# Big Data Proceedings

## Capturing Nursing Information for Big Data Research – And Improved Health Outcomes



Proceedings of the Conference:

*Nursing Knowledge: Big Data Research for Transforming Health Care*

August 12-13, 2013

*Sponsored by*
University of Minnesota School of Nursing Center for Nursing Informatics

*Co-sponsors*
Applied Pathways
Minnesota Nursing Informatics Group (MINING)
Healthcare Information and Management Systems Society (HIMSS)

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## Conference Overview

Sponsored by the University of Minnesota School of Nursing and its Center for Nursing Informatics, the *Nursing Knowledge: Big Data Research for Transforming Healthcare* conference brought together stakeholders from nursing practice, education, information technology and informatics and standards organizations.

### Participants Representing

- Informatics Organizations
- Professional Nursing Organizations
- Electronic Health Record Software Developers
- Education and Research
- Federal Government Agencies
- Health Care Delivery Systems

### Steering Committee

- **Connie Delaney, PhD, RN, FAAN, FACMI,** Dean and Professor, University of Minnesota School of Nursing; Co-Director, Clinical and Translational Science Institute – Biomedical Informatics; and Acting Director, Institute for Health Informatics

- **Susan Matney, MS, RN, PhD-C, FAAN,** Nurse Informaticist, 3M Health Information Systems

- **Joyce Sensmeier MS, RN-BC, CPHIMS, FHIMSS, FAAN,** Vice President of Informatics, HIMSS

- **Judith Warren, PhD, RN-BC, FAAN, FACMI,** the Christine A. Hartley Centennial Professor of Nursing, University of Kansas and Assistant Director of the Frontiers Heartland Institute of Clinical and Translational Research Center for Biomedical Informatics

- **John Welton, PhD, RN,** Professor and Dean, School of Nursing and Health Sciences, Florida Southern College

- **Bonnie Westra, PhD, RN, FAAN, FACM,** Associate Professor, University of Minnesota School of Nursing/Institute for Health Informatics and Director, Center for Nursing Informatics

## The Conference Agenda

**Create an action plan for integrating nursing information into big data research**

In August 2013, the University of Minnesota School of Nursing and its Center for Nursing Informatics invited a diverse group of stakeholders to create an action plan to ensure that the knowledge and information that nurses generate as they care for patients and families are integrated into big data that is increasingly the source of insights and evidence to transform healthcare and improve outcomes for patients.

Gathered in Minneapolis for a two-day conference, participants created a collaborative course of action to:

- Integrate nursing information into electronic health records systems

- Implement standardized language to represent nursing diagnoses, interventions and outcomes of care

- Modify and standardize nursing informatics education to build understanding and competences

- Influence policy and standards for documenting and coding nursing information in health care knowledge systems

## The Issue

**Nursing information is not captured in ways that make it sharable and comparable – essential for "big data" research and, ultimately, for improving care.**

Health systems, researchers and providers increasingly look to the vast amounts of data collected via electronic health records to help ascertain trends, identify best practices and improve performance. The value of "big data" – large sets of electronic information available for analysis – has been proven, and its influence is growing. Findings from the analysis of health care information are increasingly shaping policy, establishing best practices and identifying opportunities and processes to address health care access, quality of care and cost.

To date, however, a critical piece of healthcare information has been missing in big data sets: the information generated by nurses as they care for patients and families across the health care continuum.

A number of factors, identified by conference participants, help explain why:

- **Much nursing information is not captured in electronic health records**. It's true that nurses record a great deal of medically focused information – patient demographics, health history, lab tests and procedures – in electronic health records. But they don't capture the assessments, decisions, education and actions they perform to help patients heal while in the hospital, during transitions or recovery outside the hospital to prevent health problems or to promote health.

- **Information is not sharable or comparable.** Nursing information that is being captured in electronic health records is not easy to compare and share – for two reasons.
  - ▶ First, terms are not consistently used when nursing information is entered into electronic systems, thus making comparisons difficult, if not impossible.
  - ▶ Second, the information is not coded with a nationally recognized, standardized language that enables information systems to exchange data across many disparate information systems – and ultimately bring it into "data warehouses" where it can be analyzed and studied.

- **Nursing information is not fully appreciated.** The role that nursing knowledge plays in improving patient outcomes and enhancing the patient experience is currently under-recognized and under-valued.

