We extend the healing ministry of Christ by caring for those who are ill and by nurturing the health of the people in our communities.

EPIC Workload Acuity

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November 2, 2018
Objectives

1). Describe the development and validation of the EPIC predictive staffing tool
2). Describe the potential impact of the EPIC predictive staffing tool within the Centura system

- History and Project Plan
- Overview of EPIC Workload Acuity Tool
- Build Background
- Pilot Project Results
- Next Steps
History and Project Plan
1:5 Nurse to Patient Ratio

WORKLOAD

1:5 Nurse to Patient Ratio
**Illumin8 Staffing Project**

<table>
<thead>
<tr>
<th>Risk-based Staffing</th>
<th>Sick-based (Acuity) Staffing</th>
<th>Workload Staffing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Advantages</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Adjust staffing based on patients risk for adverse events</td>
<td>• Adjust staffing based on patients who are sicker</td>
<td>• Identifies patients and adjust staffing based on nursing workload</td>
</tr>
<tr>
<td>• Increase cost and variation between departments and entities</td>
<td>• Has demonstrated improvement with patient care outcomes</td>
<td>• Has demonstrated improvement with patient care outcomes, improved nursing satisfaction and reduced variation</td>
</tr>
<tr>
<td>• No validated tool or ability to standardize</td>
<td>• Sicker patients do not always need more nursing care</td>
<td>• EPIC functionality with no increased cost</td>
</tr>
<tr>
<td>• No clear correlations with improved patient care outcomes</td>
<td>• Not able to use EPIC for spread</td>
<td>• EPIC tool has not been validated and is in β testing</td>
</tr>
<tr>
<td>• Volume Staffing</td>
<td>• Increases variation between entities</td>
<td>• Would require Centura customization and training</td>
</tr>
<tr>
<td></td>
<td>• Volume Staffing</td>
<td></td>
</tr>
</tbody>
</table>
Overview EPIC Workload Acuity Tool
Engaged frontline staff using rapid cycle change to customized the foundational “out of the box” EPIC workload tool for that of the Centura EPIC build
• How much **work** is a given patient for a nurse?
Available in Workbench reports to manage real-time and long-term.

Algorithm

Documentation

Score Available for Review

Score Filed

Available in Workbench reports to manage real-time and long-term.
<table>
<thead>
<tr>
<th>Patient</th>
<th>Status</th>
<th>Notifications</th>
<th>Admit Req'd Doc</th>
<th>Workload Score</th>
<th>Risk of Unplanned Readmission</th>
<th>MRSA Swab Needed</th>
<th>Preassigned Nurses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adama, Aaron</td>
<td>303 (OR) Community acquired pneumonia</td>
<td></td>
<td></td>
<td>8</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atwood, Glen</td>
<td>305 Community acquired MRSA</td>
<td></td>
<td></td>
<td>112</td>
<td>9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avery, Glen</td>
<td>302 (PACU) Pneumonia with sepsis</td>
<td></td>
<td></td>
<td>97</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goodman, Saul</td>
<td>308 Essential Hypertension</td>
<td></td>
<td></td>
<td>4</td>
<td>3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hodge, Brad</td>
<td>310 Angina pectoris</td>
<td></td>
<td></td>
<td>70</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solace, Gabrielle</td>
<td>307 Angina pectoris syncope</td>
<td></td>
<td></td>
<td>68</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vama, Sachin R</td>
<td>306 Malignant hypertension</td>
<td></td>
<td></td>
<td>54</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Williams, Sama</td>
<td>308 ITP</td>
<td></td>
<td></td>
<td>52</td>
<td>5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient</td>
<td>Status</td>
<td>Notifications</td>
<td>Admit Req’d Doc</td>
<td>Workload Score</td>
<td>Risk of Unplanned Readmission</td>
<td>MRSA Swab Needed</td>
<td>Preassigned Nurses</td>
</tr>
<tr>
<td>---------</td>
<td>--------</td>
<td>---------------</td>
<td>----------------</td>
<td>----------------</td>
<td>-------------------------------</td>
<td>-----------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Adama, Aaron</td>
<td>56 years / M</td>
<td>Community acquired pneumonia</td>
<td>—</td>
<td>8</td>
<td>5%</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Atwood, Glen</td>
<td>56 years / M</td>
<td>Community acquired pneumonia</td>
<td>—</td>
<td>104</td>
<td>9%</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Avery, Glen</td>
<td>67 years / M</td>
<td>Pneumonia with acute respiratory failure</td>
<td>—</td>
<td>57</td>
<td>10%</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Goodman, Saul</td>
<td>68 years / M</td>
<td>Essential Hypertension</td>
<td>—</td>
<td>4</td>
<td>3%</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

