Improved Patient Care for the Most Vulnerable Populations

Presenters:  Sangeeta Joshi - Manager, Decision Support (Business Intelligence)
            Michelle Martin - Decision Support Analyst
Program Background

Sutter Health

- Integrated health system based in Northern California
- 24 hospitals, 5,500 physicians, 53,000 employees

Advanced Illness Management (AIM) Program

- Palliative care program that bridges gaps between hospital, physician’s office and patient’s home
- Piloted in two locations, currently serving 14 locations
- Success of the pilot resulted in a $13M grant from the Centers for Medicare and Medicaid Services’ Innovation Center
- AIM now cares for an average of 2,600+ patients with multiple chronic illnesses in our service area every day
AIM Patient Profile

- “High burden” of disease
- Rapid/significant functional or nutritional decline
- Life Expectancy of 12-18 months or less
- Hospice appropriate
- Represents 5% of the population spending the highest amount of Medicare dollars
- Consuming more hospital and provider resources
AIM Highlights

AIM Improves Quality of Life*

- ED visits* ↓ 15%
- Hospitalizations* ↓ 60%
- ICU Utilization** ↓ 65%

* Data through 8/30/17
** Data through 6/30/17 (ICU metrics)

Patient Experience

- 86% Overall satisfaction
- 98% Complete ACP documents within 30 days
Reporting Challenges

Data silos
No comprehensive reporting across electronic health records (EHRs)

Manual data crunching
- Matching patients
- Data clean-up

Heavy reliance on manual effort even for routine reports

Limited resource availability for analytics or ad-hoc requests

Lack of smart data for timely decision making
Reporting Goals: Develop a solution based on IHI Triple AIM framework

- Centralized reporting
- Data use that can drive operational efficiency and improved patient care
- Framework that ensures scalability, reusability, and reliability
- Self-service BI within supported tools with minimal IT effort
- Effortless analytics for end users
  - Governed data discovery without expert assistance
  - Agility and ease of use

* Data from all sources transformed according to pre-defined rules and ready for consumption every morning
Why MicroStrategy?

Self-Service Business Intelligence (BI) - Approach that empowers users to perform data analytics on their own

- Industry wide survey suggested that most companies implemented self-service BI for the following reasons:
  
  - Constantly changing business needs: 65%
  - Inability of IT to meet business user demand: 57%
  - Need to be a more analytic-driven organization: 54%
  - Slow or untimely access to information: 47%
  - Business user dissatisfaction with IT BI capabilities: 34%
  - Existing environment is too complex to use: 28%
  - Lack of IT budget or need to reduce IT budget: 28%
  - Lack of IT BI/DW skills: 21%
  - Other: 5%
Development Cycle

1. Analyze Source system and data entry processes
2. Discuss and finalize reporting needs
3. Identify gaps and data quality issues
4. Design Architecture and data model
5. Validate data transformation
6. Content Creation, Deployment and Training

Use Corporate IT resources for:
- Data Gathering
- Data Preparation
- Infrastructure Administration
- Governance
Our Strategy

Build from the ground up

- Patient level details from multiple EHRs
- Foundation: Scalable and Comprehensive Architecture
- Centralized operational dashboard: up-to-date trends with drill down to patient level information
- Dashboards for executives

Types of Reports

- Daily Team Huddle
- Operational Dashboard
- Summary Reports
- Data Quality Checks / Reports
- Data Collection eTools
- Ad-Hoc Reports
- External Customers
### Sample Detail Report

#### Enrollment Details

<table>
<thead>
<tr>
<th>Patient</th>
<th>Status</th>
<th>Episode Start Date</th>
<th>Episode End Date</th>
<th>Dx At Enrollment</th>
<th>PCP at Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td>New AIM Enroll - Hospital</td>
<td>04/16/2017</td>
<td>05/13/2017</td>
<td>30</td>
<td>Cardiac disease or CHF,COPD/Ailing disease</td>
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</tr>
<tr>
<td>New AIM Enroll - Hospital</td>
<td>08/29/2017</td>
<td>109</td>
<td>Cardiac disease or CHF,COPD/Ailing disease,Other disease</td>
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<td></td>
</tr>
<tr>
<td>AIM Home Health</td>
<td>03/29/2017</td>
<td>04/19/2017</td>
<td>55</td>
<td>Neurologic/neuromuscular disease</td>
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<tr>
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<td>06/07/2017</td>
<td>07/15/2017</td>
<td>215</td>
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<tr>
<td>AIM Home Health</td>
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<td>08/11/2017</td>
<td>177</td>
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<tr>
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<td>09/04/2017</td>
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<td></td>
</tr>
<tr>
<td>AIM Home Health</td>
<td>09/23/2017</td>
<td>129</td>
<td>Cardiac disease or CHF,Elder stage renal disease with comorbidity</td>
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</tr>
<tr>
<td>AIM Home Health</td>
<td>12/05/2017</td>
<td>12/15/2017</td>
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<td>03/12/2017</td>
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<td>Cardiac disease or CHF,COPD/Ailing disease,Elder stage renal disease with comorbidity</td>
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<td>04/20/2017</td>
<td>05/20/2017</td>
<td>255</td>
<td>Other disease</td>
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<tr>
<td>AIM Home Health</td>
<td>08/13/2017</td>
<td>150</td>
<td>Metastasis/recurrent cancer</td>
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<td></td>
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<tr>
<td>AIM Home Health</td>
<td>10/22/2017</td>
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<td>79</td>
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<tr>
<td>AIM Home Health</td>
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<td>AIM Home Health</td>
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<td>12/15/2017</td>
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<td>Cardiac disease or CHF,Elder stage renal disease with comorbidity,Other disease</td>
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<td>COPD/Ailing disease,Elder stage renal disease with comorbidity,Other disease</td>
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<td>AIM Home Health</td>
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<td>04/21/2017</td>
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<td>Other disease</td>
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</tr>
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<td>06/04/2017</td>
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<td>Other disease</td>
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<td>12/31/2017</td>
<td>01/31/2018</td>
<td>10</td>
<td>COPD/Ailing disease</td>
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#### Summary

