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CNO-CNIO Vendor Roundtable
Guiding Principles for Big Data in Nursing

Using Big Data to Improve the Quality of Care and Outcomes

Executive Summary

HIMSS Nursing Informatics Community

Big Data Principles Workgroup

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Developed by the HIMSS CNO-CNIO Vendor Roundtable

Overview

An important expanded role for nurses and especially nurse leaders is needed in the strategic planning and implementation of health information technology (IT). Capturing health and care data in a structured way is a critical building block in the foundation to accomplish the vision of accurate, reliable, clinically meaningful measurement across systems and settings of care. Using data elements consistently and reliably will allow for information to be collected once and reused for multiple purposes, including outcomes measurement, practice level improvements, surveillance, population health, research and decision support (Office of the National Coordinator for Health Information Technology [ONC], 2014). Many nurse leaders already have stepped into these roles, but many more will be required in future years. The "Guiding Principles for Big Data in Nursing" represents a welcome opportunity for nurses to lead and diffuse collaborative health IT efforts to improve health and health care quality, safety, and communication among all members of the care team while decreasing costs and increasing value.

Background

The HIMSS CNO-CNIO Vendor Roundtable was formed to optimize health engagement and care outcomes through health IT by leveraging the thought leadership of health IT supplier nurse executive leaders. This pioneer partnership led by HIMSS and including the nursing health IT suppliers depends largely on the ability to move beyond the cultural norms of each partner's organization in the service of innovation to advance outcomes for nursing and clinical practice.

Key objectives are to:

- Serve as an advocate and leader for the nursing community,

- Provide guidance on informatics competencies for nursing, and

- Provide guidance on EHR related topics including analytics, interoperability, usability, terminology, workflow, quality and outcomes.

Today, nursing care data, beyond basic compliance data, is seldom stored electronically, despite studies demonstrating that including nursing problems improves the accuracy of costing healthcare and predicting outcomes (Welton, Halloran, & Zone-Smith, 2006). This means that electronic healthcare documentation contains little data about the decisions nurses make, such as decisions about nursing problems, independent intervention actions, and the resulting outcomes, nursing data will not be used in healthcare planning and priority selections. Therefore, nursing's role in healthcare will remain invisible, and nursing's potential contribution will not be considered in healthcare policy (Thede, 2008).

The paper defines big data guiding principles; explores barriers and challenges; develops a framework for universal requirements; identifies differences in the context of nursing outcomes; addresses the impact of health IT system versions/configurations; analyzes the variation in quality measures; and discusses implementation challenges. This paper also provides the foundation for future discussions with the broader nursing community including nurse executives in hospitals, healthcare systems and other key stakeholder groups to explore and advance shared objectives.

Recommendations
Promote Standards and Interoperability

The ability for nurses to make optimal clinical decisions is dependent upon having access to accurate, real-time information regardless of care setting. Data must also be structured in standard ways to enable sharable, comparable information.

1. Nurses should promote the use of standardized and accepted terminologies that address the documentation needs of the entire care team regardless of care setting. All care delivery settings should create a plan for implementing an ANA-recognized nursing terminology that is mapped to national standards i.e. SNOMED CT or LOINC.

2. Nurses should recommend consistent use of research-based assessment scales and instruments that are standardized through an international consensus body. The lack of standardization makes comparison of data challenging and adds to the burden of cost for copyright permissions and/or licensing of such instruments.

3. The ANA-recognized nursing terminologies should be consistently updated and made available to international standards organizations for translation and complete, comprehensive mapping.

4. Minimize use of free text documentation. When 'within defined limits' is used, discrete data elements should be stored within the EHR to enable decision support, research, analytics and knowledge generation.

Advance Quality eMeasures

Measurement of quality data, including Meaningful Use clinical quality measures and nursing sensitive performance indicators, is a complex process. The data needed to populate these measures come from multiple sources, some of which are not available in the EHR today. Therefore, alignment on the data to be collected, how they are collected, and the terminologies needed to support them is critical to the ability to share data across settings and organizations.

1. Efforts to develop and design quality eMeasures must ensure the data to be collected and measured are aligned with the clinician's workflow, not as additional documentation.

2. To advance nursing sensitive quality eMeasures, paper measure sets must be evaluated for appropriateness, and expectations set for which data should be collected, how the data are collected and the required terminologies to be used.

3. Initiatives and programs that define and promote new quality eMeasures and their requirements should allow time for testing and piloting with defined timeframes that consider all stakeholders.

4. Clinical quality eMeasures must support evidence-based, cost effective care that follows clinical practice guidelines and minimizes the negative impact on clinicians' workflow.

Leverage Nursing Informatics Experts

Nursing informatics is a specialty that integrates nursing science with multiple information management and analytical sciences to identify, define, manage, and communicate data, information, knowledge, and wisdom in nursing practice (ANA, 2015). NI supports nurses, consumers, patients, the interprofessional healthcare team, and other stakeholders in their decision-making in all roles and settings to achieve desired outcomes. This support is accomplished through the use of information structures, information processes, and information technology (ANA, 2015). The application of nursing informatics knowledge is essential to enable capturing health and care data in a structured way to accomplish the vision of accurate, reliable, clinically meaningful measurement across systems and settings of care.

1. Healthcare organizations should utilize nurse informaticists who will provide valuable insight into concept representation, design, implementation, and optimization of health IT to support evidence-based practice, research, and education.

2. To achieve the desired outcomes, nurse informaticists should have formal informatics training, education and certification.

Healthcare organizations anticipate that big data and the use of analytics will reduce escalating healthcare costs and improve the quality of care. The opportunity to capitalize on the vast amount of health and care data that are captured and stored is now a reality. Healthcare organizations are taking on more risk for managing their patient populations and to do so they need more data on how well they are performing including the ability to identify patterns and determine which treatments are most effective for which patients. Cloud computing capabilities have made big data accessible to many organizations. As they consider how to better use this information they will have an eye on new research and evidence-based treatments, including the potential for personalized healthcare.

Big data offers tremendous potential to accelerate the growth and synthesis of new knowledge to make a positive impact on nurses and the individuals and populations they serve. Understanding the principles, barriers, challenges and implications of big data in nursing will help us more rapidly reach the Triple Aim of improving the patient experience of care, improving the health of the population and reducing the per capita cost of healthcare.

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