

Evidence-based Standardized Care Plans for Use Internationally to Improve Home Care Practice and Population Health

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Keywords

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Summary

Objectives: To develop evidence-based standardized care plans (EB-SCP) for use internationally to improve home care practice and population health.

Methods: A clinical-expert and scholarly method consisting of clinical experts recruitment, identification of health concerns, literature reviews, development of EB-SCPs using the Omaha System, a public comment period, revisions and consensus.

Results: Clinical experts from Canada, the Netherlands, New Zealand, and the United States participated in the project, together with University of Minnesota School of Nursing graduate students and faculty researchers. Twelve Omaha System problems were selected by the participating agencies as a basic home care assessment that should be used for all elderly and disabled patients. Interventions based on the literature and clinical expertise were compiled into EB-SCPs, and reviewed by the group. The EB-SCPs were revised and posted on-line for public comment; revised again, then approved in a public meeting by the participants. The EB-SCPs are posted on-line for international dissemination.

Conclusions: Home care EB-SCPs were successfully developed and published on-line. They provide a shared standard for use in practice and future home care research. This process is an exemplar for development of evidence-based practice standards to be used for assessment and documentation to support global population health and research.

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1. Background

Standardized terminologies (vocabularies) have potential to enable information exchange across populations and settings. They are defined as “a set of standardized terms and their synonyms that record patient findings, circumstances, events, and interventions with sufficient detail to support clinical care, decision support, outcomes research and quality improvement” [1]. Nursing scholars have led development of standardized interface terminologies since the 1970's. Currently, computer applications are driving widespread adoption of these terminologies to describe health assessments and health care interventions [2, 3]. However, unless standards are used consistently across settings, data generated during clinician documentation are not likely to be comparable [3, 4]. To enable optimal information exchange and meaningful use of data in research and program evaluation, standardized terminologies must also be used systematically to describe standards of care consistently across settings. Such efforts to promote evidence-based health care are essential to maximize clinician influence on population health outcomes. Disseminating research findings to practice settings is a daunting task [5]. Low success rates have been reported from passive dissemination such as publications and presentations. More effective approaches such as verbal reminders and educational outreach are needed in order to change practice behaviors of clinicians and other health care professionals [6, 7]. However, these solutions are labor and cost-intensive, and are thus unrealistic in a resource-constrained health care environment. The EHR offers new opportunities to disseminate research through evidence-based standardized care plans (EB-SCPs). The objective of this project was to develop home care EB-SCPs for use internationally to improve home care practice and population health.

1.1 Definitions

This article describes a method used by the participants for developing evidence-based standardized care plans for purposes of translating and widely disseminating best practices. The definitions that follow are proposed by the authors specifically for this method. A standardized care plan (SCP) is defined as a pre-determined menu of interventions for a particular patient situation. Translation is defined as depicting intervention evidence accurately and with sufficient granularity to ensure that an intervention can be delivered with fidelity. Interface terminology is defined as a recognized EHR standard that enables clinicians to use computers for data capture through documentation. Granularity is defined as level of detail. Dissemination is defined as wide-spread adoption of evidence-based practice.

1.2 Use of Interface Standards in the EHR

The EHR is an optimal platform for communicating evidence-based practice during each instance of clinician documentation [8]. To leverage this resource, evidence-based interventions can be embedded within the EHR as a form of clinical decision support, using interface terminologies that enable standardized intervention documentation [3]. The American Nurses Association recognizes 12 terminologies, including 4 that are used broadly as interface terminologies [9]: the Omaha System [10–12], the Nursing Intervention Classification (NIC) [13], the International Classification for Nursing Practice (ICNP) [14], and the Clinical Care Classification (CCC) [15].

