Learning Objectives

- Describe Oregon requirements for acuity-informed resource allocation
- Communicate lessons learned from a pilot implementation of a work intensity tool
- Articulate steps to select, implement, and evaluate a work intensity tool at your hospital
Oregon Requirements

- Registered Nurses on hospital-based patient care units manage ever-changing patient conditions
- The Oregon State Staffing law states that patient acuity must be a factor in formulating a staffing plan
Work Intensity Tool

- Epic module that generates work intensity scores
  - Patient level
  - Nurse level
  - Unit level
- Scores are derived from documentation, interdisciplinary orders, looks back and forward in time
- As new data is entered, workload scoring algorithms automatically update intensity scores
Work Intensity Score

Patient 1: 200 points
- Medications, Orders
- Assessments
- Risks
- ADT, LDA, ADLs

Patient 2: 250 points
- Medications, Orders
- Assessments
- Risks
- ADT, LDA, ADLs

RN Score: 450 points
Sum of patient scores within RN assignment
Unit-level Trending

Unit-level Score
Sum of all Pt. scores

Oregon Nurse Staffing Collaborative
Oregon Nurses Association and Oregon Association of Hospitals and Health Systems
Overview of OHSU’s Journey

Configuration
- Build standard logic into HER
- Test basic functionality

Pilot Testing
- Pilot testing – inpatient units
- RN Rounding every shift

Evaluation
- Relationship of score to RN perception
- Use in staffing plans/daily workflow

2 months
Part-time effort

12 weeks
Part-time effort

Ongoing
Part-time effort

Personnel:
Nurse Informaticist
Epic Analyst
Epic Report Writer

Nursing, Informatics, QI, Research
Charge RNs, modified-duty RNs

Oregon Nurse Staffing Collaborative
Pilot Implementation

- Make work intensity transparent
- Provide a foundation for consistent use of a reliable tool across the organization
- Assess concordance between work intensity scores and RN perceptions of appropriateness

Pilot units:
- Adult ICU
- Pediatric ICU
- Pediatric acute care
- Adult acute care
- Obstetrics and Labor & Delivery
During the first 4 hours of my work shift, my patient care assignment was appropriate, considering both the number of patients and the care they required.

*Question adapted from NDNQI RN Survey*
Pilot Scope, Data Collection
Aug – Oct, 2018

Scope: Six pilot units

Data: 2,485 complete observations
- RN-level work intensity score
- RN appropriateness rating

Data handling notes:
- Observations lacking a complete score or RN rating were excluded
- Missing infant data was imputed for the Mother Baby Unit based on mean infant score
Majority of RNs agreed that their patient assignment was appropriate

RN Appropriateness Ratings  n = 2,485

- Strongly Agree 76%
- Agree 14%
- Tend to Agree 5%
- Tend to Disagree 3%
- Disagree 2%
- Strongly Disagree 1%
Units have different “typical” RN work intensity score ranges

Range, RN work intensity scores by Unit

Box: 50% of observed values (central tendency)
Whiskers: Minimum & maximum observed values

<table>
<thead>
<tr>
<th>Unit</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>MICU</td>
<td>n = 684</td>
</tr>
<tr>
<td>PICU</td>
<td>n = 733</td>
</tr>
<tr>
<td>Adult Acute</td>
<td>n = 182</td>
</tr>
<tr>
<td>Peds Acute</td>
<td>n = 186</td>
</tr>
<tr>
<td>L&amp;D</td>
<td>n = 238</td>
</tr>
<tr>
<td>Mother Baby</td>
<td>n = 462</td>
</tr>
</tbody>
</table>

Total observations = 2,485
We expected higher scores to be associated with lower RN ratings

Expected relationship

- High score
- Medium score
- Low score

Strongly Disagree | Disagree | Tend to Disagree | Tend to Agree | Agree | Strongly Agree
We observed a weak negative association between scores & ratings

- As scores increase, RN perception decreases
- Work intensity scores generally mirror work intensity
- Scores can augment human judgement in resource allocation

<table>
<thead>
<tr>
<th>Patient Care Unit</th>
<th>n</th>
<th>Spearman’s Rank Correlation</th>
<th>p-value</th>
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</thead>
<tbody>
<tr>
<td>Pediatric Intensive Care</td>
<td>733</td>
<td>-0.232</td>
<td>&lt;.001</td>
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<tr>
<td>Medical Intensive Care</td>
<td>683</td>
<td>-0.186</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Mother Baby</td>
<td>462</td>
<td>-0.147</td>
<td>.002</td>
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<tr>
<td>Labor &amp; Delivery</td>
<td>238</td>
<td>-0.090</td>
<td>.165</td>
</tr>
<tr>
<td>Pediatric Acute Care</td>
<td>223</td>
<td>-0.154</td>
<td>.021</td>
</tr>
<tr>
<td>Adult Acute Care</td>
<td>182</td>
<td>-0.134</td>
<td>.072</td>
</tr>
</tbody>
</table>
All units exhibited notable score overlap across rating categories.

Range, MICU RN work intensity scores

Total observations = 683
Key Work Intensity Pilot Learnings

- Gained confidence in usefulness of the work intensity tool
- Identified opportunities for improvement
  - Electronic tracking of RNs patient assignments is a prerequisite to RN-level work intensity scores
  - Labor & delivery required some additional logic to reflect their work
- Charge nurses appreciate the opportunity to make intensity-informed patient assignments
Patient-level scores are relatively stable across time

Mean Patient Score, MICU Observations across 3 months: 4,639

- Mean patient work intensity scores tend to fluctuate within a single standard deviation
- Volume and turnover are important factors in addition to patient work intensity
Integration into staffing plans

- Currently a work in progress
- Units are gaining experience using scores
  - Dynamically generated scores appear on patient list
  - Periodic review of within-Epic trending tools
  - Quarterly review of custom reports
    - Control chart – to show variation across time
    - Mean, 25th and 75th percentile values, median and standard deviation of patient-level work intensity scores for each unit
Getting started

1. Engage frontline staff & leaders!
2. Assess availability of acuity/work intensity tools
   - Electronic health record
   - Staffing software
   - Published or custom-developed tools
3. Prepare and test basic functionality
4. Evaluate
   - Usability, usefulness, correlation with RN perception or other known factors
5. Incorporate into staffing plans
Share learning & best practices

The journey to acuity-informed staffing will be an ongoing learning process. Let’s help one another!

- Share your journey via publications & conferences
- Leverage existing regional knowledge-sharing networks
- Consider forming new communities of practice
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