

Chapter 49. Documentation and the Nurse Care Planning Process

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Background

Tools are needed to support the continuous and efficient shared understanding of a patient's care history that simultaneously aids sound intra- and interdisciplinary communication and decisionmaking about the patient's future care. Such tools are vital to ensure that the continuity, safety, and quality of care endure across the multiple handovers made by the many clinicians involved in a patient's care. A primary purpose of documentation and recordkeeping systems is to facilitate information flow that supports the continuity, quality, and safety of care. Since recordkeeping systems serve multiple purposes (e.g., legal requirements, accreditation, accountability, financial billing, and others), a tension has arisen and is undermining the primary purpose of the record and instead fueling discontinuity of care, near-misses, and errors. Among the more specialized types of documentation is the plan of care, a requirement of the Joint Commission.^{1,2} Though planning and plans should facilitate information flow across clinician providers there is little generalizable evidence about their effectiveness.

In the first part of this chapter, evidence from studies on nursing documentation, care plans, and interdisciplinary plans of care is presented and synthesized into a framework for the Hands-on Automated Nursing Data System (HANDS) method. The method is an intervention that addresses the need for broad-based standardization of key aspects of documentation and communication to facilitate patient-centric information flow. HANDS standardizes the plan of care documentation and processes by replacing the current widely variable forms. It supports interdisciplinary decisionmaking that is based on the shared knowledge from clinicians. Finally, a case study presenting the history and future plans for the ongoing refinement of the HANDS method is presented.

Research Evidence

Recordkeeping Practices of Nurses and Nursing Documentation

Information work is a critical part of the medical endeavor. Strauss and Corbin³ note that trajectory work, as they view medical care, requires information flow before and after each task or task sequence to maintain continuity of care. Tasks are not isolated but are intertwined and build on one another to achieve patient goals. Nurses bear a large burden in both managing and implementing the interdisciplinary team's plan for the patient, as well as documenting the care and progress toward goals. As a result, nurses spend considerable amounts of time doing information work. There are several genres of nursing documentation studies: those that examine recordkeeping practices as a whole, those that examine issues relating to the documentation (time, content, completeness), and comparative evaluations of different types of changes in the documentation regime including automation versus paper. Taken together, these provide both

detailed and broad knowledge of nurses' recordkeeping practices and highlight the reasons why any change (manual or computerized) is so difficult to integrate into nursing practice.

General Recordkeeping Practices of Nurses

Nursing documentation covers a wide variety of issues, topics, and systems. Researchers, practitioners, and hospital administrators view recordkeeping as an important element leading to continuity of care, safety, quality care, and compliance.⁴⁻⁷ Studies, however, reveal surprisingly little evidence of the linkage between recordkeeping and these outcomes. The literature features multiple exhortations and case studies aimed at improving nurses' recordkeeping in general⁸⁻¹⁰ or for specific diagnoses.^{11, 12}

The literature also reveals the tensions surrounding nursing documentation. These include: the amount of time spent documenting;¹³⁻¹⁵ the number of errors in the records;^{9, 16, 17} the need for legal accountability;¹⁸⁻²⁰ the desire to make nursing work visible;²¹ and the necessity of making nursing notes understandable to the other disciplines.^{22, 23} For the purposes of this review, we confine ourselves to discussions of either manual or automated nursing systems of documenting patient care, primarily in hospitals. As we have found, while there are good and well-designed individual studies, the different methodologies, populations studied, and variables analyzed have led to little generalizability across the research, making comparisons between them impossible.

There are several literature reviews of nursing documentation systems. Urquhart and Currell²⁴ completed the most systematic and comprehensive review, examining the literature through 2004. They focus on nursing record systems as variations in the systems effect nursing practice and patient outcomes. Currell and Urquhart conclude that nurses experience tensions between patient care needs and hospital management-promoted documentation rules. They also found that the studies show both mixed responses to new systems and inconclusive links between the nursing documentation system used and its impact on patient care. Also noted was the lack of standardization among systems.²⁵

In a more targeted literature review, Langowski²⁶ examined the relationship between quality health care, particularly safety, and point-of-care online nursing documentation systems. Unlike Currell and Urquhart,²⁵ Langowski found that overall documentation quality improved with an online electronic health record (EHR). The measures used, however, varied between the studies, and documentation impact on quality was assessed through evaluating the presence of certain types of information and the frequency of data entry. The accuracy of the information was not evaluated. Nurses' satisfaction with documentation systems has also been used as a measure of quality though the relationship between satisfaction and documentation is never clearly delineated. The variation in the definition and measures used for evaluating quality is characteristic of this literature.

The final review was carried out by Karkkainen, Bondas, and Eriksson.²⁷ They conducted a metasynthesis of 14 qualitative research reports to determine how well individualized patient care was represented in nursing documentation. Karkkainen and coworkers identified three themes in the literature reflecting the tensions in the record: demands of the organization, nurses' attitudes and duties, and the patient's involvement in care. This mirrors the findings of Currell and Urquhart. In conclusion, Karkkainen, Bondas, and Eriksson argue that individualized patient care is not visible in nursing documentation, and that current methods used to standardize communication in the records (forms with check-off lists) contribute to this gap. In another work, Karkkainen and Eriksson²⁸ note that, although standardized forms of documentation can enhance concise and directed information, poorly designed forms may enhance document content but do

little to support patient-centric care. The challenge is to design systems that are patient focused but also reap the benefits of standardization in terms of more accurate, precise, and up-to-date information transfer among all members of the interdisciplinary team.

Several single studies provide additional insight into nursing recordkeeping practices. Allen²⁹ examined nurses' views of the nursing record and its routine usage in practice. Using observations and interviews, Allen found that nurses were ambivalent towards the records, both seeing them as a symbol of the place of nurses in the clinical arena, but also reporting that the records are too heavily structured by management, a finding echoed throughout the literature (e.g. Lee and colleagues³⁰). As a consequence, Allen points to the practice of nurses developing shadow documentation systems (informal nursing records and ward diaries) that help nurses maintain a high-level overview of the patient's care on one's shift.

In another qualitative study, Hardey and colleagues³¹ observed nurses in five acute elderly care wards at a district general hospital in the south of England. They argue that "scraps," individualized information systems, contained a unique combination of personal and professional knowledge and changed dynamically in response to patient care on a shift. The main source of information in the scraps was information conveyed during the nurse handover. This finding suggests that scraps provide information not found in the patient record. Instead the scraps contain the summarized or synthesized version of the patient's story that includes only the information the nurse feels is needed to carry out care effectively on one's shift.

Ngin³² picks up on the idea of information work as discussed by Strauss and Corbin³ and provides an in-depth analysis of nurses' retrieval, interpretation, documentation, and passing of information. She, too, found that nurses relied less on the formal forms of documentation in the medical record and the care plan than on informal sources; her subjects preferred getting information directly from other nurses who had first-hand, observational knowledge of patients or from summary documentation, such as in Kardexes or personal notes. Ngin quoted nurses as saying, "The Kardex is a 'living document' which nurses have dubbed the Bible of nursing care. On the other hand, nurses tend to regard care plans as 'just a requirement'"³² (p. 81). Ngin also differentiates between coordination of care (which she saw as the role of the Kardex, various worksheets, and more personalized information systems) and continuity of care (which she viewed as sustained by handovers).

In combination, these reviews and studies indicate that nursing documentation in the medical record does not meet the espoused purpose of being a communication tool that supports the continuity, quality, and safety of care. The evidence presented in this section also points to several conditions that perpetuate misunderstanding of nursing work and the means to track it. First, there is wide variation in recordkeeping practices between units and between health care organizations. Second, nurses heavily utilize shadow recordkeeping systems to aid in immediate patient care activities and decisions. Finally, there is an overwhelmingly negative attitude toward formal recordkeeping—either outright hostility or the view that documentation is "just a requirement."

Representativeness and Completeness of the Content

In several more targeted studies, the central issues of concern were how well the records reflected the care given and accuracy of the patient's condition. Tornvall and colleagues³³ audited EHR records and found that reports of medical status and interventions were more prevalent than nursing status. The authors concluded that nursing documentation was limited and inadequate for evaluating the actual care given. Ehrenberg and Ehnfors³⁴ triangulation between

data from a chart review and interviews of nurses revealed little agreement between the records and the care nurses reported as having given. The researchers went so far as to state in their findings (p. 303) that “there are serious limitations in using the patient records as a data source for care delivery or for quality assessment and evaluation of care.”³⁴

Another set of studies examined the completeness of nursing documentation; these typically utilized chart review and audit as a methodology. The issue of completeness is important; Croke³⁵ cites failure to document as one of the six top reasons that nurses face malpractice suits. In terms of overall completeness, Stokke and Kalfoss³⁶ found many gaps in nursing documentation in Norway. Care plans, goals, diagnoses, planned interventions, and projected outcomes were absent between 18 percent and 45 percent of the time. Taylor³⁷ found that many of the care plans reviewed did not convey the specific information necessary to carry out the required procedure. One third of the nurses in this study mentioned accessing written documentation but did not express any preference for care plans.³⁷

Other completeness studies have evaluated the impact of the form type and content required. In a controlled clinical trial utilizing a chart review method, Sterling³⁸ analyzed wound assessment documents from three different units. While more of the important details of wound assessment were recorded when using a wound assessment chart, missing information was found for both charting methods (conditions) in the study. In another controlled clinical trial with home care nurses, Tornkvist and colleagues³⁹ administered an educational intervention focusing on pain management. Their findings indicated that several statistically significant improvements in care were achieved after the introduction of the pain-advisers in the study units. Most pertinent to this chapter, the nurses’ satisfaction with their written documentation on pain increased with the addition of several new types of assessments used for charting pain.³⁹

While computerization has been referred to as a cure for incomplete records, the evidence on this is also mixed. Larrabee and colleagues⁴⁰ found that completeness increases over time after system implementation, with expected gains not being realized until 1 year after implementation. Care planning systems are also not immune from problems with the completeness of documentation. While Bjorvell and colleagues⁴¹ reported increased completeness of documentation, particularly in the proportion of discharge planning notes, Griffiths and Hutchings⁴² audit of records from home health care nurses found initial nursing assessments poorly documented, affecting later care.

