Patient Acuity System Redesign: Registered Nurse Satisfaction, Patient Care Requirement and Comparison of Instruments

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OUTLINE

- Introduction
- Background
- Problem Statement
- Purpose
- Methods and Procedures
- Preliminary Results
- Challenges/Limitations
- Benefits
- Conclusion
- Implications
INTRODUCTION

- Washington Hospital Healthcare System
BACKGROUND

- Patient Classification System (PCS)
  - First known PCS (Lenox Hill Hospital)
BACKGROUND

- Patient Classification System (PCS)
  - Identifies and categorizes patients
  - Assists nurse managers
  - Nursing Services
  - Institute of Medicine (IOM)
  - Federal, State and regulatory agencies
BACKGROUND

- Patient Classification System (PCS)
  - California ratio law
  - Evolution
  - Washington Hospital Healthcare System (WHHS) adopted Patient Classification System
BACKGROUND

- Patient Classification System (PCS)
  - Literature reviews
  - Development of Washington Hospital Acuity Workload System (WAWS).
PROBLEM STATEMENT

- Subjective
- No distinct patient differentiation
- No automation of scoring
- Source of dissatisfaction to nurses
- Costly
PURPOSE

- Investigate the nurse satisfaction on the current Patient Acuity System
- Compare two patient acuity systems
  - Current Patient Acuity System
  - New Washington Hospital Workload System (WAWS)
- Investigate the perception and satisfaction of the staff nurses on the efficiency of the new patient acuity system (WAWS).
Theoretical

- Severity = Physical/psychological patient condition
- Intensity = Workload and care complexity
- Patient Acuity = Severity + Intensity
Literature Review

- Empirical
  - Measurement of nursing resources
  - Reliability & Validity
  - No existing gold standard
  - Multiple complexity factors
  - Unit characteristics
  - Situations & Unit attributes
  - Variability activities
  - Indirect care indicators
METHODS

- **Subjects**
  - Convenient sample: Patients admitted to the ICU within study period for at least 8 hours
  - Registered Nurses

- **Setting**
  - Critical Care Unit (n=748 patients)

- **Questionnaires & Electronic Health Record (EHR)**
  - Nurse Satisfaction
  - Current & New patient acuity system (EHR)

- **Designs**
  - Quantitative (Objective measure)
  - Qualitative (Subjective measure)

- **Time Period**: 30 days

- **Frequency of Evaluation**:
  - Currently acuity is evaluated once every shift vs. WAWS every four hours
METHODS

- Description of the Data Collection Tools
  - Pre and Post Questionnaires
METHODS

- Description of the Data Collection Tools
  - Current Patient Classification System
METHODS

- Description of the Data Collection Tools
  - New WAWs Patient Classification System
METHODS

Why Acuity Workload System in EMR?

• Automatic vs manual calculation
• Standardized formula provides objective, meaningful scores
• No need to send data to a third party application
Known EMR Gaps

• Creating formula required significant analysis and configuration
  ▪ No standard time unit per ‘point’

• Minimal out-of-the-box validation tools
• No analytical report developed.
Acuity Formula Methodology

- Acuity defines RN Workload: not necessarily equivalent to severity of patient’s condition
- Include Core Acuity Indicators in EMR
  - Indicator must be documented consistently
  - Indicator must identify acuity frequently
  - Avoid redundancy in the formula
  - Avoid diagnosis-based points
- Create an acuity formula that is easy to understand and easy to maintain
METHODS

Functionality Gaps

• Transfers and patient transport in-house
• Scores based on procedure orders
• Care plans and patient education
• Retrospective Acuity Calculation
METHODS

• Acuity Formula Customization Pre-launch

  Customizes Formula in the EMR system

  Validate the formula with real patient data in the background

  Adjust formula per the outcome from real patient data
METHODS

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<thead>
<tr>
<th>Nutrition (Adult)</th>
<th>Diet/Feeding Assistance</th>
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<tr>
<td>Diet/Nutrition Prescription</td>
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<tr>
<td>Specialty Diet/Nutrition Prescription</td>
<td>tray set-up</td>
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<td>Diet/Feeding Assistance</td>
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<td>Diet/Feeding Tolerance</td>
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<td>Food Intake (%)</td>
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<td>Supplement Intake (%)</td>
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<td>Fluids Requirement</td>
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<td>Carb intake (gram)</td>
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Select Single Option: (F5)
METHODS