1.3 The Omaha System

The Omaha System was selected for this project by the participants because it has been or will be used in community care settings in all participating countries (Buurtzorg Nederland, the Netherlands; Clinician Maude, Christchurch, New Zealand; province of Alberta, Canada; multiple agencies, USA). The Omaha System was developed over 3 decades of federally funded research, and designed from its inception to be amenable to automation and to be used by all health care disciplines [11]. The Omaha System is a valid, reliable interface terminology that enables users to document assessments and services within the EHR. In addition, it is a comprehensive, holistic assessment tool with binary items defining 42 health concepts in environmental, psychosocial, physiological, and health

related behaviors domains. The semantic structure of the Omaha System is a systematic architecture or model for documenting, organizing, and storing clinical data [11]. It passed the Healthcare Information Technology Standards Panel (HITSP) Tier 2 selection criteria for Use Cases in 2007 and is integrated into the National Library of Medicine's Metathesaurus; CINAHL; ABC Codes; NIDSEC; Logical Observation Identifiers, Names, and Codes (LOINC®); and SNOMED CT®. The Omaha System is registered (recognized) by Health Level Seven (HL7®), and is congruent with the reference terminology model for the International Organization for Standardization (ISO) [12]. It is being mapped to International Classification of Nursing Practice (ICNP®) [14]. The Omaha System has 3 components: the Problem Classification Scheme, the Problem Rating Scale for Outcomes, and the Intervention Scheme [10]. A brief description of each component is provided below as a context for the detailed analysis of EB-SCP development process.

The Problem Classification Scheme logically classifies health information into 42 non-overlapping concepts (called "problems") each of which is identified by a unique definition and signs/symptoms. Agencies or groups of agencies create standardized patient assessments using the Omaha System for a patient population (e.g. frail elders) or individuals with a particular condition (e.g. asthma) [10, 16, 17].

The Problem Rating Scale for Outcomes consists of 5-point Likert-type ordinal rating scales for the dimensions of knowledge, behavior, and status for each problem. The Problem Rating Scale for Outcomes is used in conjunction with the Problem Classification Scheme, permitting the assessment of patient knowledge, behavior, and status for every Omaha System problem addressed with a patient. Scores range from 1 (most negative) to 5 (most positive). Problems are typically rated at admission and discharge [10].

Interventions in the Omaha System are related to a specified problem and have 3 additional levels in the hierarchy of intervention terms: category, target, and care description. There are 4 categories (action terms): teaching, guidance, and counseling (TGC); treatments and procedures (TP); case management (CM); and surveillance (S). There are 75 defined target terms that serve to further define the intervention action or patient need. Problem, category, and target terms can be used together in any combination, for a total of 12,600 possible interventions. In addition, the care description level can be customized to describe specific program or patient characteristics. This enables a high level of granularity while maintaining a rationally determined, knowable data architecture. The Intervention Scheme is the instrument used in this project to construct standardized care plans.

1.4 Omaha System Standardized Care Plans

Clinicians are expected to evaluate patient situations and provide appropriate care based on their clinical assessments. Documentation involves recording their assessments and interventions using the standardized terminology. Documentation of interventions in the EHR is facilitated by SCPs, pre-determined menus of interventions for particular patient situations that enable rapid selection of the interventions provided during a patient encounter. Because the Omaha System has 12,600 possible interventions (combination of problem-category-target terms), selecting from a pre-populated SCP template greatly increases speed and ease of documentation. Intervention tailoring is captured through the use of SCPs because the clinician selects only the applicable interventions, and can add others if necessary. Over 150 examples of Omaha System SCPs for various patient populations and conditions are available on-line at the Minnesota Omaha System Users Group web site (omaha-systemmn.org) [18].