The studies in this section indicate two things. Completeness of a record may have an impact on the quality of care, but only if it reflects completeness of the right content. Echoed again here is that document focus, rather than the patient-centric nature of the medical record, does little to support shared understanding by clinicians of care and the communication needed to ensure the continuity, quality, and safety of care. The typical content and format of documentation—and its lack of accessibility—have also resulted in document-centric rather than patient-centric records.

Time Spent Documenting

Time spent documenting patient care is generally not regarded by nurses as being patient care, even though there is a Nursing Intervention Classification (NIC) term for it. Studies focused on time indicate that nurses spend a significant amount of time recordkeeping. In the most comprehensive literature review on time, Poissant and colleagues¹⁴ reviewed 11 studies examining documentation time before and after moving from a manual to an online system. Of these studies, six reported a time savings when using a computer. There was up to a 25 percent savings by nurses charting with bedside systems. Three studies reported increased time,

particularly in the one study that employed handheld computers. However, of the three studies that assessed nurses' efficiency by using the patient as the sampling unit, the results were negative—more time was spent on documentation per patient after system implementation, with increases ranging from 7.7 percent to 128 percent. The authors propose that time efficiencies are gained by standardized forms in systems, although some systems require more information to be documented.¹⁴

Other studies have exposed the overall documentation burden carried by nurses. Hardey and colleagues³¹ found that recordkeeping was given lower status and priority than was direct patient care. It was also viewed as excessively time consuming. Nurses regularly copied data from the medical record and other documents to create personal records that guided their activities. Korst and colleagues¹³ conducted a work-sampling study over a 14-day period. Out of 2,160 observations, the average percent of time nurses spent on documentation was 15.8 percent; 10.6 percent for entry on paper records and 5.2 percent on the computer. The percentage of time spent on documentation was independently associated with day versus night shifts (19.2 percent vs. 12.4 percent, respectively). Time of day is also a factor in retrieving information.

The series of studies in this section indirectly expose the cost implications of maintaining medical records that offer little assistance to clinicians in the provision of patient-centric care. Moreover, maintaining medical records that bring little clinical value not only wastes nurses' time but also limits the time available to engage in value-added care activities. The cost implications alone justify a call-to-action to redesign documentation systems so that they are patient-centric and aligned with intended purposes.

Studies That Focus on Improving Documentation

Deficiencies in the nursing record, such as problems with accurately representing the patient, the time-consuming nature of recording, and the completeness of the record, have led to a series of interventions aimed at improving nursing documentation. The impetus for changing nursing documentation has come from several sources: hospital management, the nurses themselves, and nursing researchers. Compliance with legal mandates, paperwork reduction campaigns, and meeting professional standards are also common reasons for changing recordkeeping regimes.

The changes made to the documentation process to reach these goals vary broadly. Much of this literature is characterized by contradictory case studies. Scharf⁴³ reported a case study of one hospital that simplified a set of complex forms to enable nurses to spend more time caring for patients while still meeting the Joint Commission's documentation requirements. Another case study⁴⁴ involved a change from a preprinted form to a free-text, handwritten care plan for each patient. The studies reviewed include examples of those focused on understanding users' needs (through assessing attitudes and opinions) and those focused on implementing and evaluating interventions designed to improve documentation.

Dillon and colleagues⁴⁵ conducted a survey to assess nurses' readiness to adopt a new EHR. Their findings indicated that nurses had a positive overall attitude, although nurse age was a significant factor in determining nurses' attitudes regarding the EHR. Nurses were concerned, though, about the impact of the new EHR on quality health care delivery. In closing Dillon and coworkers noted that "these results clearly show that the nurses have real concerns about the new impending computer system and that the new system may be risky and might remove the human component of what they do"⁴⁵ (p. 144). For example, a comment made by one nurse reflected the concerns of many, "I just don't want the system problems to interfere with patient care." One of

her colleagues also commented, “I’m nervous about it [the impending system implementation]—hoping that it will not slow down my productivity—or be too time-consuming”⁴⁵ (p.144).

Other studies have used educational interventions designed to improve documentation alone or documentation and care. Karkkainen and Eriksson⁴⁶ completed a pre- and postintervention study, which involved an educational intervention to have nurses apply a theory of caring science to the care plans, to promote a more patient-focused documentation. Chart audit was done pre- and postintervention, and questionnaires assessed nurses’ attitudes about this theory-based recording method. The major change observed was more attention by nurses to patient views and increased recording of these in the plan.⁴⁶

Studies of computerized charting and care planning systems usually provide some measure for nurses’ satisfaction. Two surveys of nurses’ attitudes toward computerization are important to note. Axford and Carter’s⁴⁷ study on how nurses believed computer technology impacted their practice is important in this regard. Their survey asked about resource consumption, nursing work practices, and professional and patient outcomes. Their findings indicated that nurses did not think technology would have a negative impact on practice. This was true for both those knowledgeable about computers and those less familiar with them— although the strength of this belief did vary, with experts feeling more strongly.

Other researchers have examined the effects of computers on nursing documentation directly. Nahm and Poston⁴⁸ did a quasi-experimental, modified time series study that measured the effects of the nursing module of a point-of-care clinical information system on nursing documentation and patient satisfaction. Data were collected before implementation, and after implementation at 6-, 12-, and 18-month intervals. Compliance with items applicable to nursing documentation in the JCAHO Closed Medical Review Tool was used to assess the quality of nursing documentation. Nahm and Poston found a statistically significant increase in the quality of nursing documentation after system implementation and a reduction in the variability of charting. Most importantly, charting compliance increased and continued at the 12- and 18-month time points after initiation of the new system. This indicates that change is incremental, and that longitudinal studies are critical to assess the impact of computer systems.

The body of the literature reviewed in this section provides evidence indicating that well-constructed interventions, such as education and revising formats (automation and forms), can enhance documentation and improve patient care. The evidence also suggests that there is a time-related pattern to user satisfaction, perceptions of value, and achievement of desired documentation outcomes following the implementation of new computer information systems. Nonetheless, the findings must be interpreted with caution due to wide variation of the settings examined, interventions applied, and methods of evaluation. As with all of the literature in this area, the main limitation is lack of generalizability, due primarily to the wide variation of documentation practices within and across organizations.

Nurse Care Planning and Plans

In health care organizations, the EHR, oral reports, handoffs, conferences, and health information technologies (HIT) are intended to facilitate information flow. In particular, the JCAHO specifically conceptualizes the care planning process as the structuring framework for coordinating communication that will result in safe and effective care.² The *Essentials of Baccalaureate Education for Professional Nursing Practice*,⁴⁹ drafted by the accrediting body the American Association of Colleges of Nursing, lists several core competencies that directly relate to the nurse’s care planning process including the ability to “...diagnose, plan, deliver, and

evaluate quality care” (p. 11), “use appropriate technologies in the process of assessing and monitoring patients” (p. 14), “apply health care technologies to maximize optimal outcomes for patients” (p. 16), and “develop a comprehensive plan of care...” (p.16). Although there appears to be clear value to effective care planning and the process of communicating the plan, evidence of this in the literature lacks specificity.

The patient care planning literature encompasses a wide variety of concepts, studies, and interventions. The main subdivisions of patient care planning in the literature are advance care planning (care at the end of life), case management (working with the entire medical team and associated professionals), and critical pathways or protocols for treating specific diseases. As defined, these categories are all potential conceptual matches and should encompass nurse-related care planning and plans. The majority of the care planning literature, however, is disease-oriented or medically focused, with little attention to the actual judgments and actions nurses take in carrying out the interdisciplinary plan at the point of care. Nor does this literature evaluate the impact of nursing care on patient outcomes. We believe the following illustrates the content of literature related to nurse care planning and plans.

Several studies have been done focusing on the introduction of the Scandinavian VIPS (well being, integrity, prevention, safety) model into care planning. Ehrenberg and Enfors³⁴ performed a stratified, randomized controlled trial using chart audit and interviews. They reported that their study group that received a new form and educational intervention exhibited increased completeness and correctness of documented information, although there were still some areas in which the control group documented better than the study group.

