Nursing Knowledge: 2017 Big Data Science

Conference Proceedings

June 7 – 9, 2017

Minneapolis, Minnesota

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Complete Conference Information
To see the conference agenda, action plans from 2013, 2014, 2015 and 2016, abstracts and presentations,
visit http://z.umn.edu/bigdata

2018 Nursing Knowledge Conference Dates
Nursing Knowledge: 2018 Big Data Science Conference will be held June 13 – 15, 2018, in Minneapolis

Shared Vision:
Why a Nursing Knowledge Conference Series

We share a vision of better health outcomes resulting from the standardization
and integration of the information nurses gather in electronic health records
and other information systems, which is increasingly the source of insights and
evidence used to prevent, diagnose, treat and evaluate health conditions.
The addition of contextual data, including environmental, geographical,
behavioral, imaging, and more, will lead to breakthroughs for the health of
individuals, families, communities and populations.

Improved Patient Care Through Sharable, Comparable Nursing Data

Conference Overview

The fifth annual Nursing Knowledge: Big Data Science Conference brought together more than 150 professionals from academia, practice, research, information technology, health systems and standards organizations from across the nation. Similar to past years, the conference included a convening of active workgroups that met throughout the year to advance multiple aspects of the National Action Plan for advancing nursing knowledge.

Conference participants share a goal of achieving health improvements and efficiencies that will come from ensuring that nursing data is captured in electronic health records and other sources, and that the data is available in sharable and comparable formats supporting useful, actionable insights by clinicians, researchers, policymakers and patients.

The pre-conference offered participants a choice of three tracks: clinical decision support and quality reporting, care coordination, and big data research. Within each of these tracks, presentations focused on the health policy issues, essential data to support nurses and interprofessional partners, and exemplars of successful implementations.

Rebecca Freeman, PhD, RN, FAAN, PMP, chief nursing officer of the Office of the National Coordinator for Health Information Technology at the US Department of Health and Human Services delivered an inspiring keynote address. She stressed that nurses and informaticians must recognize the importance of adopting widely accepted standardized languages and software systems. Thomas Clancy, PhD, MBA, RN, FAAN, presented a look into the future of health care based on emerging technology and the use of robotics in care delivery and assisted living. He stressed the importance of nurses informing the design of robotics and data capture to assure patient safety and outcomes.

Workgroups reported on their achievements, held workgroup meetings, and presented their 2017-2018 plans. Presenters identified progress toward sharable and comparable nursing data from these multiple perspectives. Action plans will be addressed during the year and impact will be reported at the 2018 Big Data conference, which will be held on June 13-15, 2018 at the University of Minnesota.

Connie White Delaney, PhD, RN, FAAN, FACMI, FNAP
Dean, University of Minnesota School of Nursing

Key Notes from the Keynote

Rebecca Freeman, PhD, RN, PMP, the Chief Nursing Officer of the Office of the National Coordinator for Health Information Technology, delivered the keynote address for the Nursing Knowledge conference. She emphasized the importance of maintaining a patient focus supported by a longitudinal, interdisciplinary care plan with everyone speaking the same language to efficiently achieve patient outcomes.

Freeman noted that providers and systems will no longer be reimbursed for process (fee-for-service); rather the focus is on achieving outcomes. Delivery system reform will change the way health care is provided and paid for in the United States. Reimbursement will be based on patient outcomes across the care continuum; optimal outcomes will be achieved through efficient, team-based care that is expertly coordinated across care settings, she said.

The movement of information from one care environment to the next must occur. Nurses are natural care coordinators and an integral part of any patient's health optimization, however, nursing documentation in some care settings is not always sharable and comparable within the team. As care models change, nursing should plan for an interdisciplinary, shared terminology that enables their work and information to be well represented in the data across the continuum. To achieve this, Freeman stressed that we must first change our mindset and behavior before we can institute an efficient care model in the health information technology architecture and expect it to work.

Freeman noted that changing behavior is difficult. Two key changes that need to be made are for nurses to capture more structured data in a standardized way for all health care providers, and to eliminate redundancy from one discipline or unit to another. She encouraged nurses to use interface terminology recognized by the American Nurses Association. To continue to use one-off systems is to risk being left behind. Where data are transmitted from one location to another location that does not the use same terminology, nursing should use SNOMED CT and/or LOINC.

Freeman concluded by highlighting that nurses are the strongest members of the interdisciplinary team; they are leaders in every arena. The challenge continues to be to prove that we belong there, supported by the data.

Rebecca Freeman, PhD, RN, PMP, the Chief Nursing Officer of the Office of the National Coordinator for Health Information Technology

Care Coordination

PROJECT TEAM

Co-Leads

Lori Popejoy, PhD, APRN, GCNS, FAAN, Associate Professor, John A. Hartford Foundation, Claire M. Fagin, Fellow, Sinclair School of Nursing, University of Missouri

Mary Hook, PhD, RN-BC, Research Scientist and Nursing Informatics Specialist, Aurora Health Care

Members

Chelsea Biel
Kathy Bobay
Kyle Carson
Maureen Dailey
Laura Hermann Langford
Sharon Hewner
Diane Holland
Stephanie Johnson
Nicole Kapinos
Kay Lytle
Nancy Madsen
Katy Musterman
Amber Paulus
Dan Pesut
Jill Powelson
Kelly Schneider
Jean Scholz
Christine Spisla
Gregg Springan
Jennifer Steinhaus
Nikki VandeGarde
Bonnie Wakefield
Marianne Weiss
Woody (Jim) Woodburn

PURPOSE

Identify nursing implications related to big data associated with care coordination.