• ADL Row Details
  – Diet/Feeding Assistance
    ▪ 4 points if patient requires “total feed”
    ▪ 3 points if patient requires “assisted with feeding”
    ▪ 2 points if patient requires “tray set-up”
    ▪ 1 point if patient requires “other (see comments)”
    ▪ 0 point if patient requires “none”
  – Diet/Nutrition Prescription
    ▪ 3 points if patient is on “tube feeding”
### METHODS

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METHODS
## METHODS

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METHODS

- Description of the Ethical Considerations
  - Anonymous
  - Consent
  - Confidential
  - Institutional Review Board approved study
  - No Monetary benefits to the investigators
  - No cost/Risk to the participants
METHODS

- Description of the Data Analysis
  - Correlation of the two scales (Spearman’s Correlation)
  - Regression analysis
  - Precision: Validity of the new scale (Factor Analysis)
  - Statistical Software R
PRELIMINARY DATA ANALYSIS

- Nurse satisfaction of the current patient acuity system
  - Accuracy
  - Utility
  - Suitability
  - Nurse satisfaction
- Comparison of the current and new acuity system
Nurse Rating of **Accuracy** of the Current System

“The current patient acuity system accurately reflects the required patient care”
Nurse Rating of **Utility** of the Current System

“The current patient acuity system is useful to staff”

Over half (56%) of critical care nurses disagreed/strongly disagreed on the utility of the existing system
The largest proportion of staff (40%) strongly disagreed that the current system saved them time, with almost two-thirds (63%) who either disagreed/strongly disagreed on its ability to save time during documentation.
Half of the nurses reported disagreeing/strongly disagreeing with being satisfied with the current acuity system (51%)
Nurse satisfaction with the acuity system was significantly associated with their opinion of whether the system was accurate.

Correlation Coefficient ($r$): 0.84

$p < 0.0001$
Key Comments from Nurses

- **Frequency**
  - “Not frequent enough”
  - “Not rapid enough to reflect patient acuity”

- **Accuracy**
  - “Not specific enough”
  - “Doesn’t reflect social, spiritual needs”

- Does not impact resource allocation
Summary of Satisfaction with Current Acuity System

- Nurses are generally not satisfied with the current acuity system, mainly due to the following:
  
  Time required to complete acuity score
  
  Perceived utility

- Nurses’ opinion of accuracy improves satisfaction with tool
Evaluating Acuity Over Time

Workload Acuity Score is able to better capture variability in patient acuity level over their stay in Critical Care
Comparing Workload Acuity to Current System: Low Acuity

The median Workload Acuity Score for low acuity: 42.9
Range: 30.5-56.8
Comparing Workload Acuity to Current System: Average Acuity

The median Workload Acuity Score for average acuity: 48.2
Range: 32.6-140.8
Comparing Workload Acuity to Current System: Above Average Acuity

The median Workload Acuity Score for above average acuity: 78.5
Range: 22.6-249.6
Comparing Workload Acuity to Current System: High Acuity

The median Workload Acuity Score for high acuity: 134.4
Range: 48.1-255.4
Comparing Workload Acuity to Current System: Summary

Preliminary analysis shows that the workload acuity score (WAWS) is able to accurately differentiate between:

- Low and all other levels*

- Average and Above Average Acuity**

- Average and High Acuity*

- WAWS is not able to distinguish between Above Average and High Acuity
- More variability (dynamic, real-time) for higher acuity levels

*p<0.01, **p<0.05
Statistical significance determined by Tukey HSD Test
CHALLENGES/LIMITATIONS

- Published materials
- A new system
- Concordance
- Historic data
BENEFITS

- Generation of new knowledge
- Enhancement/Efficiency of the new acuity system
- Reduce workload
- Increase time spent with the patients
- Increase patient satisfaction
- Increase nurse satisfaction
- Cost Savings
CONCLUSION

- Validation of nurse satisfaction across different service lines
- Increase nurse satisfaction
- Reduce workload
- Efficient Patient Acuity System
- Cost Saving measure
IMPLICATIONS

- Lack of consistent approach to patient acuity
- Congruence measures in nursing intensity
- Refinement of the new instrument
- Exploratory analysis for significant clinical factors
THANK YOU
References


