Improving NICU team structure: Use of Social Network Analysis

The Problem

Providing high quality care in the Neonatal Intensive Care Unit (NICU) requires effective collaboration between a large and diverse network of care providers. A growing body of literature examining other types of teams/networks such as those involved in scientific collaborations, protein interactions within the cell, social acquaintances of obese individuals, and even the Broadway musical industry has shown that the structure of these networks and the mechanisms by which they assemble have important implications for network functional and performance characteristics. These approaches from other industries are likely to be valuable in healthcare

Aim/Goal

➢ To develop metrics of NICU team structure using network analysis

➢ To examine the relationship between team structure and care quality

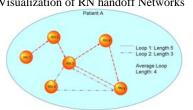➢ To create methods for optimizing team structure

The Team

➢ James Gray MD, MS

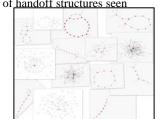➢ Jane Smallcomb RN, MS

➢ Darcy Davis BA,

➢ Nitesh Chawla PhD

The Interventions

➢ Used the EMRS to identify patient-nurse interactions over a 5 year period

➢ Generated and reviewed visual and statistical representations of RN handoff networks for each patient

➢ Examined the change in nursing teams over the hospitalization.

➢ Analyzed the relationship of team structure to family satisfaction
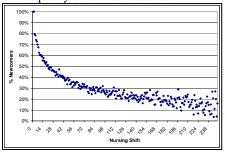
The Results/Progress to Date

Visualization of RN handoff Networks
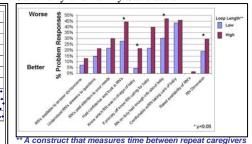

Sample of handoff structures seen

Frequency of newcomers to team

RN Continuity and Family Satisfaction

** A construct that measures time between repeat caregivers

Lessons Learned

➢ Great diversity exists in nursing team structure

➢ Unexpectedly high rates of team newcomers are seen even late in a patients NICU stay.

➢ Enhanced continuity as measured by quantitative metrics is associated with improved family satisfaction with nursing care

Next Steps/What Should Happen Next:

➢ Provide expanded information regarding patient care teams to resource nurses to facilitate optimal patient assignments

➢ Create automated approaches to determining optimal patient care assignments

➢ Expand analysis to include the relationship between common NICU morbidities and team structure.

Beth Israel Deaconess Medical Center

A teaching hospital of Harvard Medical School

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For More Information Contact
James Gray, jgray @bidmc.harvard.edu
Jane Smallcomb, jsmallco @bidmc.harvard.edu