ACCOMPLISHMENTS

Initiated networking with participants including the American Nurses Association's Senior Policy Advisor, who updated the group about national efforts by the Centers for Medicare and Medicaid and the National Quality Forum related to care coordination.

Identified foundational topics for future meetings including multilevel perspectives and complexity theory, interoperability and use of the "master care plan", international data standards, and social determinants with the goal of creating a spreadsheet to capture essential data elements.

Expanded the group to include representatives from electronic health record developers and researchers.

Gathered input of how the group could begin to look at the concept of care coordination graphically and conceptually. Resources reviewed included: Fast Healthcare Interoperability Resources, a draft HL7 standard for describing data formats and elements and the interface for exchanging EHR data (alternative to document-centric approaches); Medicare Access and CHIP Reauthorization Act the federal Office of the National Coordinator efforts to create eMeasures.

Discussed standards and EHR developers' efforts to support data exchange, interoperability, and transitions of care to make the work visible for the care team and the patient. Many ideas were generated confirming the need for a common language and core fields for optimal data sharing.

Reviewed research results of the Patient-Centered Assessment Method, an electronic tool used in the primary care setting for assessing social determinants and creating a plan of care.

Obtained information from the American Association of Medical Groups, provided an update regarding value based reimbursement and how this is impacting primary care and care coordination.

Collaborated with the Value Workgroup to use the "Use Case" template to construct the workflows associated with care coordination.

Submitted applications for membership for National Quality Forum (NQF) Care Coordination Standing Committee but were not selected.

Created "Dropbox" Care Coordination Reference Repository

Preconference Workshop on Care Coordination for annual Nursing Knowledge: Big Data Science Conference

Clinical Data Analytics

PROJECT TEAM

Co-leads

Martha Sylvia, PhD, MBA, RN, Associate Professor, Medical University of South Carolina, College of Nursing

Bonnie L. Westra, PhD, RN, FAAN, FACMI, Associate Professor, University of Minnesota, School of Nursing, Director, Center for Nursing Informatics

Subgroup-Clinical Data Models Co-leads
Tae Youn Kim
Rachel Rickesson

Subgroup-Population Health Informatics Co-leads
Sharon Hewner
Martha Sylvia

Subgroup-Validation of Information Models Co-leads
Steve Johnson
Bonnie Westra

Members
Samira Ali
Vicki Baukner
Karen Bavuso
Kathryn Bowles
Sarah Collins
Christopher Cruz Janet Cuddigan
Fabio D'Agostine
Dianna Dodd
Nancy Dunton
Diana Farm-Franks
Meg Furukawa
Grace Gao
Celestine (Trudy) Gochett
Stephanie Hartleben
Adam Helgren
Maria Hendrickson
Sharon Hewner
Laura Holbrook
Mary Hook

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.

ACCOMPLISHMENTS COMMON DATA MODEL

Refined scope of project to ensure consistency with National Action Plan and other Nursing Knowledge: Big Data Science working groups

Define project plan and expected outcomes
- Discuss strategies for integrating nurse-sensitive data into common data models (CDM) used in multi-site research networks (such as PCORnet and OHDSI).
- Explore nursing problems and diagnoses documented across organizations, examining variation in how and where there are captured in the EHR, and developing process to support organizations to report these into existing data models using SNOMED CT.

ACCOMPLISHMENTS POPULATION HEALTH INFORMATICS

Created the charter/purpose for the group

- 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 include the patient voice in their own care with standardized coding

- Completing a literature review: A Review of Risk Prediction and Segmentation Models Used in the U.S. for Assessing Risk in Whole Populations: Implications for Population Health Nursing

ACCOMPLISHMENTS VALIDATION OF INFORMATION MODELS

Developed and used FloMap software for validation of the Pain Information Model.

Validated the Pain Information Model across 10 organizations: University of Minnesota, School of Nursing/Fairview Health Services; Partners Healthcare Systems; Kaiser Permanente; UCLA Health; Aurora Health Care; Duke University Health System; Cedars-Sinai Health System; Allina Health; North Memorial Medical Center; and Bumrungrad International.

Developed a repeatable process for validation of additional data-derived information models.

Initiated an article on the process and results of the Pain Information Model.

Clinical Data Analytics

Members, continued

Jung In Park
Alvin Jeffery
Steve Johnson
Gail Keenan
Janice Kelly
Rebecca Kohler
Debra Konicek
Anne LaFlamme
Mikyoung Lee
Deborah Lekan
Kay Lytle
Yvonne Mugford
Susan Newbold
Ann O'Brien
Danielle Olds
Kirk Phillips
Lisiane Pruinelli
Tari Rajchel
Maya Ram
Rachel Richesson
Theresa (Tess) Settergren
Deborah Sita
Christine Spisla
Christine Suckecki
Suzanne Sullivan
Puja Upreti
Lois Walters-Threat
Bonnie Westra
Luann Whittenburg
Tamara Winden
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PUBLICATIONS

