Clinical Data Analytics Workgroup

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Purpose

• Demonstrate the value of sharable and comparable nurse-sensitive data to support practice and translational research for transforming health care and improving patient quality and safety.
Key Priorities

• Examine data for population health analytics that includes nursing data along with other interprofessional data to inform risk management in population health.
• Validate flowsheet information models across multiple health systems.
• Apply data science methods,
  – using validated information models derived from diverse sources of healthcare data,
  – to address nurse-sensitive research questions that have the potential to inform nursing and multidisciplinary approaches for better patient care and outcomes
Population Health Informatics Subgroup

- **Co-leads:** Martha Sylvia (MUSC) and Sharon Hewner (U at B)
- The purpose of this group is to:
  - Document the extent to which nursing data is used in population health analytics today
  - Determine nursing care related data points that can be used to inform this process. This is informed by the larger analytic workgroup (the variables and models they are validating)
  - Trial new analytic methods (non-hypothesis based) for using this data in combination with traditional data sources
  - Trial population health analytic processes with new nursing care related data points.
  - Evaluate opportunities to also include the patient voice in their own care with standardized coding
Accomplishments 2016-2017

• Publication in Process
  – A Review of Risk Prediction and Segmentation Models Used in the U.S. for Assessing Risk in Whole Populations: Implications for Population Health Nursing
Data Science

• Co-Leads: Steve Johnson & Lisiane Pruinelli (UMN)
• The purpose of this subgroup is to:
  – Define principles of data science for personalized care using nursing-sensitive data
  – Conduct full life-cycle data science projects to serve as exemplars for cross-organization data science
  – Use validated reference information models to frame research questions, to guide data extraction, and support study design towards personalized care
  – Document best practices for data science, develop educational materials for other Nursing Knowledge Big Data workgroups to use, disseminate findings and act as advisors on other projects
Accomplishments 2017-2018

• Developed a Charter and workgroup activities roadmap with member input, commitment and guidance
• Recruited members for the workgroup, setup a project site and mailing lists
• Identified a simple and clinically relevant research question using the Pain information model that is related to the opioid crisis which is also feasible of being analyzed in the context of big data methodologies.
• Developed and conducted 2 “hands-on/interactive” workshops on Data Science. One at the AMIA 2018 Clinical Informatics Conference (~ 70 participants) and one at the 2018 Nursing Knowledge Big Data Conference in June (Pre-Conference Track 1).
• Grant submission (funded):
  – Pruinelli L, Johnson S. School of Nursing Foundation Grant (Title: Improving Population Outcomes Using Data Science: A Roadmap for Nurse Leaders). 02/01/2018-01/31/2019
Publications


Validation of Information Models Subgroup

• **Co-leads:** Kay Lytle (Duke), Bonnie Westra (UMN)

• **Purpose**
  – Validate previously developed information models from flowsheet data to extend national standards with nurse-sensitive data from 10 organizations.
  – Collaborate on developing a process for validation of information models with flowsheet data
# Information Models

<table>
<thead>
<tr>
<th>Information Model Name</th>
<th># Flowsheet IDs Mapped to Observables</th>
<th># Information Model Classes/Observables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pain</td>
<td>309</td>
<td>12</td>
</tr>
<tr>
<td>CAUTI/GU</td>
<td>79</td>
<td>3</td>
</tr>
<tr>
<td>Fall Prevention</td>
<td>59*</td>
<td>4</td>
</tr>
<tr>
<td>Pressure Ulcers</td>
<td>104</td>
<td>6</td>
</tr>
<tr>
<td>VTE</td>
<td>67</td>
<td>8</td>
</tr>
<tr>
<td>Cardiovascular System</td>
<td>241</td>
<td>8</td>
</tr>
<tr>
<td>Gastrointestinal System</td>
<td>60</td>
<td>3</td>
</tr>
<tr>
<td>Musculoskeletal System</td>
<td>276</td>
<td>9</td>
</tr>
<tr>
<td>Respiratory System</td>
<td>272</td>
<td>12</td>
</tr>
<tr>
<td>Vital Signs/Anthropometrics</td>
<td>85</td>
<td>10</td>
</tr>
</tbody>
</table>
Information Model Development Process

1. Identify Clinical Data Model Topic
2. Identify Concepts
3. Map Flowsheets to Concepts
4. Present
5. Validate
6. Compare across systems

One Health System

Mult. Health Systems
Accomplishments 2017-2018

• FloMap software refined - survey of value sets and revised reference information models
• Published article on process and results of Pain IM
• Handed off the Pain IM to the Encoding and Modeling Workgroup for LOINC and SNOMED CT coding
• Revised the process for validation of information models
• Initiated validation of the Genitourinary and Fall Prevention IMs
Publications


Presentations


• Westra, B.L. Pain Information Model – Development and Validation, LOINC Nursing Nursin