Care plan findings from Mason’s⁵⁰ qualitative study indicated that care plans were not thought to adequately represent the patient, and consequently were not used in the planning or evaluation of care. Observations conducted as part of this study confirmed that the major guides to practice were report, direct observation of the patient, and bedside charts. In these clinical units, the care plan was viewed as actually discouraging thinking, because the standardized formats hindered individualized care by operating as check-off lists that discouraged nurses from engaging in mindful care planning. In one unit, however, the care plans were successfully integrated with practice.⁵⁰ Nurses’ attitudes toward care plans in this unit were generally positive and the plans were used to aid in explanation and communication, and to guide practice. In this unit, care plans were kept at the bedside. The success of nurses’ adoption of the care plans was attributed to the fact that they were perceived as clinically driven, more representative of the patient’s condition, and there was a sense of local ownership.

Smith and colleagues⁵¹ studied the implementation of a computerized care planning and documentation system, using the NIC and nursing outcomes classification (NOC) framework. Data were collected through questionnaires, observations, and chart audits both before and after computer implementation. Post implementation data revealed that the nurses’ attitudes toward computers were more negative and charting time was unchanged; however, chart audits revealed improvement in the completeness of the nursing record.

In research where the intervention has focused on changing the care planning process, findings have shown that patient outcomes can be improved. Implementation of a care pathway for post surgical patients, to streamline nursing care of postoperative colon resection patients, resulted in a statistically significant shorter length of stay.⁵² In another controlled study, From and colleagues⁵³ found that new care planning forms, as opposed to a narrative written in the medical record, could be associated with earlier recognition of patient problems, a shorter length of stay, and a higher accuracy in planning the discharge time.

Other studies have reported finding previously noted problems in the care planning practices. Research on the effects of the NANDA International, Nursing Interventions Classification (NIC), and Nursing Outcomes Classification (NOC) terminologies in the care planning process has also shown mixed results. Scherb⁵³ found that nursing care did make a difference in patient outcomes. However, because the method of data capture, it was impossible to identify the nursing diagnoses and interventions that contributed to the positive patient outcomes.⁵⁴

In a related study, Lillibridge⁵⁵ found that when nurses were asked to list the type of data they would normally collect using specific examination techniques, 23 percent provided nursing assessment details. It can be argued that if nurses were provided with an explicit nursing framework (and language) to document and communicate about their care that nurses and the interdisciplinary team members would more readily understand the importance and impact of nursing care and patient outcomes. Others have also found that the care plans typically do not reflect actual nursing practice.^{56, 57}

Even when care planning interventions are similar, as in the case of the introduction of the Scandinavian VIPS method for nursing documentation, results vary among studies. Studies by Darmer and colleagues⁵⁸ show both more methodological rigor and more positive results. This controlled, longitudinal study introduced the VIPS care planning model to nurses on eight units (four study and control units, respectively). The intervention consisted of different educational interventions prior to utilizing the VIPS care planning model. Data included surveys of nurses' attitudes towards documentation and their knowledge of the new regime. Nurses in the study group had more confidence in their ability to create good care plans and did better than the control group on the knowledge tests. Overall, the nurses in the study by Darmer and coworkers were more positively predisposed towards documentation than those in another VIPS study, by Björvell and colleagues.⁴¹

The Björvell and colleagues⁴¹ study also featured a VIPS intervention and results overall were positive. There was a statistically significant score increase in quantity (P values for the quantity variables ranged from $P < 0.0001 - 0.0003$) as well as quality of the nursing documentation (P values of the quality variables ranged from $P < 0.0001 - 0.0002$). In a followup study, Darmer and colleagues⁵⁹ reviewed 600 charts utilizing the VIPS model at four sites using a standardized audit tool. They found that nursing documentation significantly improved during the course of the study ($P = .00001$). After the second year, the participants used the keywords appropriately and correctly according to the VIPS model. Overall, this structured implementation program significantly improved nursing documentation.

Implementing a new care planning system without sufficient cultural, educational, and organizational support has been identified as leading to problems. Educational interventions, in particular, are a major focus in the literature. Hansebo and colleagues⁶⁰ found that although care planning documentation increased after an educational intervention, the level of assessment was low. The authors concluded that educational interventions were needed to improve clinical judgment.

Lee⁶¹ also identified major educational issues associated with the implementation of computerized documentation systems. He argues that launching a care planning system alone, without knowledge of the diagnoses or how to use the care plans in clinical decisionmaking, limits their utility. For Lee and colleagues,³⁰ the new system also increased nursing workload, primarily due to a lack of computers, and competition for terminals with other professionals and students. In the end, the nurses found the care plan lacking in three aspects: (1) content, primarily the inability to individualize patient care; (2) poor system function; and (3) lack of system

integration with the other information technology systems. In another article, Lee and Chang⁶² report on an interview-based evaluation of this system. In this latter study, the nurses interviewed saw the new system as paperwork and not patient-oriented.

The quality of and implementation strategy for care planning systems has impeded adoption as much as the actual care plan within the system. Ammenwerth and colleagues⁶³ found that planning and documentation of tasks ($P = .004$) and report writing ($P = .019$) required significantly more time with the computer based system than with the paper based system. For the care planning module, no statistically significant difference between the study and control groups was seen due to the limited number of items. At the conclusion of Ammenwerth and colleagues' study, seven nurses (58 percent) agreed that the PIK software application saved time for care planning, but only three agreed that PIK saved time for documentation of tasks or for report writing. The majority of nurses agreed that with PIK, nursing documentation is more complete (10 nurses), legibility is better (9 nurses), and that the quality of documentation is better (8 nurses).⁶³ However, Ammenwerth and colleagues did not tie these findings to patient outcomes or changes in nursing practice. The conclusion that the introduction of a care planning system alone, without supporting organizational change, will not work is also supported by Spranzo's⁶⁴ work.

In summary, the nurse care planning literature indicates several things. First, when thought goes into the care planning process, better patient outcomes are possible. Second, altering the care planning process has thus far been done in an ad hoc manner and most of the evidence is from case studies. Individualized approaches have been implemented in specific settings. Their replicability across patient care settings, even from acute care to stepdown units within one hospital, has not been tested. While supporting the continuity of care on an individual unit is good, the larger issue of increasing continuity of care across time and space (across units and health care settings) needs to be addressed if patients are to receive truly holistic care. Third, current approaches to care planning have focused primarily on the care planning document itself. While some studies^{52, 53} have changed the care planning process, the focus has been the actual plan. Finally, when the care planning process has been computerized, there appear to be substantial system problems resulting from a lack of nursing input into the module's design and functionality.³⁰ Lack of nursing input has contributed to the failure of the nurses in these studies to embrace care planning and, at times, even to be able to judge whether a different care planning approach would result in better patient outcomes.

Towards an Interdisciplinary Plan of Care

Given the problems in developing a care planning system that works well for just nurses, it is clear why creating comprehensive systems that support interdisciplinary plans is that much more complicated. This is particularly true if Gage's⁶⁵ conception of interdisciplinary teams is utilized. He defines multidisciplinary teams as those in which consultation is a series of individual consultations, where interpretation is made independently by members of the medical team. On the other hand, interdisciplinary care planning occurs when the team collaboratively synthesizes the information and reaches consensus around treatment and goals for the patient. Much of the literature falls short of Gage's ideal and what is categorized as interdisciplinary care planning should more appropriately be viewed as case management.

The majority of articles on interdisciplinary care planning focus either on case management or clinical pathways. These emanate from specialties and areas that traditionally have had closer ties among a variety of professionals (doctors, nurses, social workers) to manage a patient's

condition. Typical among the case management genre are case studies of interdisciplinary care planning in nursing homes⁶⁶ or for the elderly.⁶⁷ The clinical pathways articles focus on a specialty or specific unit, such as acute care.⁶⁸ In one qualitative study of an interdisciplinary discharge planning process, Atwal⁶⁹ found that many parts of the discharge process were regularly ignored and assessments were not done collaboratively. Nurses mentioned lack of time as the biggest barrier to interdisciplinary collaboration. Interdisciplinary care planning and the resulting plan can bring value to patients and enrich all disciplines; however, in its current iteration the vision proposed by Gage has not yet become a reality.

Practice Implications

Though the literature in this area lacks generalizability, there are a number of important implications that can be drawn. First, the enormous variability in the documentation and care planning practices exposed in this literature is a serious problem in and of itself. Given patients typically receive care from a variety of points across the health care system, moving from place to place where record content and format is variable, renders current medical records virtually useless in supporting patient-centric care in day-to-day practice. Moreover, information about a patient, once recorded, is either not accessible or—if available—is often in an unstandardized format (e.g., clinicians' own words), resulting in countless errors of omission, misinterpretation, and redundancies in care. So too, most care planning methods are considered to bring little value and suffer from the same problems of poor design, poor accessibility, and no standardization. The lack of utility of the medical record in day-to-day practice begs the moral issue of whether the cost of maintaining the record in its current form (approximately 15 percent of a nurse's time) is justified. The dollars spent on maintaining the "broken medical record" would bring more value if shifted to fund developing and refining industrywide solutions to repair the broken record. Further, the literature suggests that to compensate for poor record keeping systems, clinicians develop individualized shadow methods (scraps, also not standardized) to assist with organizing what each believes to be key information needed to carry out patient care. Since these information practices are nurse-centric and therefore variable, shadow methods further impede the flow and easy accessibility of patient information that promotes care continuity, quality, and safety.