**Atwood, Glen #30138 (Acct:206902) (56 y.o. M) (Adm: 09/28/16)**

**Workload Acuity - Total Score**: 104

**ADLS**
- Total Score: 0

**Risks**
- Total Score: 0

**Admissions and Transfers**
- Total Score: 0

**Orders**
- Total Score: 0

**Medications**
- Total Score: 68
  - IV Titrations - New bags
  - IV Titrations - Rate Change, Hold, and Restarted
  - Continuous Maintenance Infusions - New Bags
  - IV Fluid Boluses
  - IV Push

**Assessments**
- Total Score: 30
  - 2.8 WDL
  - 19.9 Vital Signs Documented
  - 16 Pain

**Discharges**
- Total Score: 0

**LDA Care**
- Total Score: 2
  - 2 Has Dwelling Foley Cath?
One algorithm

Does not contribute if not ordered

Medications
Assessments
Orders
Restraints

Total Score

Workload Score
- 78
- 66
- 44
- 94
- 81
- 99
- 51
- 56
- 33
1:6 Nurse to Patient Ratio

1:4 Nurse to Patient Ratio

WORKLOAD
Build Background

$1: CER 3040035562 - IP WORKLOAD ACUITY: GENERAL-HAS A SITTER?

$2: CER 3040035541 - IP WORKLOAD ACUITY: ASSESSMENTS-URINE INCONTINENCE

$3: CER 3040035597 - IP WORKLOAD ACUITY: LDA CARE-DOES PATIENT HAVE DWELLING FOLEY CATH?

$4: Number of times urine status is documented in past 24 hours.

$5: CER 3040035654 - IP WORKLOAD ACUITY: ASSESSMENTS-RETURN URINE MEASURE OR ELSE RETURN URINE CURRENCIES

$2*(s3*s4+(1-s3)*s5+(1-s2)*s4)
First Pass Complete
IP WORKLOAD ACUITY: ADLS-DRESSING

Dressing

s1: Result of CER 35562 - IP WORKLOAD ACUITY: GENERAL-HAS A SITTER?
s2: FLO 7081470 - R IP ADL GROOMING = Independent return 0
s3: FLO 7081470 - R IP ADL GROOMING = Needs Assistance return 2
s4: FLO 7081470 - R IP ADL GROOMING = Dependent returns 4
s5: FLO 7081470 - R IP ADL GROOMING = Unable to assess return 0
s1*(s2+s3+s4+s5)

First Pass Complete
IP WORKLOAD ACUITY: ADLS-GROOMING

Grooming

s1: Result of CER 35562 - IP WORKLOAD ACUITY: GENERAL-HAS A SITTER?
s2: FLO 7081480 - R IP ADL FEEDING = Independent return 0
s3: FLO 7081480 - R IP ADL FEEDING = Needs Assistance return 2
s4: FLO 7081480 - R IP ADL FEEDING = Dependent returns 4
s5: FLO 7081480 - R IP ADL FEEDING = Unable to assess return 0
s1*(s2+s3+s4+s5)

First Pass Complete
IP WORKLOAD ACUITY: ADLS-FEEDING

Feeding

s1: Result of CER 35562 - IP WORKLOAD ACUITY: GENERAL-HAS A SITTER?
s2: FLO 7081490 - R IP ADL BATHING = Independent return 0
s3: FLO 7081490 - R IP ADL BATHING = Needs Assistance return 2
s4: FLO 7081490 - R IP ADL BATHING = Dependent returns 4
s5: FLO 7081490 - R IP ADL BATHING = Unable to assess return 0
s1*(s2+s3+s4+s5)
## Workload by Unit