Matney, S.A., Settergren, T., Carrington, J.M., Richesson, R.L., Sheide, A., & Westra, B.L. (2017). Standardizing Physiologic Assessment Data to Enable Big Data Analytics. Western Journal of Nursing Research, 39, 63-77. doi:10.1177/0193945916659471

Pruinelli L, Delaney CW, Garcia A, Caspers B, Westra B. (2016). Nursing Management Data Set (NMMDS): Cost Effective Tool to Demonstrate the Value of Nursing Staffing in the Big Data Science Era. Nursing Economic$. 34 (2), p66-89

Delaney, C.W., Westra, B.L. (2017). Big Data: Data Science in Nursing, Editorial. Western Journal of Nursing Research 39 (1): 3-4

Matney SA, Settergren TT, Carrington JM, Richesson RL, Sheide A, Westra BL. West J Nurs Res. 39(1): 63-67

Westra, B.L., Sylvia, M., Weinfurter, E.F., Pruinelli, L., Park, J.I., Dodd, D., Keenan, G.M., Senk, P., Richesson, R.L., Baukner, V., Cruz, C., Gao, G., Whittenburg, L, Delaney, C.W. (2017). Big Data Science: A Literature Review of Nursing Research Exemplars. Nursing Outlook. 2016 Dec 8. pii: S0029-6554(16)30396-7

Delaney, CW, Pruinelli, L, Alexander, S, Westra, BL, (2016). 2016 Nursing Knowledge Big Data Science Initiative. Comput Inform Nurs. 2016 Sep;34(9):384-6

Westra, B. L., Christie, B., Johnson, S. G., Pruinelli, L., LaFlamme, A., Sherman, S. G., Park, J.I., Delaney, C.W., Gao, G., Speedie, S. (2017). Modeling Flowsheet Data to Support Secondary Use. *CIN - Computers Informatics Nursing*. https://doi.org/10.1097/CIN.0000000000000350

PRESENTATIONS

Big Data at the Interdisciplinary Level to Improve Care, Summer Institute for Nursing Informatics, University of Maryland, Baltimore, MD, July 2016

Data Driven Research and Health Care. University of Knoxville, College of Nursing, Knoxville, TN, November, 2016

Big Data Analytics for Home Care. Home Healthcare and Hospice Information Technology Conference, Chicago, IL, November, 2016

Modeling Flowsheet Data for Quality Improvement and Research. AMIA 2016 Annual Symposium, Chicago, IL November, 2016

FloMap: A Collaborative Tool for Mapping Local EHR Flowsheet Data to Information Models, AMIA CRI, San Francisco, CA, March 2017

Context of Care

PROJECT TEAM

Co-Leads
Amber Oliver, DNP, RN-BC,
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Corporation

Barbara Caspers, MSPHN, BSN,
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Consultant

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Michelle Dardis
Connie White Delaney
Diana Farm-Franks
Susan Hull
Steve Johnson
Chris Looby
Erin Maughan
Lisiane Pruinelli

PURPOSE
Develop a plan for disseminating the Nursing Management Minimum Data Set and design a study to compare the NMMDS to the Minimum Data Sets used by the National Forum of State Workforce Centers.

ACCOMPLISHMENTS
Continue development of the 2016 test Big Data set to introduce an integrating framework for sharable and comparable nurse data across the care continuum and the foundational data structure that supports the framework, incorporates the Nursing Management Minimum Data Set and links key to conference activities.

Model representation of the framework, with explicit operating assumptions, for integrating sharable and comparable nurse data across the care continuum and all care transitions.

Conceptualize and diagram of the foundational data structure that supports the sharable and comparable nurse data-integrating framework.

PUBLICATIONS
Pruinelli L, Delaney CW, Garcia A, Caspers B, Westra B. (2016). Nursing Management Data Set (NMMDS): Cost Effective Tool to Demonstrate the Value of Nursing Staffing in the Big Data Science Era. Nursing Economic$. 34 (2), p66-89

Englebright J, Caspers B. (2016). The Role of the Chief Nurse Executive in the Big Data Revolution. Nurse Leader. 14(4), p280-284

PRESENTATIONS
The CNE and the Big Data Revolution, Englebright, J.; Caspers, B.; AONE 2016 Annual Meeting: Inspiring Leaders, Fort Worth, TX, March 30-April 2 2016

Nursing Informatics Education

PROJECT TEAM

Co-Leads

Marisa L. Wilson, DNSc, MHSc, RN, Associate Professor and Specialty Track Coordinator Nursing Informatics, University of Alabama at Birmingham

LaVerne Manos, DNP, RN, Program Director Master of Science in Health Informatics, University of Kansas Medical Center, Center for Health Informatics

Members

Murielle Beene
Kathleen Brandt
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Tom Clancy
Alisha Cornell
Ellen D'Errico
Lynda Hardy
Gail Keenan
Susan Newbold
Kirk Phillips
Jana Pownell
Roy Simpson

PURPOSE

To ensure that graduate level nurses and faculty are being exposed to and are able to demonstrate the competencies needed to lead big data science activities in order to benefit nurses, patients and consumers.

ACCOMPLISHMENTS

Started to create a scaffold related to graduate competencies that included topics, description, objectives and resources.

Monitored and commented on the Commission on Accreditation for Health Informatics/ American Medical Informatics Association revision of 2010 Standards for accreditation of programs offering Masters in Applied Health Informatics. Ensure data science, big data, and analytics are included.