Finally, there are valid instances of successful education interventions that improve aspects of documentation and care. The examples, however, are all locally focused and consequently also do little to fix the broken medical record. We see the broken record as a serious and costly problem to the health care industry and one that deserves a patient-centric industrywide solution. There were no studies of industrywide solutions noted in the literature. Until there is a true commitment to developing and refining industry-wide solutions that ensure accurate and comprehensive documentation, facilitating patient-centric care, the improvements that are possible in the areas of safety, cost, quality, and continuity will not be fully realized.

Research Implications

The research imperative for further study of this problem is manifested by the current state of the medical record and the high cost being incurred to maintain it. One approach to improve medical records is a patient-centric approach, which redesigns the recordkeeping system, and

that will automatically ensure that the continuity, quality, and safety of care are a primary focus. From this review, there are several key questions that need methodologically rigorous research:

1. How does variability in documentation impact patient outcomes?
2. What are the key components of an effective documentation process that is patient centered and improves the transfer of information among clinicians and across settings of care?
3. What aspects of documentation are shared among an interdisciplinary team, and what contributions to the patient record can each team member effectively provide?
4. Should documentation vary across settings of care?

Conclusion

The evidence reviewed in this chapter suggests that formal recordkeeping practices (documentation into the medical record) are failing to fulfill their primary purpose, of supporting information flow that ensures the continuity, quality and safety of care. Moreover, disproportionate attention to secondary purposes (e.g., accreditation and legal standards) has produced a medical record that is document centered rather than patient focused. Cumbersome and variable formats, useless content, poor accessibility, and shadow records are all evidence of the extraordinary failure of the medical record. Given the exorbitant cost of the record and urgent need for tools that facilitate the flow of patient-centric information within and across systems, it is imperative to develop broad-based solutions.

Case Study: The HANDS Initiative and Plan-of-Care Method

The HANDS method is an intervention currently being refined to bring a strong patient focus to the medical record by replacing current forms of care plans with a single, standardized plan and related plan of care processes. The method addresses the needs, uncovered in this chapter, for summary patient care information that is standardized, meaningful, accurate, and readily available to all clinicians involved in a patient's care across time and space. The HANDS method embodies the concepts and characteristics of high reliability organizations and as such is fixated on ensuring the continuity, quality, and safety of patient care (See Figure 1: HANDS Method Framework).

As depicted in the framework, the central thrust of the HANDS plan-of-care method is to facilitate clinician behaviors (mindfulness) and communication (heedful interrelating) that form the basis of a collective mind among the clinicians (interdisciplinary team) involved in a patient's care. Organizations and systems factors must be aligned to support the mindfulness, heedful interrelating, and collective mind. The precursors to implementation of HANDS include culture readiness and a commitment to adopt and sustain the HANDS method (i.e., a commitment to change). Culture readiness is defined as an organization or system with an infrastructure that supports change and continuous learning, and is characterized by high levels of trust among its members and expectations that clinicians will engage in activities promoting mindfulness, heedful interrelating, and collective mind. Organization or system commitment to change is manifested by an organization or system formally adopting the HANDS standardized method for systemwide use, and by providing the necessary resources to educate, implement, and sustain the method across time. Finally, as is noted in the model, the patient care outcomes to be

achieved by using HANDS and enabling mindfulness, heedful interrelating, and collective mind are safety, continuity, quality, and evidence based.

Earlier in this chapter, evidence from studies on nursing documentation and care plans as well as on interdisciplinary plans of care is presented and synthesized into a framework for the HANDS method. The method is an intervention that addresses the need for broadly based standardization of key aspects of documentation and communication, to facilitate patient-centric information flow. HANDS standardizes the plan-of-care documentation and processes, replacing the current widely variable forms, to support interdisciplinary decisionmaking that is based on shared knowledge among the clinicians. In this section, the history and future plans for the ongoing refinement of the HANDS method are presented.

This second part of the chapter focuses on the history of the HANDS Initiative and ongoing testing and refinement of the standardized plan-of-care method to date and future directions. The initiative addresses the gap previously identified in indicating the need for clinically relevant and patient-centric documentation and communication tools that support the collective mind (shared understanding) of the many clinicians involved in a patient's care across time and space. The project formally began in 1998⁷⁰ with the main purpose of bringing visibility, utility, consistency, and accessibility to the nursing portion of the interdisciplinary plan. As was previously noted, nursing care plans generally have brought little value in day to day practice due to the wide range of formats, lack of individualization and accessibility, and the infeasibility of keeping them current. During the initiative's early years the primary focus was on "perfecting" the format of the plan-of-care document through enabling technology and standardization. Through iterative refinement under real world conditions, we have learned that care plans, regardless of the quality of the document, bring little value unless they are an integral part of clinician-to-clinician (intra- and interdisciplinary) communication, serving as the basis upon which a collective mind among clinicians about a patient's care is formed. Our ultimate vision is to standardize the documentation and communication of a useful and dynamic interdisciplinary plan of care that is patient-centric, available, and used everywhere. In the following section, pertinent background information is presented, followed by a summary of the HANDS project accomplishments to date, future plans, and conclusions.

History of HANDS

The project began when our team of researchers attempted to use existing vendor software products to collect a nursing dataset coded with standardized terminologies, for a study of the Nursing Outcomes Classification in the mid-1990s.^{71,72} The terminologies had been developed for the main purposes of representing nursing in health care databases and generating comparable nursing data for evaluating nursing practice. At the time, however, it became very apparent that, because of the wide variation in the practices used by vendors to integrate the terminologies into their systems, data was not comparable and frequently not retrievable. The HANDS initiative was thus born to remedy this situation and a prototype automated plan-of-care system with a database architecture that supported the generation of comparable nursing data was developed. It was clear to us, then and now, that the use of standardized terminologies alone is insufficient to produce comparable data. Instead, comparable data is generated when the same types of information are gathered at the same time intervals, using the same standardized response sets (standardized terminologies), same database architecture, and the same rules of data entry.

Standardized Nursing Terminologies

Since the late 1970s, efforts have been underway to identify nursing content and develop a means of representing it in computerized national health databases and clinical documentation systems. Werley and Zorn⁷³ first described a minimum set of elements needed in Nursing Minimum Data Sets, and they noted that content (terminologies) would need to be developed to represent the nursing-specific items of diagnosis, intervention, and outcome. It was projected that collection of the elements represented by standardized terminologies would provide comparable data that allowed multiple uses (e.g., describe, evaluate, trend, and benchmark nursing practice).⁷³ Subsequently, a number of terminologies have been developed to serve as response sets for nursing diagnosis, outcomes, and interventions. It is currently the purview of the American Nurses Association (ANA) Committee on Nursing Practice Information Infrastructure to set recognition criteria and formally recognize those terminologies meeting the established criteria. Over the years, the recognition criteria have been expanded and revised to align with the improvements in methods and tools for generating computable concept representations.⁷⁴ Unfortunately the Committee's actions have inadvertently confused the nursing constituency and thwarted progress toward achieving the vision of collecting comparable nursing data.

Since the early 1990s, the Committee on Nursing Practice Information Infrastructure has recognized more than one terminology (response set) for each of the data elements (diagnosis, intervention, and outcome), thus causing potential adopters to ask the question, "How are we going to get standardized data if nurses use different standardized languages?" The more recent recognition of entities (e.g., Systematized Nomenclature of Medicine Clinical Terms [SNOMED CT], and ABC Codes) that encompass content from the originally recognized nursing terminologies (NANDA, NOC, NIC, Omaha System, Perioperative Nursing Data Set, Clinical Care Classification, International Classification on Nursing Practice) has begged the question of how we are to use these recognized entities to achieve our professional goal of generating comparable nursing data. In truth, it is not clear how the 12 ANA recognized terminology entities can be used to generate comparable nursing data.⁷⁵

The Terminology Solution in HANDS

From the beginning the HANDS project team grappled with how to create a long-term strategy that would generate professionwide, comparable nursing data when there was no professionwide commitment to a single terminology system. Given the circumstances of the time, we realized that professional consensus around a single terminology system was unlikely to occur in the absence of real time testing that demonstrated the value. We thus selected the terminology system with the broadest applicability—and that possessed characteristics indicative of its potential to grow and evolve over the long term—to be included in the HANDS method. The terminology system includes what is now called NANDA Classification,⁷⁶ NIC,⁷⁷ and NOC⁷⁸ to represent the diagnosis, intervention, and outcome data elements respectively gathered in HANDS. All three of the terminologies have infrastructures in place to maintain and evolve the terminologies across time. The NANDA, NOC, and NIC (N3) terminologies provide comprehensiveness of terms, in that each includes terms to describe care in all types of settings. Additionally, all have been developed through research involving literature review and the extensive input of large numbers of nurses.