There is precedent for disseminating evidence in EB-SCPs in hospital EHRs [19–20] and community setting EHRs [21]. Both Minnesota and Washington State public health clinicians have developed standardized care plans to translate and disseminate standards of care for individual and community level asthma care, family home visiting programs, children with special health care needs, and early intervention programs for child maltreatment [18]. An example of the method as used to develop an EB-SCP for an asthma intervention is described herein because it informed the process for the home care international pathways in the current project. In the asthma project, state asthma program officials worked together with respiratory therapists, public health clinicians, certified asthma educators, environmental health specialists and nursing graduate students to create asthma care EB-SCPs for home visiting using the Omaha System [17]. The purpose of this asthma SCP was to

provide a standard of care and documentation template for public health clinicians providing home visits to children with uncontrolled asthma symptoms. The EB-SCP illustrates several issues related to the development of SCPs. An iterative process of incorporating evidence from national asthma care guidelines and other scientific literature followed by practical review was repeated until all participants reached consensus on granularity, accuracy, and completeness of the asthma EB-SCP. The Omaha System was selected for this asthma EB-SCP because many public health departments in Minnesota use the Omaha System in EHRs. The asthma EB-SCP is presented in its entirety to illustrate several methodological issues related to the development of an EB-SCP (► Table 1) [17].

1.5 Problem Selection

When using the Omaha System to develop an EB-SCP, the first step is to select the problem or problems that will be assessed pertaining to the patient population, condition, or program represented in the SCP. Problems are selected that

- a) enable a comprehensive, holistic assessment of the condition,
- b) best describe program goals, and
- c) enable capture of the desired program outcomes.

In the Intervention Scheme, both problem and target terms can be used to represent intervention content. Use of the problem term enables outcome data collection. Thus, problem selection vis a vis patient population, condition, and program is an essential first step for any EB-SCP project. In contrast, use of the target term enables more granularity of intervention description. Health problems are rarely independent concepts. For example, a circulatory problem (e.g. congestive heart failure) is often related to a respiratory problem (e.g. shortness of breath). Use of problem and target terms together enables precision documentation of interventions (e.g. Circulation-surveillance-signs/symptoms medical-shortness of breath) while prioritizing outcomes measurement (Circulation status) [10].

Note that there are 3 problems in the asthma EB-SCP: Respiration, Sanitation, and Substance use (► Table 1). These problems are important aspects of asthma in 3 domains: Respiration is the major physiological problem, Sanitation is the major environmental problem, and Substance use (environmental tobacco smoke) is a major behavioral problem. While several other problems could be incorporated within the assessment standard and SCP, these 3 problems were prioritized by program clinicians as those that would best describe asthma-related needs of the children with uncontrolled asthma symptoms, match the program's goals, and capture data regarding the desired program outcomes. Different problems may be selected by clinicians working with the same patient population in different settings or programs. For example, the Medication regimen problem was not selected for outcome measurement for the in-home asthma EB-SCP. Instead, medication administration target terms were used with the Respiration problem. In contrast, a primary care provider in a clinic setting may focus on the Respiration and Medication problem, using targets related to home and environment. This choice reflects the focus of each program, with emphasis on environmental assessments in a home visiting program, vs emphasis on medication-related interventions in the clinical setting.

1.6 Intervention Menus

The second step was to create intervention menus (EB-SCPs) related to the selected problems. The interventions are intended to describe the agency's standards of care, encompassing the scientific evidence, clinical expertise, and agency policies [10]. Each Omaha System intervention consists of 4 linked terms (problem-category-target-care description) as described in ► section 1.3. Referring to ► Table 1, there are 28 interventions in the asthma EB-SCP. The Respiration problem has 14 interventions, the Sanitation problem has 11 interventions, and the Substance use problem has 3 interventions. For the Respiration problem there are 3 surveillance interventions; 2 case management interventions; and 9 teaching, guidance, and counseling interventions. These 14 Respiration interventions include 11 different target terms. For the Sanitation problem there are 7 surveillance interventions and 4 teaching, guidance, and counseling interventions. These 11 Sanitation interventions include 2 target terms. For the Substance use problem there are 2 case management interventions and

1 surveillance intervention. These 3 Substance use interventions include 2 targets terms (► Table 1). The 28 interventions serve as clinical decision support reminders within a documentation template.