Participated in the accreditation process of commission to ensure graduate programs are producing informaticians prepared to lead change in regards to data science and analytics.

Reviewed and commented on competencies for Advanced Health Informatics Certification. Ensure expected competencies were addressed.

Participated in InSpire 2017: Developing the Health Informatics Workforce of the Future Conference.

PUBLICATIONS

Wilson, M.L., Using Outcomes and Performance Improvement Data to Evaluate and Improve Practice. In: Tracy, M.F. O'Grady,E. (editors). Advanced Practice Nursing, 6e. Elsevier; In press

Wilson, M.L., Weaver, C., Procter, P.M., & Beene, M.S. Big Data in Healthcare: A Wide Look at a Broad Subject In: Delaney C, Weaver C, Warren J, Clancy T, Simpson R (editors). Big-data enabled nursing: education, research and practice. London: Springer; In press

PRESENTATIONS

Honey, M., Procter, P.M., Wilson, M.L., Moen, A. & Dal Sasso, G. T. M. (2016). Nursing and eHealth: Are we preparing our future nurses as automatons or informaticians? Panel presented at The 13th International Congress in Nursing Informatics, "eHealth for all: Every level collaboration – From project to realization". Geneva, Switzerland, June 25-29, 2016

Wilson, M.L. "QSEN Aligned Informatics Teaching Strategies Across the Nursing Continuum – BSN, MSN, DNP". QSEN, San Anton, TX, May 2016

Wilson, M.L. "The DNP: Leading Innovation in a Technology Rich Environment". At the DNP Inc conference, Baltimore, MD, Oct. 5, 2016

Encoding and Modeling

PROJECT TEAM

Co-Leads

Susan A. Matney, PhD, RNC-OB, FAAN, Medical Informaticist, Intermountain Healthcare

Tess Settergren, MHA, MA, RN, Director, Nursing Informatics Standards, Cedars-Sinai Health System

Members

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Roxy Rewolinski
Roberta Severi
Amy Sheide
Linda Schwanebeck
Deborah Sita
Christine Spisla
Camila Takao-Lopes
Cyndalynn Tilley
Nikki Vande Garde
Kirsten Vitala
Marisa Wilson
Bonnie Westra
Tae Youn Kim

PURPOSE

Develop and disseminate LOINC and SNOMED CT for electronic health record nursing assessments and incorporate them into a framework and repository for dissemination.

ACCOMPLISHMENTS

Developed LOINC and SNOMED CT content for electronic health record nursing assessments, interventions, and outcomes, and incorporate the content into a framework and repository for dissemination, as well as preparation of models that will inform Clinical Information Modeling Initiative and the Fast Healthcare Interoperability Resources profile projects.

Formed the Data Collection & Analysis Subgroup and formed the Terminology Subgroup

Outlined the data collection and analysis workflow found at http://z.umn.edu/bigdata

Identified flowsheet measures for Peripheral IV/Central Venous Catheter from 7 organizations analyzed and prepared for Terminology group to model and code (to Clinical LOINC and SNOMED CT)—in transition

Submitted new SNOMED Clinical Terms (additional basic physiologic assessments)

Educated Workgroup on Clinical LOINC, SNOMED CT, Modeling, Value Set Authority Center.

Gathered initial compendium of proprietary instruments/assessment tools for LOINC inclusion.

PUBLICATIONS

Matney, S.A., Settergren, T., Carrington, J.M., Richesson, R.L., Sheide, A., & Westra, B.L. (2017). Standardizing Physiologic Assessment Data to Enable Big Data Analytics. Western Journal of Nursing Research, 39, 63-77. doi:10.1177/0193945916659471

PRESENTATIONS

Developing Standardized Nursing Assessments (poster). Matney, S.A., Settergren, T., Westra, B.L., Pruinelli, L. NI2016 International Conference in Nursing Informatics, Geneva, Switzerland, June 2016

Down the Rabbit Hole: Moving Nursing Data from Messy to Measurable. Settergren, T., O'Brien, A., Rewolinski, R. Epic UGM Nursing Advisory Council, Verona, WI, September 2016

Structuring, Encoding, and Messaging Nursing Data. Matney, S.A. Nursing Knowledge: Big Data Science webinar for workgroup leaders and encoding/modeling workgroup, November 2016

From Data to Wisdom. Settergren, T. American Nursing Informatics Association SoCal Chapter Annual Conference, Los Angeles, CA, January 2017

From Data to Wisdom…with Soul. Settergren, T., Matney, S.A. American Nursing Informatics Association Annual Conference, New Orleans, LA, April 2017

Engage and Equip All Nurses in Health IT Policy

PROJECT TEAM

Co-Leads

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

Kari Fitzpatrick Ballou, MSN, RN, CNOR, Informatics Nurse Specialist Association of periOperative Registered Nurses

Members

Kelly Aldrich
Susan Alexander
Kari Ballou
Willa Fields
Valerie Fong
Laura Heermann-Langford
Brenda Kulhanek
Norma Lang
Ellen Makar
Judy Murphy

PURPOSE

Provide nurses with the education, tools and resources to equip them as knowledgeable advocates for policy efforts that are important to nursing.

ACCOMPLISHMENTS

Reviewed, updated and disseminated relevant health IT policy-related educational tools and resources.