The rate of diffusion of a new language can be accelerated by defining a clear direction and taking action. For example, usage of N3 in the 43 nursing programs in Michigan substantially

increased from 1997 to 2001 following a resolution by Michigan Nurses Association to support N3 use in the State. NANDA usage remained high in 2001, with 92 percent of the schools of nursing (community college and university programs) indicating use. NIC usage rose from 22 percent to 58 percent and NOC usage rose from 0 percent to 58 percent between 1997 and 2001.⁷⁹

Finally, there are several other points of evidence worth mentioning that indicate the long-term viability of the N3 terminologies within the nursing community at large. First, the N3 terminologies form a subset of SNOMED CT, the comprehensive clinical terminology. The SNOMED CT terminology is recognized by the National Centers for Vital and Health Statistics and the Consolidated Health Informatics Initiative as an acceptable standard for the Federal Patient Medical Record Information effort⁸⁰ and is an ANA recognized terminology.⁷⁵ Though nursing-specific terminology content is available in SNOMED CT, it is not the purview of SNOMED CT to keep the content current. Rather, the responsibility falls to nursing entities (terminology developers) to ensure that the quality and comprehensiveness of the terminologies is sustained and improved across time.

The N3 terminology developers are already taking responsibility for ensuring that the content is updated regularly, and that the terminology structures evolve in alignment with accepted standards for computable concept representations. As was previously noted, all three have strong internal structures for maintenance and updating of these terminologies, which have been in place for over a decade. The ongoing maintenance and support for NIC and NOC are provided through the University of Iowa-based Center for Nursing Classification and Clinical Effectiveness. To date, NIC has been translated into eight foreign languages and NOC into seven, indicating a growing international acceptance of these terminologies.⁸¹ The ongoing maintenance and development of NANDA are provided by the NANDA International office at info@nanda.org. Every 2 years a joint N3 international conference is held at a central location in the United States to promote crosspollination of ideas that support continuous diffusion of these terminologies both nationally and internationally.

Another indicator of the long term viability of N3 is its growing and extensive presence in the literature. The technique for measuring such presence, bibliometrics, has been used in health care to evaluate the extent and rate of diffusion of an innovation.⁸² For purposes of this chapter, a systematic search was conducted (with the help of CINAHL[®] personnel) to identify numbers of journal articles, complete books, and proceedings in which some aspect of the ANA-recognized, “nursing developed” terminologies (nursing content only) were a “major focus” between 1996 and 2006. The results appear in Table 3, and are organized by the nursing terminology system defined as providing terms for the data elements of nursing diagnosis, intervention, and outcome. Using this definition, there are five currently recognized ANA nursing terminology systems in addition to N3: the International Classification on Nursing Practice, the Omaha System, the Perioperative Nursing Data Set, the Clinical Care Classification, and (formerly) the Home Health Care Classification. Though the results must be interpreted with caution, it is readily apparent that there are major and substantial differences in the number of literature entries and trends between the N3 system and the others. Moreover, the number of entries for N3 appears to be growing rather than diminishing. Further analysis and interpretation of the findings will be presented in a forthcoming manuscript. Also of note is that the HANDS research conducted to date is providing evidence that N3 can be successfully integrated into a standardized, technology-supported care planning method, and generate comparable data to evaluate nursing practice.

The HANDS Initiative: Phase 1

Phase 1 of the HANDS project emerged in response to the absence of a path that would lead to the collection and generation of comparable nursing data. In this phase, our team focused on creating a standardized prototype of a dynamic, technology-supported plan that would generate comparable data. Our vision, then and now, is to evolve a useful care planning method that standardizes both the plan and the planning processes, is used widely, and generates standardized and comparable data for identifying and disseminating best practices. For a more specific account of the prototype development, see Keenan and colleagues⁷⁰

In creating the original HANDS prototype, the team made a deliberate choice to incorporate the N3 terminology system to represent the data elements of clinical (nursing relevant) diagnosis, interventions, and outcomes for the reason described above. The initial HANDS work thus focused on perfecting a tool that could be used to document the plan and generate comparable data. The teams' efforts focused on the plan format, database, and rules of data entry. The approach matched the assumed need for such a tool with the availability of the means, including the technology and terminologies.⁸³ It was believed that the tool would help meet the vision of the HANDS.

Version 1 of HANDS (single user application) was initially implemented and tested in one intensive care unit. A sociocultural approach, putting our users front and center, was used to gain an understanding of the impact of the HANDS technology on nurses' work practices.⁸⁴ Many qualitative and simple quantitative methods were employed and repeated across time in our evaluations, and the results were added to improve the HANDS tool and processes through iterations of the design, test, and refine cycle. Our methods included observations, surveys, focus groups, "think-alouds," analysis of individual use patterns available in transaction logs, and routine checks of term meaning reliabilities and NOC outcome ratings.

The findings⁸⁵ gathered from the multiple methods in the pilot study helped uncover a number of issues with the technology that were not always apparent to our nurse subjects and permitted us to implement remedies. Most importantly we learned that our initial approach was document-centric. And although our method improved compliance and satisfaction with the care planning documentation, it did little to promote the collective mind of the clinicians involved in care. In fact, we found that many of the individual nurses religiously and mindfully updated plans of care in isolation. Rarely did nurses use the plans to guide clinician-to-clinician transfer of information. In retrospect, this finding was understandable and echoed the evidence reviewed in this chapter, that the plans have typically brought little value in day-to-day practice. Expecting nurses to use plans in more patient-centric, rather than document-centric, ways without educating them about how this might be done is unlikely to bring about the desired change. These results were used to refine the software and revise the rules and training for Phase 2 of the HANDS research initiative.

The HANDS Initiative: Phase 2

In preparation for this phase, the HANDS tool was converted to a Web-based application. WEBHANDS allows the clinician to easily enter and update a patient's plan from any terminal on the unit. Since the plan-of-care histories are stored on a central server, clinicians involved in a patient's care also have ready access to the history of the patient's plan from previous episodes. This information provides the clinician an "at-a-glance summary" of the issues that have been

addressed through the care provided by the health care team, and progress toward outcomes across time. The improvements in the software accessibility were expected to streamline the documentation of the plan of care and make it easier to integrate the plan into handover communication (intradisciplinary heedful interrelating)

Phase 2 research built on lessons learned in Phase 1, as well as the integration of evidence on communication, handovers, and behaviors characteristic of high reliability organizations. There are two major aims of this 3-year, multisite study of the HANDS method, *HIT Support for Safe Nursing Care*, funded by the Agency for Healthcare Research and Quality.⁸⁶ The aims include demonstrating that standardization of the HANDS method can be maintained across multiple diverse sites and that the method fosters mindfulness, heedful interrelating, and collective mind as described in our framework presented earlier in the chapter. As can be seen, our emphasis moved from a document-centered to a patient-focused plan-of-care method that encompasses both the plan and the planning processes.

In the study, the HANDS method is implemented and fully evaluated on the participating units. Nurse champions are first identified and educated (40 hours: combination of in class, and independent study). The champions, in turn educate the remaining nurses employed on the unit (6 hours: 2 hours of classroom, 4 hours of independent study). A greater emphasis was placed on educating nurses to engage in heedful interrelating during handovers in this phase of our research. At this writing, we have just entered year 3 of the study and all units are fully live with the HANDS plan-of-care method. Nurses are required to enter admission or update care plans on all patients and to use the plans to structure communication at every handover.

Similar to our pilot phase, we are using multiple and repeated methods of evaluation and have already analyzed and integrated early findings into the tool and method.^{87, 88} Thus far, we have demonstrated that standardization of care plan entry, storage, and retrieval can be maintained across the eight participating diverse units with the HANDS software tool. As in the pilot unit, nurses have reported high levels of satisfaction with the tool and are nearly 100 percent compliant in entering admission and update plans on all patients at every handover. Still needing improvement is the use of the plan at handovers (heedful interrelating). From interviews with nurses from our four first-year study units, we learned that there was wide variation in how nurses used the plans in the handover, and this was thought to add little value.⁸⁸ So, too, nurses complained that the most current plan was not always readily accessible for the handover. To remedy the situation, the nurses recommended developing a consistent format for handovers and creating easy access to the most current plan via the computer. The feedback was used to improve the software and plans of care were made readily available to the nurse via the patient list screen. In addition the SHARE (S-ketch, H-ANDS, A-ims, R-ationale, and E-xchange) structure was devised to help nurses uniformly integrate the plan of care into the handover process and both were added to the training of nurses in our year-2 study units.⁸⁸

At this writing the four year-2 sites have been live with the revised HANDS method for nearly 4 months and, as with the year-1 sites, indicate satisfaction with the tool and almost 100 percent compliance with entering plans as directed. Nonetheless, even with the new enhancements, issues are surfacing that indicate that the revamped handover process is not yet fully working as expected. Further study of this issue is planned to determine how the handover communication can be improved. Intervention will then be devised and tested in an effort to improve heedful interrelating through our continuous learning model. In addition, we will complete our planned data collection, which will allow us to more thoroughly evaluate mindfulness and the impact of the HANDS method on the safety culture and error rates.

Future Plans for HANDS

Even without completing the full evaluation of the HANDS method in the current study, findings to date suggest several next steps. First and foremost, the study has provided evidence that the HANDS method is valuable and stable and should be considered for fuller adoption. This is because most of the benefits of the method can only be realized through widespread adoption and use, which motivates commitment that cannot be achieved when only one or two units in a system have adopted the method. For example, plan-of-care histories are not readily available unless all units in the system are using HANDS. Nurses also are reluctant to change comfortable (though variable) handover routines to embrace standardization before there is a full organizational commitment to the standardization. So, too, without widespread adoption and use of the method, it is difficult to identify best practices and disseminate these to the practitioners at the point of care through HANDS infrastructure. As is noted in our framework, depicted in Figure 1, the level of success of HANDS is integrally connected to the level of commitment to the change by the overall organization. For this reason we are encouraging organizations who express interest and readiness to adopt HANDS, to commit to full organization and adoption of the HANDS method.