**Grouped by:** Unit, Nurses, Patient Name/Age/Sex

<table>
<thead>
<tr>
<th>Unit</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>MedSg1</td>
<td>245</td>
</tr>
<tr>
<td>Jerry Ansonne, RN (8 subgroups)</td>
<td>40</td>
</tr>
<tr>
<td>Kelly E Brunson, RN (6 subgroups)</td>
<td>24</td>
</tr>
<tr>
<td>Kim Harker, RN (7 subgroups)</td>
<td>48</td>
</tr>
<tr>
<td>Sam Adams (4 subgroups)</td>
<td>24</td>
</tr>
<tr>
<td>Sam Carter (6 subgroups)</td>
<td>12</td>
</tr>
<tr>
<td>Sydney Adams, RN</td>
<td>64</td>
</tr>
<tr>
<td>Beams, A (24 y.o. M)</td>
<td>6</td>
</tr>
<tr>
<td>Daeger, J (78 y.o. M)</td>
<td>6</td>
</tr>
<tr>
<td>Jenson, K (25 y.o. M)</td>
<td>6</td>
</tr>
<tr>
<td>Martin, I (37 y.o. F)</td>
<td>6</td>
</tr>
<tr>
<td>McCauley, N (73 y.o. M)</td>
<td>6</td>
</tr>
<tr>
<td>Mills, I (68 y.o. M)</td>
<td>7</td>
</tr>
<tr>
<td>Perelli, E (42 y.o. F)</td>
<td>15</td>
</tr>
<tr>
<td>Skidmore, B (71 y.o. F)</td>
<td>12</td>
</tr>
<tr>
<td>Tori Savage, RN (8 subgroups)</td>
<td>34</td>
</tr>
<tr>
<td>MedSg2 (15 subgroups)</td>
<td>245</td>
</tr>
<tr>
<td>MedSg3 (3 subgroups)</td>
<td>130</td>
</tr>
</tbody>
</table>
Step #2

Built and mapped 280 different rules and used linear regression and statistical modeling to validate the effectiveness of the EPIC Workload tool in balancing workload
Pilot Results
Workload Staffing Score vs. Perceived Workload
SANHC

\[ y = 6.6688x - 2.3499 \]

\[ R^2 = 0.4977 \]

Correlation \( r \) = 0.705
<table>
<thead>
<tr>
<th>Metric</th>
<th>Metric Type</th>
<th>Initial FY16 Thru-Jan</th>
<th>Target</th>
<th>30 days</th>
<th>60 days</th>
<th>90 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Patient Satisfaction</td>
<td>Weekly Topbox score (Press Ganey)</td>
<td>77.9</td>
<td>&gt;85.0</td>
<td>92.1</td>
<td>85.5</td>
<td>83.1</td>
</tr>
<tr>
<td>• Associate Satisfaction</td>
<td>Ad hoc Employee Baseline survey</td>
<td>3.19</td>
<td>4.00</td>
<td>N/A</td>
<td>N/A</td>
<td>3.84</td>
</tr>
<tr>
<td>• Adverse Events</td>
<td>PSI90 Safety score</td>
<td>2.5</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>• Productivity</td>
<td>Weekly Vision report</td>
<td>96.06%</td>
<td>&gt;100%</td>
<td>103.3%</td>
<td>102.8%</td>
<td>103.8%</td>
</tr>
<tr>
<td>• Correlation Value</td>
<td>Weekly Linear regression equation report</td>
<td>N/A</td>
<td>&gt;0.7</td>
<td>0.14</td>
<td>0.705</td>
<td>0.712</td>
</tr>
<tr>
<td>• Mapped Rules</td>
<td># of system changes per week</td>
<td>N/A</td>
<td>50</td>
<td>23</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Decreased EPIC Build Time</td>
<td>EPIC implementation estimate</td>
<td>N/A</td>
<td>&lt;6 months</td>
<td>180</td>
<td>220</td>
<td>280</td>
</tr>
</tbody>
</table>
LAH Workload Staffing Score vs. Perceived Workload Score (n=323)

\[ y = 7.7424x - 7.0582 \]

\[ R^2 = 0.7203 \]
Step #3: Build Future Reports

Completed
- Starter Algorithm
- Tools to Calculate and Show Workload Acuity
  - Patient Lists, Reporting Workbench
- Data Model for Reporting

Built and Ready
- Reporting Tools
  - Improved tools for creating reports
  - Out of the box reports
- Build Improvements
- Weighted Rules

Next Steps
- EPIC Mix Analysis
- Integration with staffing systems
- Predictive Long-term reports
### Assigning Patients in EMC MEDSURG - 23 Patients