- **Few nursing faculty are equipped to teach information management, a competency of increasing value in all aspects of health care, including nursing.** Although the American Association of Colleges of Nursing requires competencies in the management of information or "informatics" in the accreditation of bachelor's, master's and doctor of nursing practice programs, most faculty have not been prepared to teach it, a factor that could restrict nursing's ability to participate in information management decisions.

These and other barriers are preventing the integration of nursing knowledge in big data. As a result, health care data remains incomplete, and incomplete data can lead to inaccurate research results, ill-informed policy and misguided care decisions.



Obviously, the situation must change. Once nursing information is entered electronically using terms and codes that can be mapped to a standard computer language capable of sharing data across myriad systems, the possibilities for transforming health care will increase exponentially. Researchers will be better able to create new understanding and provide insights into what actions do or do not improve patient care and outcomes, prevent errors, improve patient experience, streamline workflow and process and reduce costs – all of which are vital to health care's transformation.

# The Action Plan

To begin creating a national nursing knowledge model, conference participants agreed on the need to take action in three key areas: Adopting standards, shaping policy and educating nurses. They outlined many priority actions in each of the areas and assigned responsibility for addressing them:

**Adopting common terminologies and standards**

- Design, build and implement health information systems to comply with regulations and standards. Currently, many computer codes and languages are in use, having evolved in various systems, geographic areas and health fields. While federal agencies designate and maintain certain codes for exchanging health information – RXNorm for medications, LOINC for laboratory data, ICD or SNOMED CT for problems, these codes have not been universally acknowledged or used in nursing.

  Conference participants support building on the existing federal codes for the exchange of health information. Specifically, they recommended nursing's adoption of the SNOMED CT and LOINC codes as national standards for the exchange of nursing information among disparate information systems. Nurses documenting health information at the point of patient care would continue to use any of the American Nursing Association-recognized terminologies.

- Create a central resource for mapping nursing data – particularly assessments, interventions and outcomes – to terminologies. The National Library of Medicine (NLM) already integrates and distributes key terminologies, including nursing terminologies. The NLM also provides subsets of terms, including a SNOMED-CT nursing problem list and terms federally required for reporting clinical quality measures. It is likely that nursing would adopt standardized terminologies faster if the NLM became a central resource for public access of mappings among nursing terminologies and examples of mapping local terms to standardized terminologies.

- Require that coding in information systems accommodate the Nursing Minimum Data Set and the Nursing Management Minimum Data Set data elements. Minimum data sets identify the essential core data that represent a domain of interest such as nursing. These two American Nurses Association-recognized minimum data sets describe the essential clinical and management or contextual data that describe nursing's contribution to – and influence on – health outcomes.

- Incorporate criteria such as those outlined by the Nursing Information and Data Set Evaluation Center (NIDSEC) of the American Nurses Association into criteria for meaningful use certification of electronic health records. NIDSEC criteria specify that standardized nursing terminologies should be used on electronic health records to document data associated with the nursing process – from assessments to care planning and actual care provided. The data should be stored in coded format and be retrievable for evaluating population health.

- Work with information technology vendors to include standardized nursing terminologies in their software, eliminating the need for each health system to map local codes to standards.

- Extend criteria from the *National Database of Nursing Quality Indicators (NDNQI)* to include data across health care settings. Incorporate standardized nursing terminologies and standard nursing minimum data sets in the criteria.

- Share the nursing knowledge model across Clinical and Translational Science Awards (CTSAs) and invite them to join the initiative to include nursing data in CTSA clinical data repositories.

## The Action Plan, continued

**Shaping policy**

- Participate in ongoing development of standards to ensure that patient-centric values and needs expressed through nursing's voice is heard as technologies are developed and implemented. Technology designed for nursing practice won't work unless practicing nurses help guide its development.

- Develop strategies to educate nursing organizations and interprofessional care stakeholders about the value of nursing information, listen to their views and equip and encourage them to speak with one voice as advocates for nursing information in electronic records.

- Empower nurse informaticians to advocate for the use of standardized nursing terminologies.

**Educating nurses, nursing faculty, nurse executives, nurse informaticians and interprofessional care disciplines**

- Support strategies to empower nursing faculty to teach nursing informatics across all levels of education.

- Develop a campaign for educating nursing care providers, executives, students and faculty on the value of capturing standardized nursing data – and on gaining information management skills and competency.