- Discussed policy updates post-election.
- Reviewed ANA position on American Health Care Act of 2017.
- Presented and discussed on 21st Century Cures Act Overview and Impact with Samantha Burch, Senior Director, Congressional Affairs, HIMSS.

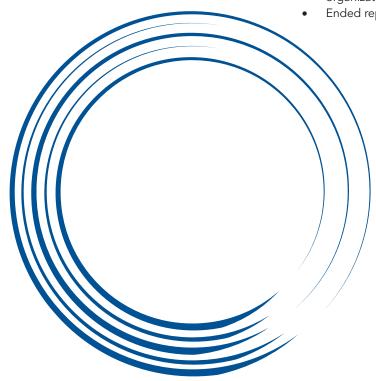Influence the health IT policy landscape

- Continued to identify and leverage key advocacy/leadership opportunities relevant to nursing.

Collaborated on policy efforts with other like-minded professional groups.

- Big Data Nursing Value Workgroup
- American Academy of Nursing Informatics & Technology Expert Panel
- American Nurses Association
- HIMSS
- National Council of State Boards of Nursing
- Nursing and Health Policy Collaborative

Leveraged relevant health IT policy positions for advocacy efforts.

- Assessed environmental landscape for Unique Identifier for Nurses (National Provider Identifier, National Council of State Boards of Nursing ID).
- Met with Big Data Nursing Value Workgroup leaders & National Council of State Boards leaders to explore potential.
- Spearheaded efforts to articulate position statement, increase awareness and advocate for use of a unique nurse identifier, in collaboration with like-minded organizations.
- Ended repository collaboration discussion with University of New Mexico.

Mobile Health for Nursing

PROJECT TEAM

Co-Leads

Christie Martin, MPH, RN, PHN, Abbott Northwestern Hospital, Allina Health, Graduate Research Assistant, University of Minnesota School of Nursing

Lily Tunby, DNP, RN, Clinical Informatics Analyst, Hennepin County Medical Center

Members

Robin Austin	Lisa Janeway
Rhonda Cady	Jane Koenig
Laura Cullen	Elizabeth Meyers
John Deckro	Ramona Nelson
Meg Furukawa	Lisiane Pruinelli
Andrew Hehr	Stesha Selsky
Lex Hokanson	Victoria Tiase
Susan Hull	

PURPOSE

Explore the use of mobile health data and support opportunities to utilize mobile health data within nursing workflows.

ACCOMPLISHMENTS

Discussed mobile health user story - Mobile EHR application for inpatient nursing

Conducted a systematic review - Effectiveness of mobile health application on physical activity in adults

Nursing Value

PROJECT TEAM

Co-Leads

Ellen Harper, DNP, MBA, RN, FAAN President & CEO, Blue Water Informatics LLC

John Welton, PhD, RN, FAAN, Professor & Senior Scientist, Health Systems Research, School of Nursing, University of Colorado

Subgroup Leads

Greg Clancy
Amy Garcia
Cathy Ivory
Peggy Jenkins
Chris Looby
Lisa Moon

PURPOSE

To address the issue of how to measure nursing value and develop new techniques that will provide real-time metrics to monitor quality, costs, performance, effectiveness and efficiency of nursing care.

ACCOMPLISHMENTS

Refined the common data model for demonstrating nursing value and the dictionary.

Completed five user stories.

Received IRB approval for pilot study.

Submitted an R03 application to Agency for Healthcare Quality and Research to fund pilot study for LA Children's hospital, reviewed and received priority of 10 and anticipate funding summer of 2017.

Submitted grant application to University of Colorado Data to Value for funding to setup infrastructure to build a nursing value data repository (pending review).

Nursing Value, continued

PUBLICATIONS

D'Agostino, F., Sanson, B., Cocchieri, A., Vellone, E., Welton, J.M., Maurici, M., Alvaro, R., Zega, M. (2017) Prevalence of nursing diagnoses as a measure of nursing complexity in a hospital setting. Journal of Advanced Nursing 73(9):2129-2142. doi: 10.1111

Welton, J. M., & Harper, E. M. (in press). Using NOC to measure nursing care value in clinical practice. In Moorhead, S., Swanson, E., Johnson, M., Maas, M. L. (Eds.), Nursing Outcomes Classification (NOC): Measurement of health outcomes (6th ed.). St. Louis, MO: Elsevier

Welton, J.M. and Harper, E.M. (in print). Case Study 5.1: Value-Based Nursing Care Model Development. In: Weaver, C., Delaney-White, C.W., Warren, J.J., Clancy, T.R., and Simpson, R.L (Eds.). Big Data-Enabled Nursing: Education, Research and Practice, First Edition. Springer Publishing

Welton, J.M. & Harper, E.H. (2016) Measuring nursing value, In: Sermeus, W., Procter, P.M., Weber, P. (Eds.), Nursing Informatics 2016 eHealth for All: Every Level Collaboration – From Project to Realization, Amsterdam: IOS Press. 13th International Congress in Nursing Informatics, Geneva, Switzerland, June 22-24. Available at: http://ebooks.iospress.nl/volumearticle/43008

Welton, J.M., & Harper, E. (2016) Measuring nursing care value, Nursing Economics, 34(1) 7-14.