We also see the need to formally position the HANDS method as an interdisciplinary initiative. As was noted in the previous sections' conclusions, there is a pressing need for tools that support the collective mind of the entire interdisciplinary team around a patient's care. The HANDS method already includes a number of features that can be easily adapted to accommodate the needs of the interdisciplinary team members. At this time a future study is planned to collaborate with physicians on refining the method for interdisciplinary use.

Finally, the method has been designed to work in and across all types of settings where patients seek care. To bring the intended value the method must work regardless of the Clinical Information System (CIS) adopted within the institution. We have begun planning the development of a universal connector that will allow HANDS to seamlessly connect to an organization's CIS regardless of the vendor types. In addition, other studies are underway to determine how to make HANDS available for immediate and widespread use. Of deepest concern and the direction of the team's passion and efforts is achieving our longstanding vision for health care.

Even without completing the full evaluation of the HANDS method in the current study, findings to date suggest several next steps. First and foremost, the current study has provided some evidence that the HANDS method is valuable and stable and should be considered for wide scale adoption. This is because most of the benefits of the method can only be realized through wide scale adoption and use that motivates commitment that cannot be achieved when only one or two units in a system have adopted the method. For example, plan of care histories are not readily available unless all units in the system are using HANDS. Nurses also are reluctant to change comfortable (though variable) handover routines to embrace standardization before full organization commitment to the standardization has been established. So too, without widespread adoption and use of the method it is difficult to identify best practices and disseminate these to the practitioners at the point of care through HANDS infrastructure. As is noted in our framework, depicted in Figure 1, the level of success of HANDS is integrally connected to the level of commitment to the change by the overall organization. For this reason we are encouraging organizations who express interest and readiness to adopt HANDS, to commit to full organizational adoption of the HANDS method.

It could be important to formally position the HANDS method as an interdisciplinary initiative. As was noted in the previous section, there is a pressing need for tools that support the collective mind of the entire interdisciplinary team around a patient's care. The HANDS method already includes a number of features that can be easily adapted to accommodate the needs of the interdisciplinary team members. Finally, the method has been designed to work in and across all types of settings where patients seek care. As such, to realize the intended value, the method would need to be effectively integrated in all clinical information systems across institutions.

Search Strategy

The areas covered in this literature review were nursing documentation and care planning. The literature cited in this chapter was identified in several ways. The medical and nursing literature on care planning, standardized terminologies, documentation, and quality indicators has been reviewed, selecting and retaining only those references that pertain to this work in some way regardless of the quality of the evidence. Additionally, a comprehensive search of the health care and organizational behavior literature was conducted, from 1996 to 2006 in MEDLINE[®] (using the OVID interface), CINAHL[®], Cochrane Library, PubMed[®], Dissertation Abstracts International, and Business Source Complete (EBSCO) to find high quality evidence available on nurse care planning and documentation. The main MeSH[®] subject search terms included continuity of patient care, documentation, medical errors, nursing records, patient care planning, and quality indicators—health care. A successive fractions search strategy was employed—a large selection of articles was made and then this was pared down to create a subset of the most applicable articles. To generate a large collection of potentially appropriate articles, each subject term was searched with minimal parameters from the subject heading; generally methods, standards, trends, and utilization were selected generating 9,422 matches. The additional limits of clinical, controlled, and randomized controlled trials (English) were set, producing a total of 118 matches.

Review of the 118 studies revealed that a number were not pertinent. For example, none of the 22 patient care planning articles pertained to nurse care planning. Only 3 of the 31 documentation articles were relevant. Many of those in the overall category of documentation were general and did not pertain to nursing. Also documentation often referred to research data collection or some other intervention, and not to patient care documentation. Consequently the results of the three searches (patient care planning AND nursing records, patient care planning AND documentation, and nursing records AND documentation) were reviewed to identify other pertinent studies, largely evaluative in nature. In these secondary searches, articles by anonymous authors, foreign language materials, commentaries, letters, 1-2 page articles, and those that were out of scope were eliminated. The resulting summaries of these articles appear in two evidence-based tables. Table 1 includes 17 studies representing the literature associated with recordkeeping quality, including studies evaluating completeness, accuracy, and timeframe of documentation. In Table 2, 22 articles are included describing research aimed at improving documentation and care planning practices.

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References

1. Joint Commission on the Accreditation of Healthcare Organizations. 2003 standards for home health, personal care, and supportive services. Oakbrook Terrace, IL: Joint Commission Resources; 2003.
2. Joint Commission on the Accreditation of Healthcare Organizations. 2005 hospital accreditation standards. Oakbrook Terrace, IL: Joint Commission Resources; 2005.
3. Strauss A, Corbin J. Grounded theory in practice. London: Sage Publications. 1997.
4. Huffman M. Redefine care delivery and documentation. *Nurs Manage* 2004;35(2):34-8.
5. Johnson K, Hallsey D, Meredith RL, et al. A nurse-driven system for improving patient quality outcomes. *J Nurs Care Qual* 2006;21(2):168-75.
6. Lindsay PM, Kelloway L, McConnell H. Research to practice: nursing stroke assessment guidelines link to clinical performance indicators. *AXON*, 2005;26(4):22-7.
7. Yocum R. Documenting for quality patient care. *Nursing* 2002;32(8):58-63.
8. Caldwell C, Komaromy D, Lynch F. Working together to improve record keeping. *Nurs Stand* 2000;14(47):37-41.
9. Cowden S, Johnson LC. A process for consolidation of redundant documentation forms. *Comput Inform Nurs* 2004;22(2):90-3.
10. Dimond B. Exploring common deficiencies that occur in record keeping. *Br J Nurs* 2005;14:568-70.
11. McMath E, Harvey C. Complex wounds: a partnership approach to patient documentation. *Br J Nurs* 2004;13(11):S12-6.
12. Metcalf C. Changing documentation to improve stoma care. *Prof Nurse* 2000;15(5):307-10.
13. Korst LM, Eusebio-Angeja AC, Chamorro T, et al. Nursing documentation time during implementation of an electronic medical record. *J Nurs Adm* 2003;33(1):24-30.
14. Poissant L, Pereira J, Tamblyn R, et al. The impact of electronic health records on time efficiency of physicians and nurses: a systematic review. *J Am Med Assoc* 2005;293:1505-16.
15. Sprague A, Trepanier MJ. Charting in record time. *AWHONN Lifelines* 1999;3(5):25-30.
16. Castledine G. The blunders found in nursing documentation. *Br J Nurs* 1998;7:1218.
17. Smith J, Crawford L. The link between perceived adequacy of preparation to practice, nursing error, and perceived difficulty of entry-level practice. *JONAS Healthc Law Ethics Regul* 2003;5(4):100-3.
18. Dimond B. Exploring the legal status of healthcare documentation in the UK. *Br J Nurs* 2005;14:517-8.