<table>
<thead>
<tr>
<th>Description</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No longer eligible</td>
<td>75</td>
</tr>
<tr>
<td>Other</td>
<td>9</td>
</tr>
<tr>
<td>Out of network patient</td>
<td>7</td>
</tr>
<tr>
<td>Outside HHA</td>
<td>14</td>
</tr>
<tr>
<td>Outside Hospice</td>
<td>38</td>
</tr>
<tr>
<td>Patient moved out of area</td>
<td>14</td>
</tr>
<tr>
<td>Patient/family request</td>
<td>67</td>
</tr>
<tr>
<td>SNF:Long term care facility</td>
<td>25</td>
</tr>
<tr>
<td>Unable to contact</td>
<td>21</td>
</tr>
<tr>
<td>Total</td>
<td>578</td>
</tr>
</tbody>
</table>
## Operational Dashboard - Census

### Current Census

<table>
<thead>
<tr>
<th>Status</th>
<th># - Today</th>
<th>% # - Last Week</th>
<th>% # - Last Month</th>
<th>% # - Last Year</th>
<th>% # - Last Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total AVM Health</td>
<td>121</td>
<td>32.5%</td>
<td>32.2%</td>
<td>33.6%</td>
<td>32.2%</td>
</tr>
<tr>
<td>AVM TeleSupport</td>
<td>206</td>
<td>50.4%</td>
<td>50.4%</td>
<td>54.1%</td>
<td>50.4%</td>
</tr>
<tr>
<td>AVM Transitions</td>
<td>25</td>
<td>6.7%</td>
<td>5.1%</td>
<td>4.0%</td>
<td>6.1%</td>
</tr>
<tr>
<td>Pending Handoff from AVM Home Health</td>
<td>2</td>
<td>0.5%</td>
<td>3</td>
<td>0.8%</td>
<td>5</td>
</tr>
<tr>
<td>New AVM Enrollee - Hosp</td>
<td>171</td>
<td>45.1%</td>
<td>45.1%</td>
<td>50.2%</td>
<td>45.1%</td>
</tr>
<tr>
<td>Established AVM Patient - CS</td>
<td>171</td>
<td>45.1%</td>
<td>45.1%</td>
<td>50.2%</td>
<td>45.1%</td>
</tr>
<tr>
<td>Total</td>
<td>551</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### LOS (for status selected on right)

<table>
<thead>
<tr>
<th>LOS Category</th>
<th># Patients on Census</th>
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</thead>
<tbody>
<tr>
<td>&lt; 1 Month</td>
<td>32</td>
</tr>
<tr>
<td>1 to 2 Months</td>
<td>17</td>
</tr>
<tr>
<td>2 to 3 Months</td>
<td>11</td>
</tr>
<tr>
<td>3 to 4 Months</td>
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</tr>
<tr>
<td>4 to 5 Months</td>
<td>1</td>
</tr>
</tbody>
</table>

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### Patient Report Card

- Demographics
- Diagnoses
- Eligibility Criteria
- Insurance Coverage
- Enrollment Details
- Home Visits & Care Coordination
- Hospital Utilization
- Home Health & Hospice Episodes
- Clinical Documentation
### Operational Dashboard - Model Fidelity