PRESENTATIONS

Garcia, A. (2017) Articulating the Value of Nursing, Association of California Nurse Leaders, February 2017

Garcia, A. (2017) Articulating the Value of Nursing, Kansas Sigma Theta Tau Evidence Based Practice Conference, April 2017

Harper, E.H. & Welton, J.M. (2016) Measuring nursing value, *13th International Congress in Nursing Informatics*, Geneva, Switzerland, June 22-24.

Welton, J.M., Measuring nursing value and performance using EHR data. HIMSS – CO chapter meeting, Denver, CO April 25, 2017

Welton, J.M., Kleiner, C., Adrian, B. Practical applications of value-based nursing care using big data. *Western Institute of Nursing Annual Conference*, Denver, CO April 19-22, 2017

Welton, J.M. (2016) Thinking Big: Using Big Data to Advance Patient Care, Nursing Notes Live program for the Johnson & Johnson Campaign for Nursing's Future with Jamie Davis, November 15. https://www.discovernursing.com/nursing-notes/thinking-big-using-big-data-advance-patient-care

Social Determinants of Health

PROJECT TEAM

Co-Leads

Erin D. Maughan, PhD, MS, RN, APHN, FNASN, FAAN, Director of Research, National Association of School Nurses

Susan C. Hull, MSN, RN-BC, Chief Nursing Informatics Officer, Cincinnati Children's Hospital Medical Center

Members

Lynn Choromanski
Nancy Dutton
Amy Garcia
Grace Gao
Sharon Hewner
Madeleine Kerr
Rebecca Makkers
Lisianne Pruinelli
Chelsea Rentmeester Biel
Vicky Tiase
Ruth Wetta

PURPOSE

Develop a toolkit of resources to support the inclusion of social and behavioral determinants of health in electronic health records, including expected requirements for the CMS meaningful use programs.

ACCOMPLISHMENTS

Connection and coordination with several other Big Data groups, including collaboration with Lisa Moon to include social behavioral determinants of health in the user stories (with Amber Oliver, Context of Care workgroup).

Collection of additional resources: bibliography, case studies, and work on the toolkit.

Beginning work on a social behavioral determinants of health roadmap.

PUBLICATIONS

Sullivan, Mistretta, Casucci, & Hewner (2017). Integrating social context into the comprehensive shared care plans: A scoping review. *Nursing Outlook* http://dx.doi.org/10.1016/j.outlook.2017.01.014

Hewner et al. (2017). Integrating social determinants of health into primary care clinical and informational workflow during care transitions. *eGems*, 5(2)

Transforming Nursing Documentation

PROJECT TEAM

Co-Leads
David Boydm, DNP, RN, CNS, RN, Regional Director Nursing Informatics, Kaiser Permanente

Shannon Hulett, MSN, RN, CNL, Manager of Informatics Nurse, Gundersen Health System

Members
Deborah Ariosto
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Judy Effken
S. Hartleben
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Susan Hull
Steve Johnson
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Gordon Moyer
Ann Obrien
Laure Organ
Roxy Rewolinski
Theresa (Tess) Settergren

PURPOSE
Explore ways to decrease the documentation burden and serve up the information already in the electronic health record at the right time in the workflow to support evidence-based and personalized care. Support recommendations from the Institute of Medicine Report: Best Care and Lower Cost to "accelerate the integration of best clinical knowledge into care decisions."

ACCOMPLISHMENTS
Revised goals for the coming year:
- Explore ways to decrease the documentation burden and serve up information already in the electronic health record at the right time in the workflow to support evidence-based and personalized care.
- Support recommendations from the IOM Report, Best Care at Lower Cost - The Path to Continuous Learning Healthcare in America, to "accelerate the integration of best clinical knowledge into care decisions."
- Share and leverage examples of optimizing the EHR with streamlining documentation, utilizing advanced clinical decision support, decreasing the data silos with improved real time dashboards and shared data view and providing evidence to nurses as part of their workflow.
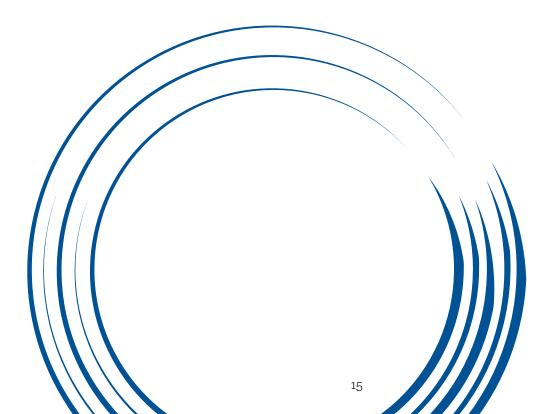
Reviewed terminology-based work by D. Ariosto (CNIO Vanderbilt) on documentation redesign as a 'next steps' launch point for our group.

PUBLICATION
Soriano, R., Chow, M., OBrien, A. *"Leveraging the Power of Inter-Professional EHR Data to Prevent Delirium"* Chapter in: Big Data-Enabled Nursing Education, Research & Practice. Delanie C.W., Weaver, C.A., Warren, C.A., Clancy, T, Simpson, R. (Eds) (In Press)

PRESENTATION
"Down the Rabbit Hole – Moving Nursing Data from Messy to Measurable" Tess Settergren, Ann OBrien, Roxy Rewolinski, Epic Users' Group Meeting Sept 2016

2017-2018 National Action Plan

Care Coordination

PROJECT TEAM

Co-Leads

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PURPOSE

Identify nursing implications related to big data associated with care coordination.