*Standing*, *from left*:
*Marla Weston, Gaye Dolin, Ann O'Brien, Joyce Sensmeier, John Welton, Kathy Bowles, Kathleen McCormick, Tom Clancy, Diane Skiba, Daniel Pesut, Marty LaVenture, Mary Jo Swanson, Marisa Wilson, Karen Monsen, Kathleen Schwarz, Roy Simpson, Jane Kirschling, Kevin Fickenscher, Connie White Delaney, Kathy Sward, Jim Woodburn, Judith Warren, Joanne Disch, Jung In Park*
***Seated,*** *from left: Susan Matney, Lynn Choromanski, Laura Heermann-Langford, Judy Murphy, Barbara Caspers, Bonnie Westra, Erin Grace, Patti Dykes*

## Next Conference

June 5-7, 2014 at the University of Minnesota School of Nursing
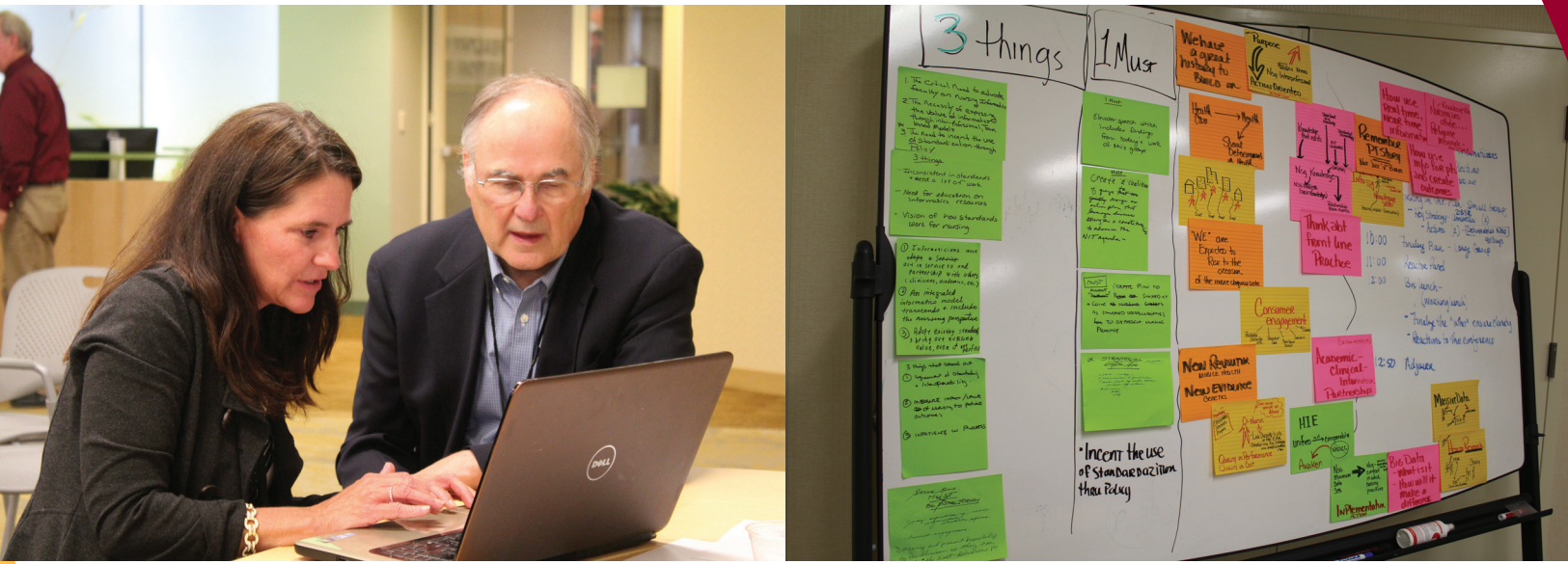
## Call to Action

What can you, as an individual or group, do to help support the plan to ensure that nursing information is captured and integrated effectively with "big data?"

- **Get involved.** Almost all nursing organizations – including the American Organization or Nursing Executives, the National Association of School Nurses, regional research consortia – creating informatics committees. Many are working with the Alliance for Nursing Informatics and the American Nursing Association to address barriers to capturing and using nursing information.

- **Listen, learn, teach.** Informatics is new and, for many, it is not well understood or appreciated. Equip yourself to lead in educating others in this important discipline.

## More Information

To learn more about the vision and challenges of capturing nursing knowledge for big data research and transforming health care, visit the conference website **http://www.nursing.umn.edu/about/calendar-of-events/2013-events/nursing-knowledge-big-data-research-for-transforming-healthcare/Pre-ConferenceMaterials/index.htm** and click on the links to all pre-conference materials.

To learn more about next steps in the action plan, email: **BIGDATA@umn.edu** or visit: **http://z.umn.edu/bigdatapreconference**

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