19. Frank-Stromborg M, Christensen A, Elmhurst D. Nurse documentation: not done or worse, done the wrong way—part I. *Oncol Nurs Forum* 2001;28:697-702.
20. Wilson AA. The quest for accountability: patient costs & outcomes. *Caring* 1996;15(6):24-8.
21. Pearson A. The role of documentation in making nursing work visible. *Int J Nurs Pract* 2003;9:271.
22. Davidson N, Egbert K, Merchant M, et al. An interdisciplinary documentation performance improvement project. *J Nurses Staff Dev* 2004;20(5):236-41.
23. Metnitz PG, Vesely H, Valentin A, et al. Evaluation of an interdisciplinary data set for national intensive care unit assessment. *Crit Care Med* 1999;27(8):1486-91.
24. Urquhart C, Currell R. Reviewing the evidence on nursing record systems. *Health Informatics J* 2005; 11(1):33-44.
25. Currell R, Urquhart C. Nursing record systems: effects on nursing practice and health care outcomes (Cochrane review). *The Cochrane Library* 2003; 3:CD002099.
26. Langowski C. The times they are a changing: effects of online nursing documentation systems. *Qual Manag Health Care* 2005;14(2):121-5.
27. Karkkainen O, Bondas T, Eriksson K. Documentation of individualized patient care: a qualitative metasynthesis. *Nurs Ethics* 2005;12(2):123-32.
28. Karkkainen O, Eriksson K. Structuring the documentation of nursing care on the basis of a theoretical process model. *Scand J Caring Sci* 2004;18:229-36.
29. Allen D. Record-keeping and routine nursing practice: the view from the wards. *J Adv Nurs* 1998;27(6):1223-30.
30. Lee TT, Lee T-Y, Lin K-C, et al. Factors affecting the use of nursing information systems in Taiwan. *J Adv Nurs* 2005;50(2):170-8.
31. Hardey M, Payne S, Coleman P. “Scraps”: Hidden nursing information and its influence on the delivery of care. *J Adv Nurs* 2000;32(1):208-14.
32. Ngin P. Organizational analyses of computer user acceptance among nurses. Ann Arbor, MI: University of Michigan; 1993.
33. Tornvall E, Wilhelmsson S, Wahren LK. Electronic nursing documentation in primary health care. *Scand J Caring Sci* 2004;18(3):310-7.
34. Ehrenberg A, Ehnfors M. The accuracy of patient records in Swedish nursing homes: congruence of record content and nurses' and patients' descriptions. *Scand J Caring Sci* 2001;15:303-10.
35. Croke EM. Nurses, negligence, and malpractice. *AJN* 2003;103(9):54-63.
36. Stokke TA, Kalfoss MH. Structure and content in Norwegian nursing care documentation. *Scand J Caring Sci* 1999;13(1):18-25.
37. Taylor C. Assessing patients' needs: does the same information guide expert and novice nurses? *Int Nurs Rev* 2002;49(1):11-9.
38. Sterling C. Methods of wound assessment documentation: a study. *Nurs Stand* 1996;11(10):38-41.
39. Tornkvist L, Gardulf A, Strender L. Effects of “pain-advisers”: district nurses' opinions regarding their own knowledge, management and documentation of patients in chronic pain. *Scand J Caring Sci* 2003;17(4):332-8.
40. Larrabee JH, Boldreghini S, Elder-Sorella K, et al. Evaluation of documentation before and after implementation of a nursing information system in an acute care hospital. *Comput Nurs* 2001;19(2):56-65.
41. Bjorvell C, Wredling R, Thorell-Ekstrand I. Long-term increase in quality of nursing documentation: effects of a comprehensive intervention. *Scand J Caring Sci* 2002; 16(1):34-42.
42. Griffiths J, Hutchings W. The wider implications of an audit of care plan documentation. *J Clin Nurs* 1999;8(1):57-65.
43. Scharf L. Revising nursing documentation to meet patient outcomes. *Nurs Manage* 1997;28(4):38-9.
44. Fawcett J. Care planning: the best tool for the job? *Nurs Crit Care* 1998;3(2):89-97.
45. Dillon TW, Blankenship R, Crews T Jr. Nursing attitudes and images of electronic patient record systems. *Comput Inform Nurs* 2005;23(3):139-45.
46. Karkkainen O, Eriksson K. Recording the content of the caring process. *J Nurs Manage*, 2005;13(3):202-8.
47. Axford RL, Carter BL. The impact of clinical information systems on nursing practice: nurses' perspectives. *Comput Nurs* 1996;14(3):156-63.

48. Nahm R, Poston I. Measurement of the effects of an integrated, point-of-care computer system on quality of nursing documentation and patient satisfaction. *Comput Nurs* 2000;18(5):220-9.
49. American Association of Colleges of Nursing. The essentials of baccalaureate education for professional nursing practice. Washington, DC: American Association of Colleges of Nursing; 1998.
50. Mason C. Guide to practice or "load of rubbish"? The influence of care plans on nursing practice in five clinical areas in Northern Ireland. *J Adv Nurs* 1999;29(2):380-7.
51. Smith K, Smith V, Krugman M, et al. Evaluating the impact of computerized clinical documentation. *Comput Inform Nurs* 2005;23(3):132-8.
52. Stephen AE, Berger DL. Shortened length of stay and hospital cost reduction with implementation of an accelerated clinical care pathway after elective colon resection. *Surgery* 2003;133:277-82.
53. From G, Pederson M, Hansen J, et al. Evaluating two different methods of documenting care plans in medical records. *Clinical Governance: An International Journal* 2003;8(2):138-50.
54. Scherb C. Outcomes research: making a difference. *Outcomes Manag* 2002;6(1):22-6.
55. Lillibridge J, Wilson M. Registered nurses' descriptions of their health assessment practices. *Int J Nurs Pract* 1999;5(1):29-37.
56. Coldwell G, Page S. Just for the record. *Nurs Manage* 1996;2(9):12-3.
57. Kerr MP. A qualitative study of shift handover practice and function from a socio-technical perspective. *J Adv Nurs* 2002;37(2):125-34.
58. Darmer MR, Ankersen L, Nielsen BG, et al. The effect of a VIPS implementation programme on nurses' knowledge and attitudes towards documentation. *Scand J Caring Sci* 2004;18:325-32.
59. Darmer MR, Ankersen L, Nielsen BG, et al. Nursing documentation audit—the effects of a VIPS implementation programme in Denmark. *J Clin Nurs* 2006;15:525-34.
60. Hansebo O, Kihlgren M, Ljunggren G. Review of nursing documentation in nursing home wards—changes after intervention for individualized care. *J Adv Nurs* 1999;29:1462-73.
61. Lee TT. Nursing diagnoses: Factors affecting their use in charting standardized care plans. *J Clin Nurs* 2005; 14:640-7.
62. Lee TT, Chang PC. Standardized care plans: Experiences of nurses in Taiwan. *J Clin Nurs* 2004; 13(1):33-40.
63. Ammenwerth E, Eichstadter R, Haux R, et al. A randomized evaluation of a computer-based nursing documentation system. *Methods Inf Med* 2001;40:61-8.
64. Spranzo LG. (1993). Effects of computerized nurse care planning on selected health care effectiveness measures. Unpublished doctoral dissertation, University of Maryland. 1993.
65. Gage M. Ten steps to a patient-driven interdisciplinary care plan. *Aspens Advis Nurse Exec* 1998;13:6-8.
66. Dellefield ME. Interdisciplinary care planning and the written care plan in nursing homes: a critical review. *Gerontologist* 2006;46:128-33.
67. Flaherty E, Hyer K, Kane R, et al. Using case studies to evaluate students' ability to develop a geriatric interdisciplinary care plan. *Gerontol Geriatr Educ* 2003;24(2):74.
68. Sabo JA, Conbere PC, Rusch A, et al. Developing an outcome-based multidisciplinary care planning tool. *J Nurs Care Qual* 2005;20(2):145-53.
69. Atwal A. Nurses' perceptions of discharge planning in acute health care: a case study of one British teaching hospital. *J Adv Nurs* 2002;39(5):450-8.
70. Keenan GM, Stocker JR, Geo-Thomas AT, et al. The HANDS project: studying and refining the automated collection of a cross-setting clinical data set. *Comput Inform Nurs* 2002;20(3):89-100.
71. Keenan G. Evaluation of nursing-sensitive patient outcome measures. University of Iowa (National Institute of Nursing Research Grant 1 R01 NR03437-01). 1998-2001.
72. Johnson M. Evaluation of nursing-sensitive patient outcome measures (National Institute of Nursing Research Grant RO1 NR03437-01). 1997-2001.
73. Werley HH, Zorn C. The nursing minimum data set: benefits and implications. In: Werley H and Lang H eds. Identification of the nursing minimum data set. New York: Springer; 1998.

74. Coenen A, McNeil B, Bakken S, et al. Toward comparable nursing data: criteria for data sets, classification systems, and nomenclature. *Comput Nurs* 2001;19(6):240-6.
75. American Nurses Association. Nursing practice information infrastructure. 2006. Available at: <http://www.nursingworld.org/npii/terminologies.htm>. Accessed October 24, 2006.
76. NANDA International. Nursing diagnoses: definition and classification 2003-2004. Philadelphia: NANDA International; 2003.
77. McCloskey Dochterman JC, Bulachek G, eds. Nursing interventions classification. 4th ed. St. Louis, MO: Mosby; 2004.
78. Moorhead S, Johnson M, Maas M, eds. Nursing outcomes classification. 3rd ed. St. Louis, MO: Mosby; 2004.
79. Keenan GM, Treder M, Clingerman E. Survey indicates sharp increase in usage of NANDA, NOC, and NIC. *Mich Nurse* 2001;74(8):19-21.
80. Systematized Nomenclature of Medicine International. SNOMED International Website. 2006. Available at: <http://www.snomed.org/snomedct/standards.html>. Accessed November 5, 2006.
81. Centers for Nursing Classification & Clinical Effectiveness. 2006. Available at: <http://www.nursing.uiowa.edu/centers/cncce/>. Accessed November 5, 2006.
82. Estabrooks C, Winther C, Dirksen L. Mapping the field: a bibliometric analysis of the research utilization literature in nursing. *Nurs Res* 2004;53(5):293-303.
83. Keenan G, Killeen M, Clingerman E. NANDA, NOC, and NIC: progress toward a nursing information infrastructure. *Nurs Educ Perspectives* 2002; 23(4):162-3.
84. Berg M, Langenberg C, Berg I, et al. Considerations for sociotechnical design: experiences with an electronic patient record in a clinical context. *Int J Med Inform* 1998; 52:243-51.
85. Keenan GM, Yakel E. Promoting safe nursing care by bringing visibility to the disciplinary aspects of interdisciplinary care. Paper presented at the American Medical Informatics Association Conference, Washington, DC. 2005.
86. Keenan G, Yakel E. HIT support for safe nursing care (7-R01 HS01 5054 02). 2004-2007. Agency for Healthcare Research and Quality.
87. Keenan GM, Yakel E, Marriott D. HANDS: A revitalized technology supported care planning method to improve nursing handoffs. Paper presented at the 9th International Congress on Nursing Informatics, Seoul, Korea, June 11-14, 2006.
88. Tschannen D, Keenan G, Yakel B, et al. (in press). HANDS: A Nursing-Oriented Standard for Documenting and Communicating the Interdisciplinary Plan of Care in the EHR to Improve Safety. *J Healthc Inf Manag*.