1.7 Clinical Decision Support

The EB-SCP is intended to provide a comprehensive selection of intervention choices that both
a) serve as reminders (clinical decision support) and
b) facilitate documentation of care.

An important distinction is that the EB-SCP is not intended to be prescriptive, nor a lengthy, detailed description of care. Rather, the skilled clinician should receive training in evidence-based practice guidelines, and thereafter use the EB-SCP for documentation of patient care. This feedback loop serves to reinforce evidence-based practice with every clinical encounter. By selecting pertinent interventions from the EB-SCP, the data demonstrate how clinicians tailor care to meet the individual needs of each patient [22].

1.8 Granularity

The level of intervention detail is referred to as granularity (higher granularity = more detail). Note that problem-category-target combination of Sanitation-surveillance-environment was used 7 times in the SCP to support the environmental surveillance of 7 types of asthma triggers (► Table 1). This high level of granularity is an example of translating specific sections of a standardized in-home environmental assessment for detailed documentation purposes. An alternative, less granular method for representing environmental surveillance would be a single surveillance intervention that refers to a specific in-home environmental assessment checklist (i.e. "Sanitation-surveillance-environment-asthma-trigger checklist"). The asthma project team deemed that the high level of granularity provided by including 7 interventions was best to ensure that the asthma SCP provides enough information detail to support a thorough clinician environmental assessment, improve patient health, and generate granular intervention data regarding that assessment.

Omaha System EB-SCPs have been developed using this method locally for select populations and health problems, and are available on-line at omahasystemmn.org [18]. There is a need to expand beyond local projects and programs to incorporate an international perspective in evidence-based standards of care.

2. Objectives

The purpose of our long-range program of comparative effectiveness research is to evaluate the effectiveness of home care nursing practice, propose new evidence-based practices, test them in prospective trials, and widely disseminate our findings in the public domain using EB-SCPs. Our long-range goal is to improve health and prevent hospital readmissions of elderly and disabled home care patients through improving care. The objective of this project was to develop evidence-based standardized care plans (EB-SCP) for use internationally to improve home care practice and population health.

3. Methods

A technology enhanced participatory clinical-expert and scholarly method developed by the authors and consisting of 7 steps was employed in this project, based on the approach described above for the asthma EB-SPC. First, clinical and scholarly experts were identified and recruited from an international home care audience. Participants were 4 groups of clinical experts from Canada, the Netherlands, New Zealand, and the United States; 8 University of Minnesota School of Nursing graduate students; and 2 faculty researchers. Participants had a range of 15–25 years of experience in community care, home care, and long term care settings. They self-selected into this project because of their

interest in using the Omaha System to improve home care practice. These participants remained stable throughout the project. Second, the clinical experts identified 12 health problems common among elderly and disabled patients as the basis of a home care assessment that should be used for all patients (► Table 2). Third, based on the findings of step 2, graduate students reviewed the literature on home care practices for the 12 problems. All participants contributed evidence through literature searches, clinical expertise, and research findings. Fourth, a group meeting involving clinical experts, graduate students, and Omaha System experts was convened to write EB-SCPs using the Omaha System. The graduate students evaluated the quality of the literature included in the review, synthesized the evidence, and proposed interventions for the 12 problems based on their findings. These interventions were reviewed by participants during an 8 hour face-to-face meeting, with representatives from the Netherlands, New Zealand, and the United States attending. Issues of cultural appropriateness, overlap in interventions between problems, and consistency in approaches across problems were addressed. Fifth, the EB-SCPs were posted on-line and a public comment period was announced to the Omaha System list serv. Sixth, public comment was incorporated, and an international conference call was held to review the revisions and reach consensus. The EB-SCPs were then revised and posted on-line for public comment a second time. During another international conference call a month later, the EB-SCPs were revised and finalized by the participants. Finally, the EB-SCPs were posted on-line for international dissemination as standards of care, clinical decision support reminders, and documentation templates.