<table>
<thead>
<tr>
<th>Status</th>
<th>Workload</th>
<th>MEWS</th>
<th>Needs</th>
<th>Continuity of Care</th>
<th>Preassigned Nurses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Henderson, Elizabeth</td>
<td>105</td>
<td>3</td>
<td>—</td>
<td>Alissa Greene, RN</td>
<td>—</td>
</tr>
<tr>
<td>Houston, Rosa</td>
<td>113</td>
<td>9</td>
<td>Spanish</td>
<td>—</td>
<td>Jennifer Price, RN</td>
</tr>
<tr>
<td>Avery, Glen</td>
<td>115</td>
<td>7</td>
<td>—</td>
<td>Alissa Greene, RN</td>
<td>Jennifer Price, RN</td>
</tr>
<tr>
<td>Adama, Aaron</td>
<td>119</td>
<td>3</td>
<td>Contact Isolation</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Atwood, Glen</td>
<td>99</td>
<td>6</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Solace, Gabrielle</td>
<td>69</td>
<td>5</td>
<td>Spanish</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Vaux, Dorothy P.</td>
<td>60</td>
<td>9</td>
<td>Airborne Isolation</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>Blair, Irvin</td>
<td>154</td>
<td>3</td>
<td>ECMO</td>
<td>Alissa Greene, RN</td>
<td>—</td>
</tr>
</tbody>
</table>

**Workload Acuity**

- Medications
- Assessments
- Risks
- Admission/Transfer
- Discharge
- Orders
- LDA Care
- Wounds
- ADLs

**Contributing Factors**

- Incomplete Required Admission Documentation
- Low number of Medications
- Fall Risk
- No Pressure Ulcers
- NIV
- 02 del in both ears
- EMT
- Foley Catheter
- Interpreter Needed

**Current Status**

- 23 of 25 staffed beds
- 5 of 7 discharges by 1400
- Auto-refreshed just now

**Search**

- Search all admitted
- Search other admissions

**Previous Shift Nurses**

- Jessica Dawes, RN
- Reynolds Turner, RN
- Lisette Bern, RN

**On Shift Nurses**

- Alissa Greene, RN
- Jennifer Price, RN
- Becky Lynn, RN
- Luis Gutierrez, RN
- Tonya Sandusky, RN

**Languages**

- Spanish
- Contact Isolation
- ECMO
- Airborne
Workload Acuity and Quality Outcomes Unit Level

DEPARTMENT ID: MICU, EMC (aka Medical ICU)

Cost over Workload Acuity Score

- Workload Acuity Score
- Central Line-Associated BSI
- Patient Falls
- Catheter-Associated UTI
- Overall Readmission Rate
- RN Turnover

Quality
- Workload Acuity Score: Q1 '14 260, Q2 '14 250, Q3 '14 280, Q4 '14 260
- Central Line-Associated BSI: Q1 '14 1.3, Q2 '14 0.0, Q3 '14 0.0, Q4 '14 0.0
- Patient Falls: Q1 '14 0.0, Q2 '14 0.6, Q3 '14 0.0, Q4 '14 0.0
- Catheter-Associated UTI: Q1 '14 0.0, Q2 '14 4.0, Q3 '14 0.0, Q4 '14 0.0
- Overall Readmission Rate: Q1 '14 6.0%, Q2 '14 10.0%, Q3 '14 15.0%, Q4 '14 10.0%
- RN Turnover: Q1 '14 0.0%, Q2 '14 0.0%, Q3 '14 1.0%, Q4 '14 0.0%

Satisfaction
- RN Job Enjoyment: Q1 '14 80%, Q2 '14 85%, Q3 '14 90%, Q4 '14 88%
- RN Intent to stay: Q1 '14 80%, Q2 '14 86%, Q3 '14 92%, Q4 '14 94%
- Patients would recommend Hospital: Q1 '14 80%, Q2 '14 80%, Q3 '14 86%, Q4 '14 90%

- CLABSI $: Q1 '14 36,000, Q2 '14 0, Q3 '14 0, Q4 '14 0
- Falls $: Q1 '14 0, Q2 '14 13,000, Q3 '14 13,000, Q4 '14 0
- CAUTI $: Q1 '14 0, Q2 '14 800, Q3 '14 0, Q4 '14 0
- Readmission $: Q1 '14 13,000, Q2 '14 26,000, Q3 '14 39,000, Q4 '14 26,000
- Turnover $: Q1 '14 0, Q2 '14 0, Q3 '14 60,000, Q4 '14 0
- Total Cost: Q1 '14 $49,000, Q2 '14 $39,800, Q3 '14 $112,000, Q4 '14 $26,000

Percentage
- Q1 '14: 80%
- Q2 '14: 85%
- Q3 '14: 90%
- Q4 '14: 95%
We extend the healing ministry of Christ by caring for those who are ill and by nurturing the health of the people in our communities.

Special Thanks to....

Belinda Shaw
Rhonda Ward
Lea Bell

Petra Olson
Graham Degunst
Illumin8 nebula team