KEY PRIORITIES

Identify essential concepts to support care coordination through the development of use cases for simple and complex care coordination during for transitions.

Share use cases with HL7 to support standards development.

Network with national leaders and organizations to identify opportunities to have input.

PLANNED ACTIVITIES

Use a bottom-up approach with engaged EHR developers and clinical experts to identify essential care coordination data elements.

Develop two use cases with a focus on the concept of pain (one simple short-term acute condition and one complex across multiple) Include settings, providers, and services; identify gaps and publish findings.

Actively engage with HL7 and Office of the National Coordinator to provide national perspective regarding big data needs to support care coordination.

Network with other groups active in care coordination (e.g. HL7, the American Nurses Association, the Care Management Society of America, the American Medical Group Association and the American Academy of Ambulatory Care Nurses.

Clinical Data Analytics

PROJECT TEAM

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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. The work was conducted through three subgroups, with coordination and communication across subgroups by full workgroup meetings.

KEY PRIORITIES

Integrate nurse-sensitive data into population health analytics.

Validate flowsheet information models across multiple health organizations.

Extend current common data models with nurse-sensitive data.

PLANNED ACTIVITIES

Examine what nursing data is included in population health analytics.

Recommend nursing data (i.e., risk assessments) in population health analytics.

Validate information models across multiple health organizations.

Demonstrate use of data science analytic methods that incorporate nurse-sensitive data.

Conduct a baseline query of SNOMED CT nursing problems available in a limited number of PCORI sites.
- Collaborate with PCORnet to integrate nursing problem list and pain concepts into the common data model.
- Disseminate results through presentations and publications.

Context of Care

PROJECT TEAM

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PURPOSE

Demonstrate sharable and comparable nurse data across the care continuum by capturing nursing big data in the Nursing Management Minimum Data Set, the Nursing Minimum Data Set and the Nursing Knowledge: Big Data Science Conference Nursing Value Data Set to increase nurse data usability, provide patient, family and community centric data and, fortify data generated by nurses, about nurses and nursing care across the care continuum and across care transitions in all settings where nurses provide care.

KEY PRIORITIES

Continue collaboration with the Nursing Value, social behavioral determinants of health and encoding and modeling workgroups.

Continue testing the model representation of framework for integrating sharable and comparable nurse data across the care continuum.

Publish results of this workgroup in at least two professional nursing journals.

PLANNED ACTIVITIES

Test the model representation framework for integrating sharable and comparable nurse data across the care continuum and the foundational data structure that supports the model encompassing the Nursing Management Minimum Data Set with a focus on pediatric asthma, patient centered oncology care and pain.

Publish work to date about development of the model and the foundational data structure that supports it.

Disseminate the 2017 Test Kitchen results with emphasis on impacting provider practice and measure influence on the Quadruple Aim.

Education

PROJECT TEAM

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PURPOSE

This workgroup will work to ensure that informatics competencies, educational offerings and learning opportunities for faculty, students and administration meet the requirements of the current health care structure so that nurses can lead at all levels using data and information.

KEY PRIORITIES

Focus on the informatics competencies for the graduate level practice nurse in a non-informatics specialty.

Continue to be involved with the Commission on Accreditation for Health Informatics and Information Management accreditation, Advanced Health Informatics Certification and the Nursing Informatics Program Directors group under AMIA.

PLANNED ACTIVITIES

Educate deans about informatics competencies and selection of appropriate faculty for teaching informatics content.

Informatics Certification and Accreditation.

Update and educate the American Association of Colleges of Nursing, National League for Nursing, Magnet Program, and the American Nursing Association.

Mentor and educate faculty charged with teaching graduate informatics content in non-informatics programs.

Review and revise essentials from American Association of Colleges of Nursing and the National League for Nursing.

Develop content related to Nursing Knowledge output for graduate informatics programs.

Encoding/Modeling

PROJECT TEAM

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PURPOSE

Develop and disseminate standardized content for nursing assessments encoded with LOINC and SNOMED CT and incorporate them into a framework and repository for dissemination.

KEY PRIORITIES

Intensify terminology and modeling focus.

Formalize framework and processes using pain and peripheral IV, CVC

Disseminate deliverables.

PLANNED ACTIVITIES

Content development
- Complete PIV/CVC transition to terminology team for mapping and content creation
- Standardize pain assessment and interventions
- Publish Basic Physiologic Assessment value sets in the NLM value set authority center after terminology group review

Pursue inclusion of proprietary assessment tools in LOINC, with help from the Office of the National Coordinator.

Processes:
- Define the model creation and curation. Create heuristics for data analysis, modeling, coding processes and expand flow diagram.
- Define the content development process for nursing assessments (mapping, requesting, etc.).
- Develop replicable training process for new members.
- Determine how to engage clinical expertise/clinical specialty organizations for content validation (evidence based).
- Develop process for creating information clinical information modeling initiative models.

Work Group Education to highlight SNOMED Clinical Terms this year.

Publications
- Initiate publications subgroup
- Publish articles in specialty journals to engage clinical experts

Engage and Equip all Nurses in Health Information Technology Policy

PROJECT TEAM

Co-Leads

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PURPOSE

Equip nurses with education, tools and resources and engage them as knowledgeable advocates for health IT policy efforts important to nursing.