4. Results

The final result of this project was a set of 12 home care EB-SCPs that are consistent with the evidence and grounded in practice. The EB-SCPs and related references are available on-line [23–24]. They can be used in a computerized system that employs structured documentation of clinician notes, and are also formatted as a word document as a template for paper documentation (see ► Table 3 for the EB-SCP for the Medication regimen problem and format example). This format was developed previously by the Washington State Children with Special Health Care Needs program. It was devised to enable paper documentation for local jurisdictions that did not have computerized documentation systems [18].

5. Discussion

In this project, a method was explicated for developing EB-SCPs that can serve as agency standards of care, clinical decision support reminders, and clinical documentation templates. The EB-SCPs developed in this project are or will be used to guide and document practice in home care agencies in Canada, the Netherlands, New Zealand, and the United States.

Several issues became evident during the project, including developing a problem list for a basic home care assessment, synthesizing literature to develop the EB-SCPs, representing home care practice using structured terminology in the EHR, and incorporating multiple cultural perspectives within a single standard of care.

The decision to include 12 of the 42 Omaha System problems in the home care EB-SCPs illustrates a critical consideration for problem selection in EB-SCP development: to efficiently capture optimal data without creating a documentation burden. The tension between the needs for complete documentation and efficiency in documentation are noted in the literature, with consensus that it is best to require assessment of the fewest problems needed to portray an accurate picture of the patient's condition [10]. If the minimal problem set assessment approach is adopted, it is essential for documentation systems to allow flexibility in adding other problems as needed so that the EHR does not limit clinician assessments for unique patient situations. The 12 problems are a starting point, and are not intended as a complete and comprehensive home care resource. Currently project participants are developing additional EB-SCPs for additional Omaha System problems (e.g. Pain and Personal care). The need to add these 2 problems illustrates the need for flexibility and adaptation in the development and revision of EB-SCPs [16].

The literature that supports the EB-SCP often applied to many complex problems and interventions. The evidence therefore could not be explicitly linked to a particular problem or intervention. Instead, the evidence was synthesized and applied across problems. Thus, references for the 12 EB-SCPs are compiled in a single comprehensive reference list, and are not annotated within each EB-SCP. This method limits the ability of prospective users to evaluate how the evidence was incorporated within the EB-SCPs. An alternative approach would be to create EB-SCPs directly from published standards of care or clinical guidelines, allowing for a clear link between the evidence and the EB-SCP. If this alternative approach were employed, it would be possible to state the levels of evidence for the standard or guideline. A drawback of this approach is the large gaps in practice that are not addressed by published standards or guidelines.

Another challenge of knowledge representation in EB-SCPs is depicting the *way-in-which* interventions are delivered. The literature addresses relationship-based caregiving, with therapeutic use of self in a caregiving context acknowledged as a best practice. Such psychosocial concepts are rarely represented within the empirical worldview of the EHR [25]. In this project, investigators were aware of the need to ensure that the EB-SCPs represented both the empirical evidence and the therapeutic relationship approach known to optimize patient outcomes. For example, interventions related to coping skills, social support, and emotional support are present in many of the care plans [23–24].

EB-SCPs are not prescriptive, such that all interventions must be implemented in any given situation. Instead, EB-SCPs are prompts that provide clinical decision support reminders to the clinicians. Clinicians must be the drivers of care, incorporating the evidence as well as their clinical knowledge and their assessments in the patient encounter as they tailor care to meet patient needs. No patients or clinical situations are exactly alike. Any evaluation efforts should take these factors into account. Data from use of EB-SCPs will provide opportunities to evaluate use of care standards relative to patient outcomes as they are applied in patient care. These data may also inform and future revision of EB-SCPs. In addition, use of the same EB-SCPs in diverse national contexts will provide a unique opportunity to examine the affects of health care policy on patient outcomes.

