discovery at Population Level
- Point of Care Tool
  - PCMH Huddles
  - Case / Utilization Management
  - Disease/Pharmacy Management
- Reporting platform
  - New Tableau Reports
  - Individual Summary Reports
- Enterprise Capability
  - Scalable
  - Flexible
  - Responsive

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