KEY PRIORITIES

Advocate for use of the unique nurse identifier maintained and supported by the National Council of State Boards of Nursing called the National Council of State Boards of Nursing ID.

PLANNED ACTIVITIES

Unique Nurse Identifier Advocacy
- Vet our position with key stakeholders
- Develop education and awareness plan
- Develop advocacy strategy & position statement
- Spearhead efforts to increase awareness and advocate for use of a unique nurse identifier, in collaboration with like-minded organizations

Mobile Health Data

PROJECT TEAM

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PURPOSE

Explore the use of mobile health data by nurses including both nursing-generated data and patient-generated data. Identify and support activities and resources to address unmet needs and create opportunities to utilize mobile health data within nursing workflows.

KEY PRIORITIES

Explore a real-world example of integrating multiple digital platforms

Assess above project from a variety of nursing perspectives

Investigate current mobile app usage among conference participants and beyond

PLANNED ACTIVITIES

Develop a user story using a real-world, person-centered digital strategy that combines multiple digital platforms

Perform a literature search using a variety of lenses, including: person-centered, community-based, and population-based health/wellness; business; usability and app design; and wellness coaching

Poll conference participants and other nursing informatics leaders regarding their personal health app usage

Nursing Value

PROJECT TEAM

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PURPOSE

Ongoing development of a national consensus model to measure and test patient-level nursing intensity, outcomes and cost across multiple electronic systems and care settings. Develop a multi-site big data research warehouse to support the continuum of care and to produce objective measures of nursing value.

KEY PRIORITIES

Develop big data research expertise among workgroup members by organizing into separate teams which will cover entire process (data mining, data aggregation, data normalization etc.) at each of the three research sites.

Develop and using business intelligence and analytical tools, uncover new nurse value pathways of potential cost saving and improved patient outcomes and identify value contributions of individual nurses.

Design a new multi-site Nurse Value Big Data warehouse to supply relevant data at scale by aggregating site-specific data sets into big data algorithms for new learning.

Define the governance structure at the local health system and big data research policies for Nurse Value Big Data warehouse.

Explore potential policy implications of the nursing value work such as. payment and costing policies, nursing specific contributions to patient outcomes, etc.

PLANNED ACTIVITIES

Conduct pilot study to test the nursing value data model.

Use the initial findings from the pilot study at Children's Hospital of Los Angeles to launch two additional research site studies.

Submit
- R01 (Welton and Harper) in fall 2017 or spring 2018 to AHRQ for multisite (hospital) data to include system level data and analysis of nursing value and patient level nursing costs and nursing intensity outcomes.
- R21 (Welton and Harper) in 2018 to NINR to examine nursing pain assessment, changes in patient acuity using NOC scores and patient outcomes.
- Disseminate findings from initial pilot study as series of published articles and presentations.
  - AONE 2018 submission for presentation
  - Academy Health 2018 submission for presentation
  - Nursing Microcosting model submission planned for Nursing Economics (July 2017 submission) Initial cost study outcomes as article submission to Nursing Economics or Journal of Nursing Administration

Determine how best to approach health systems, venues of care and electronic systems to test the methodology to "share and compare" nursing data across different settings and electronic health records software.

Focus for the coming year will emphasize research, data governance and developing analytic models to measure nursing value and compare nursing care across different care settings.

Social Behavioral Determinants of Health

PROJECT TEAM

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PURPOSE

Support the inclusion of social and behavioral determinants of health in electronic health records, and empower nurses to use the data when planning and providing care.

KEY PRIORITIES

Harmonize mapping of social and behavioral determinants of health.

Complete two user stories.

Engage others and complete roadmap.

PLANNED ACTIVITIES

Analyze current tools to determine overlaps, reliability/validity of tools, collection methods, and mapping of data points with standard language (SNOMED).

Two user stories include use of the Omaha System terminology and consider a second user story about pain or addiction.

Identify database requirements and sources for the test kitchen.

Complete the road map that includes shareable comparable longitudinal care plan, contextualized with dynamic social behavioral determinants of health, interoperable, actively contributing to co-production and learning health system.

Complete publications.

Continue to add resources for toolkit, one element of roadmap.

Transforming Documentation

PROJECT TEAM

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PURPOSE

Explore ways to decrease the documentation burden and serve up the information already in the electronic health record at the right time in the workflow to support evidence-based and personalized care. Support recommendations from the IOM Report, Best Care at Lower Cost - The Path to Continuous Learning Healthcare in America, to "accelerate the integration of best clinical knowledge into care decisions."

KEY PRIORITIES

Reach out to "first tier" groups to discuss convergence such as clinical data analytics, care coordination, pain.

Gather recent best practices and redesign use cases/tools.

Review the literature and select a science-based model to organize the work.

PLANNED ACTIVITIES

Continue refining workgroup's focus on documentation redesign beyond 'reducing clicks' but focuses on enhancing nursing documentation and workflows and outputs that are: evidence-based, timely, smart, intuitive, actionable, and shareable.

Develop and disseminate a definition of Precision Nursing.

Partner with the repository Subgroup to align exemplars with the concept of Precision Nursing.

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For the latest information on the
National Action Plan, visit
http://z.umn.edu/bigdata

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2017 conference attendees

The 2018 Nursing Knowledge: Big Data Science Conference
will be held June 13-15, 2018, in Minneapolis.