This project reflects the perspectives of participants in 4 countries, as well as the evidence in the literature from these countries. Several unique practices and emphases from each country were discussed and successfully incorporated within the EB-SCPs. The resulting care plans serve as a starting point for continued development of home care practice standards and care plans in other countries and settings. Further research involving stakeholders in the international informatics community is needed to evaluate applicability in a wide range of countries. The next phase of this project is to test the EB-SCPs in practice settings in studies evaluating their use and resulting care quality and patient outcomes.

6. Conclusions

An international group of clinicians and scholars developed evidence-based standardized care plans for home care. These care plans serve as evidence-based standards of care, documentation templates, and clinical decision support reminders. Use of the care plans is intended to reinforce excellence in practice that is tailored by the clinician to meet individual patient needs. The care plans are available on-line for use by any home care agency [23].

Clinical Relevance Statement

This project could have relevance for developing EB-SCPs that could address any health care problem. The use of EB-SCPs and their resulting data will have potential to change health care delivery, data collection, program evaluation, and health care quality research in the future.

Conflict of Interest

The authors declare no conflict of interest related to this research.

Human Subjects Protections

Approval was obtained from the University of Minnesota Institutional Review Board. No human subjects were involved in the project.

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Table 1 Asthma Evidence-based Standardized Care Plan [17]

Problem	Category	Target	Care Description
Respiration	S	Continuity of care	Adherence to asthma action plan
		Durable Medical Equipment	Use of peak flow meter, nebulizer, inhaler and holding chamber
		Signs/Symptoms-Physical	Chest tightness, wheezing, cough, shortness of breath, sleep
	TGC	Durable Medical Equipment	Peak flow meter, nebulizer, inhaler and holding chamber
		Wellness	Annual influenza vaccine, exercise, handwashing
		Signs/Symptoms-Physical	Individual triggers: viral infection, allergies, emotions/stress, exercise
		Environment	Air Quality Index; Pollen counts
		Anatomy/physiology	Pathophysiology of asthma
		Signs/Symptoms-Physical	Evidence of Disease/Infection: Signs and symptoms of asthma
		Exercises	Regular physical activity
	CM	Medical/Dental Care	Coordination Among Providers: Primary care, asthma care specialist, allergist, school clinician
		Other community resources	Financial, housing, transportation, health insurance, educational support, tenants rights
TGC	Environment	Relationship to disease	
Sanitation	S	Environment	Mold and moisture
			Pests such as rodents, cockroaches
			Feathery and/or furry pets (cat, dog, bird, hamster, other)
			Dust, excess clutter
			Consumer products such as cleaning products personal care products, fragranced products, and ozone air cleaners
			Odors
			Supplemental Heating Sources such as wood burning stove, fireplace, unvented kerosene or gas space heater
	TGC	Durable Medical Equipment	Products to reduce environmental triggers include bed and pillow encasements, HEPA vacuum cleaner, portable HEPA air cleaner, furnace filters, dehumidifiers
S	Environment	Cleaning and vacuuming (frequency and proper technique)	
		Integrated pest management, health effects of pesticides	
	Emphasize environmental triggers in bedroom		
Substance use	S	Substance use cessation	Use pattern
		Environment	Environmental tobacco smoke
	CM	Other community resource	Telephone information/reassurance: direct referrals may be made to smoking cessation programs on behalf of clients

Table 2 Problems Selected for the International Home Care Evidence-based Standardized Care Plan [23]