**Summary**

- **Ind 1**: Late (48 hrs) or missing 1st Phone contact in Telesupport status - 47 patients
- **Ind 2**: No Phone Contact in last 30 Days in Telesupport status - 48 patients
- **Ind 3**: No In-Person visit within 48 hrs from Start of Care in Home Health Transitions status - 15 patients
- **Ind 4**: No Encounter (Visit/Phone) in 7 Days prior to Last IPED Admission - 10 patients
- **Ind 5**: No In-Person visit within 48 hrs after ED visit or Hospital Discharge - 16 patients
- **Ind 6**: No Triage Call within 48 hrs prior to ED visit or Hospital Admission - 48 patients
- **Ind 7**: Late (≥ 2 days) or missing FHIQ - 30 patients
- **Ind 10**: Missing Consents - 18 patients
- **Ind 11**: Late (≥ 2 days) or missing Emergency Triage Documentation - 100 patients
- **Ind 12**: No Emergency Triage Documentation in the last 60 days since the most recent EMT record - 108 patients
- **Ind 13**: Late or Missing Program Eligibility review in the last 60 days - 225 patients

**Indicator Description**

<table>
<thead>
<tr>
<th># Description</th>
<th>Date From</th>
<th>Date To</th>
<th># Days Difference</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Active patients who were moved into the Telesupport status in the last 30 days and did not receive a phone call within 48 hrs from moving into this status</td>
<td>Date patient started the Telesupport status</td>
<td>(a) If a phone contact was made since the status change, this is the date of that telephone call. (b) If no phone contact was made since the patient entered the Telesupport status, this is blank.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Quarterly Dashboard

**Program Stats**
- Program Launches
- Enrollments
- Insurance
- Census
- Referral Source
- Discharges
- Eligibility
- Visit & Call Intensity
- Referral Status
- LOS
- Diagnoses

**Clinical Documentation**
- ACP
- PHQ

**Sutter Health Hospital and Outpatient Utilization**
- IP Admission Rate
- Hospital Days Last 6 Mos
- 30/90/180 Pre-Post IP
- 30/90/180 Pre-Post MD Visits
- ED Visit Rate
- ED Use Last 36D of Life
- 30/90/180 Pre-Post ED
- 10/90/180 Pre-Post MD Calls
- ICU Use Last 36D of Life
- 30/90/180 Pre-Post ICU
- 30/90/180 Cost Impact
- 30/90/180 Pre-Post ALOS

**LOS on SCAH Hospice**
- By Program Service Area
- By SCAH Hospice Branch
Quarterly Dashboard - Detail Report Grid View

### ED Utilization in Last 30 Days of Life

<table>
<thead>
<tr>
<th>CALENDAR YEAR</th>
<th>2017</th>
<th>2016</th>
<th>2015</th>
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<tbody>
<tr>
<td>Sacramento</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># Program Decedents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># Decedents with more than 1 ED Last 30D of Life</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ED Use Proportion</td>
<td></td>
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<tr>
<td>Roseville</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td># Program Decedents</td>
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<td></td>
</tr>
<tr>
<td># Decedents with more than 1 ED Last 30D of Life</td>
<td></td>
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<td>ED Use Proportion</td>
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</tr>
<tr>
<td>Auburn</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td># Program Decedents</td>
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<td></td>
<td></td>
</tr>
<tr>
<td># Decedents with more than 1 ED Last 30D of Life</td>
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<td></td>
</tr>
<tr>
<td>ED Use Proportion</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### ED Use in Last 30 Days of Life

- **Data Sources:** Patient Registry database (for deceased patients, with death data imported from EPIC and HCHB).
- **Restrictions:** Only Sutter Health facility utilization available for inclusion.
- **Notes on Reporting Methodology:** ED Visits resulting in an Inpatient Hospitalization at the same Sutter facility are not counted (they are included only in the IP metrics).
- **Target (eff. 7/1/2012):** 4.4% or less
- **Denominator:** Count of unique program patients who died in reporting period
- **Numerator:** Count of decedents with more than one ED visit in the last 30 days of life
- **Proportion:** Numerator / Denominator
Quarterly Dashboard - Detail Report Graph View

ED Utilization in Last 30 Days of Life

Service Area

% of Decedents with More than 1 ED Visit in Last 30 Days of Life

# Decedents Breakdown

Graph View
Patient Satisfaction Survey eTool
What Worked for Us

Team Composition

- Data enthusiast
- Strong backing from executive leadership
- Decision support manager on AIM leadership team ensures in-depth understanding of business needs
- Integration of decision support team into business team ensuring commitment to program’s vision and values
- Emphasis on attention to detail, good customer service, clear logical thinking skills

User-Friendly Design

- Simple, intuitive, well structured and consistent look and feel
- Information button within reports providing report details

User Education

- Monthly trainings are offered for new users
- Email notifications and additional trainings for new reports or enhancements
- Step-by-Step training guide is available on Intranet
What’s Next for Us

- Expand solution for other service lines
- Integrate financial information to track financial impact
- Develop algorithm to proactively identify patients with specific care needs
- Begin palliative care metric standardization effort across similar programs at Sutter Health
Thank You

- Questions / Comments / Feedback