Problem	Definition
Abuse	Child or adult subjected to nonaccidental physical, emotional, or sexual violence or injury. (Martin, 2005, p. 219)
Caretaking/parenting	Providing support, nurturance, stimulation, and physical care for dependent child or adult. (Martin, 2005, p. 208)
Circulation	Pumping blood in adequate amounts and pressure throughout the body. (Martin, 2005, p. 277)
Medication regimen	Use or application of over-the-counter or prescribed/recommended medications and infusions to meet guidelines for therapeutic action, safety, and schedule. (Martin, 2005, p. 350)
Mental Health	Development and use of mental/emotional abilities to adjust to life situations, interact with others, and engage in activities. (Martin, 2005, p. 199)
Neglect	Child or adult deprived of minimally accepted standards of food, shelter, clothing, or care. (Martin, 2005, p. 214)
Neuro-musculo skeletal function	Ability of nerves, muscles, and bones to perform or coordinate specific movement, sensation, or regulation. (Martin, 2005, p. 263)
Nutrition	Select, consume, and use food and fluids for energy, maintenance, growth, and health. (Martin, 2005, p. 323)
Residence	Living area. (p.175)
Respiration	Inhaling and exhaling air into the body and exchanging oxygen. (Martin, 2005, p. 270)
Skin	Normal covering of the body. (Martin, 2005, p. 258)
Substance use	Consumption of medicines, recreational drugs, or other materials likely to cause mood changes and/or psychological/physical dependence, illness, and disease. (Martin, 2005, p. 337)

Table 3 Evidence-Based Standardized Care Plan for the Medication Regimen Problem [23] This Medication regimen EB-SCP is one of 12 EB-SCPs developed for home care practice. Assessment components include knowledge, behavior, and status ratings in the first row, and signs/symptoms of Medication regimen problems in the left column. A menu of 16 evidence-based interventions is provided in the remaining rows, with a space to document free text related to each intervention, in a category-target-care description format. Each row is 1 intervention.

Medication regimen																			
K	1	2	3	4	5	B	1	2	3	4	5	S	1	2	3	4	5	Not Applicable or Unable to Address Today (circle one)	
<input type="checkbox"/> does not follow recommended dosage/schedule <input type="checkbox"/> evidence of side effects/adverse reactions <input type="checkbox"/> inadequate system for taking medication <input type="checkbox"/> improper storage of medication <input type="checkbox"/> fails to obtain refills appropriately <input type="checkbox"/> fails to obtain immunizations <input type="checkbox"/> inadequate medication regimen <input type="checkbox"/> unable to take medications without help <input type="checkbox"/> other	CM						medication coordination/ordering						Coordination among providers						
	CM						medication coordination/ordering						Resources to obtain needed medications						
	S						medication action/side effects						adverse events, therapeutic effects, allergies, interaction						
	S						medication administration						follows correct dose, technique, and schedule						
	S						medication coordination/ordering						medication reconciliation, review of all prescribed and other medications						
	S						medication coordination/ordering						checking for high risk medications for age/condition (e.g. Beers Criteria)						
	S						signs/symptoms mental/emotional						ability to make judgments related to medication adherence						
	S						signs/symptoms physical						manual dexterity and physical acuity						
	S						laboratory findings						to guide dose of medication (e.g. glucose, INR)						
	TGC						medication action/side effects						purpose and benefit						
	TGC						medication administration						follows correct dose, technique, and schedule						
	TGC						safety						adverse events, therapeutic effects, allergies, interaction						
	TGC						equipment						home therapy, monitoring, or infusion equipment (e.g. IV pump, insulin pump)						
	TP						medication administration						correct dose, technique, and schedule						
	TP						medication set up						correct dose, technique, and schedule						
	TP						specimen collection						medication-specific diagnostic test						

K = knowledge, B = behavior, S = status
 CM = case management, S = surveillance, TGC = teaching, guidance, and counseling, TP = treatments and procedures

References

1. American Medical Informatics Association and AHIMA Terminology and Classification Policy Task Force. Healthcare terminologies and classifications: An action agenda for the United States. *Perspectives in Health Information Management*, November 13, 2006. [Internet]; 2006. Available from: www.ahima.org.
2. Westra BL, Delaney CW, Konicek D, Keenan G. Nursing standards to support the electronic health record. *Nurs Outlook*. 2008; 56(5): 258, 266.e1.
3. American Health Information Management Association. Meaningful use vocabulary toolkit. [Internet]; 2010. Available from: http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_048346.pdf
4. Monsen KA, Westra BL, Yu F, Ramadoss VK, Kerr MJ. Data management for intervention effectiveness research: Comparing deductive and inductive approaches. *Res Nurs Health* 2009; 32(6): 647–656.
5. Institute of Medicine. *Crossing the Quality Chasm: A new health system for the 21st century*. Washington DC: National Academy Press; 2001.
6. Finfgeld-Connett D. Generalizability and transferability of meta-synthesis research findings. *J Adv Nurs* 2010; 66(2): 246–254.
7. Scott SD. Getting research into practice: Which strategies work? *Nursing for Women's Health* 2008; 12(3): 204–207.
8. Rutherford M. Standardized nursing language: What does it mean for nursing practice? *The Online Journal of Issues in Nursing* 2008; 13(1).
9. ANA recognized terminologies and data element sets. [Internet]; 2010. Available from: <http://nursingworld.org/npii/terminologies.htm>.
10. Martin KS. *The Omaha System: A key to practice, documentation, and information management*. Reprinted 2nd Ed. Omaha, NE: Health Connections Press; 2005.
11. Martin KS, Scheet NJ. *Visiting Clinician Association of Omaha. The Omaha System: Applications for community health nursing*. Philadelphia: Saunders; 1992.
12. The Omaha System: Solving the clinical data-information puzzle. [Internet]; 2011. Available from: omaha-system.org.
13. McCloskey JC, Bulechek GM. *Nursing Interventions Classification (NIC)*. 4th Ed. St. Louis: Mosby; 2007.
14. International Classification for Nursing Practice (ICNP). [Internet]; 2011. Available from: <http://www.icn.ch/pillarsprograms/international-classification-for-nursing-practicer/>
15. Saba V. *Clinical Care Classification (CCC) System Manual: A guide to nursing documentation*. New York: Springer; 2006.
16. Monsen KA, Fitzsimmons LL, Lescenski, Lytton AB, Schwichtenberg LD, Martin KS. A public health nursing informatics data-and-practice quality project. *Comput Inform Nurs* 2006; 24(3): 152–158.
17. Asthma Care Plan [Internet]; 2009. Available from: http://omahasystemmn.org/Careplans/resp_cardiac_end/Washington_Asthma_Individual.pdf
18. Minnesota Omaha System users group. [Internet]; 2011. Available from: omahasystemmn.org.
19. Brokel JM. Infusing clinical decision support interventions into electronic health records. *Urologic Nursing* 2009; 29(5): 345–352, quiz 353.
20. Brokel JM, Harrison MI. Redesigning care processes using an electronic health record: A system's experience. *Joint Commission Journal on Quality & Patient Safety* 2009; 35(2): 82–92.
21. Martin KS, Monsen KA, Bowles KH. The Omaha System and meaningful use: Applications for practice, education, and research. *Comput Inform Nurs* 2011; 29(1): 52–58.
22. Monsen KA, Radosevich DM, Kerr MJ, Fulkerson JA. Public health nurses tailor interventions for families at risk. *Public Health Nurs* 2011; 28(2): 119–128.
23. International Home Care Evidence-based Standardized Care Plan [Internet]; 2010. Available from: <http://omahasystemmn.org/Careplans/PeerReviewed/International/InternationalHomeCarePathway.pdf>
24. International Home Care Evidence-based Standardized Care Plan Resources [Internet]; 2010. Available from: <http://omahasystemmn.org/Careplans/PeerReviewed/International/2011-02-07HomeCarePathwaysReferences.pdf>
25. Walker K. Why evidence-based practice now? A polemic. *Nursing Inquiry* 2003; 10(3): 145–155.