Table 1. References Associated with Recordkeeping Quality (Completeness, Time)

Source	Issue	Design	Sample	Methods/Measures	Selected Findings
Allen 1998 ²⁹	Examines nurses' views of the nursing record and its usage in practice	Qualitative study, United Kingdom	1 Hospital 2 Units 29 Registered nurses 8 Doctors 5 Auxiliaries 11 Clinical managers	Observations Interviews	-Written form of the nursing process comprises three main components: (1) pro forma, where biographical information is recorded; (2) a nursing care plan (patient's problems are identified and the appropriate nursing response is agreed upon); and (3) the nursing kardex (record of patient's progress). -Perceptions of care planning: (1) pressured to include 'problems' to satisfy quality assurance initiatives; (2) completed for fear of repercussion by senior staff; (3) mechanistic script to alleviate legality concerns; (4) devalued, as it is destroyed after patient's discharge; (5) rarely reviewed during patient stay.
Bjorvell 2002 ⁴¹	Evaluate effects of intervention on the quantity and quality of nursing documentation	Quasi-experimental longitudinal study	1 Hospital 3 Wards 269 Patients records	Intervention = organizational changes and education regarding nursing documentation, with the VIPS model using the Chart Audits (Cat-ch-Ing Instrument)	-Statistically significant score increase in quantity (P values for the quantity variables ranged from $P < 0.0001 - 0.0003$) as well as quality of the nursing documentation (P values of the quality variables ranged from $P < 0.0001 - 0.0002$), in the intervention wards, directly after the intervention.
Currell 2003 ²⁵	Assess the effects of registered nurses' record systems on nursing practice & patient outcomes	Cochrane systematic review	8 Clinical Trials 1,497 people	Systematic Review	-No conclusive evidence was found of effects on practice attributable to changes in record systems. -RNs experience tensions between PT needs and hospital management documentation rules
Ehrenberg 2001 ³⁴	Analyzes the concordance between nursing documentation & descriptions of practice	Case comparison study random sampling	17 Nursing homes wards 85 Patients 128 interviews	Audits of records; Interviews of patients and RN	-Problems more frequently reported than recorded in the patient records—between 11% and 59% of the patients' problems identified by the nurses were recorded. -Concordance between nurses' statements and recorded data was significantly better in the study groups on mental condition ($P < .001$), and mobility ($P < .005$)

Source	Issue	Design	Sample	Methods/Measures	Selected Findings
Griffiths 1999 ⁴²	Determine adequacy of nursing documentation in describing patient care	Retrospective, criteria based audit Random sampling	1 Trust 103 care plans	Audit of Charts	-Room for improvement in the documentation of evaluation within the nursing care plans.
Hardey 2000 ³¹	Explore the role of RN interaction and documentation on patient care	Qualitative, nonexperimental ethnographic study	1 Hospital 5 Wards 34 Registered nurses 23 Handovers	Observations Interviews	-Nurses argued repeatedly that their scraps (personal notes) were more up to date, convenient, and therefore were a better source of information than was conventional paperwork. -Care plans were not used to inform care
Karkkainen 2005 ²⁷	Synthesis of literature surrounding patient care & nursing documentation	Meta-synthesis evaluation study	14 Qualitative research reports	Literature Review and Synthesis (1996 – 2003)	-Individualized care not clearly visible in nurses' documentation; tasks described more frequently than patients' experiences of their care. -Documentation did not reflect the care being provided to the patient. The structure of nursing documentation, which is presupposed by the organization, may prevent individual recording of patient care.
Korst 2003 ¹³	Determine time spent on documentation	Work sampling study	1 Hospital 1 Unit 120 Observations	Observations (of documentation in the EHR and paper format)	-Percentage of time spent by nurses on each activity: 15.79% spent on all documentation: paper charting used 10.55% of nursing time, computer charting used 5.24% of time; 11.39% of time charting at the bedside, compared with 4.4% at other unit work areas.
Langowski 2005 ²⁶	Determine electronic documentation systems link with improved quality	Literature review	5 Studies	Literature Review	-Overall, online nursing documentation systems would be beneficial in improving documentation requirements, end-user satisfaction, and influence how nursing is practiced
Larrabee 2001 ⁴⁰	Evaluates differences in documentation after implementation of nursing information system	Time series evaluation study	1 Hospital 3 Units	Intervention = implementation of care planning feature in a NIS (Nursing Information System)	-Mean nurse assessments of patient outcomes (NASSESS) scores were statistically significant at the $p < 0.000$ among nurses during each of the three study time points. No consistent pattern for which unit had the highest/lowest score, although Unit 3 did have the lowest score at Times 1 and 2. -Six months of using a nursing information system is not sufficient time for registered nurses to acquire documentation mastery (as evident by decrease in scores from Time 1 to 2 and increase from Time 2 to 3 for many of the variables).

Source	Issue	Design	Sample	Methods/Measures	Selected Findings
Ngin 1993 ³²	Explores user acceptance of health information technology	Non-experimental, descriptive study	547 Registered nurses	Focus Groups Observations Surveys	-Health information technology required greater coordination so that information is entered and Registered nurse tasks are carried out in a timely manner. -Hospital membership, position occupied, and unit norms significant predictors of computer use. -Organizational variables were better predictors of actual computer use, and individual variables were better predictors of attitudinal user acceptance.
Poissant 2005 ¹⁴	Identify factors associated with differences in effectiveness among electronic health records	Systematic review	23 Studies	Literature Review	-Use of bedside terminal and central desktops respectively saved registered nurses 24.5% and 23.5% of time spent documenting during shift. -Desktop for computerized prescription order entry was found to be inefficient, increasing work time 98% to 328% (Medical doctor time per shift)
Sterling 1996 ³⁸	Determine change in documentation of wound assessment	Nonexperimental, comparative independent groups study	2 Hospitals 3 Wards 46 Patient charts	Chart Audits	-Relevant parameters of wound assessment were documented more frequently when a wound assessment chart was used -Many of the delaying factors suggested as important in the literature for wound care were not documented.
Stokke 1999 ³⁶	Evaluate quality and completeness of documentation	Nonexperimental, descriptive study	2 Hospitals 5 Wards 55 Patient Records	Chart Audits	-Nursing care plan was present in 62% of the records. Nursing goals were lacking in the remaining 38%, diagnosis and planned interventions were absent in 18%, and 45% of the diagnoses lacked information concerning patient progress or outcome. -The nursing care plans were updated in only 40% of the records and discharge notes were present in 35% (NBH recommendations not met).
Taylor 2002 ³⁷	Identify problem-solving studies used while providing patient care	Qualitative, nonexperimental study	1 Hospital 33 Registered nurse students/Registered nurses	Observations Interviews	-Nurses accessed four main data sources when preparing to carry out a procedure: nursing handover, patient documentation, previous knowledge of the patient, and a selection of other sources grouped as "miscellaneous." -Patient documentation (history and care plan are two most significant sets of documents): Many of the nursing care plans reviewed in this study did not convey the specific information necessary to carry out the required procedures; 1/3 mentioned accessing written documentation, but did not express a preference for source.

Source	Issue	Design	Sample	Methods/Measures	Selected Findings
Tornkvist 2003 ³⁹	Determine effects of an implementation of pain-advisers on satisfaction & documentation	Controlled clinical trial	5PHCCs 53 Registered nurses	Intervention = implementation of 'pain advisers' Survey	-Several statistically significant improvements were achieved after the introduction of 'pain-advisers' in the study units -Increased registered nurse satisfaction with documentation in study units
Tornvall 2004 ³³	Determine what documented in the health record	Nonexperimental, descriptive study; stratified random selection	27 Primary health care centers 154 District nurses 41 Nursing records	Survey Chart Audit (using Catch-Ing.)	-Keywords "nursing intervention," "nursing outcome," and "nursing status" received the highest score, whereas keywords "nursing goal" and "nursing diagnosis" received the lowest score. -Patient status found in 30% of the notes under keyword "nursing intervention." All notes contained medical details and medically based treatments. -Predominance of documentation of medical/objective status rather than nursing status.
Urquhart 2005 ²⁴	Update of Currell and Urquhart (2003) Cochrane Review assessing the effects of registered nurse record systems on nursing practice & Patients outcomes	Systematic review	26 Qualitative studies	Systematic Review	Qualitative research on nursing records systems, documentation of verbal exchanges concerning nursing care, and organization of nursing records are inconclusive concerning how well the records represent nursing practice and which systems (analog or computerized) improve patient outcomes.

Table 2. References associated with Improving Documentation and Care Planning Practices

Source	Issue	Design	Sample	Methods/Measures	Selected Findings
Ammenwerth 2001 ⁶³	Investigate influence of information technology on time and quality of documentation	Randomized control trial	1 Hospital 5 Medical doctors 12 Registered nurses 60 Patients	Intervention = implementation of a nursing information system. Documentation Analysis; Survey	-Documentation of tasks ($P = .004$) & report writing ($P = .019$) required more time with the computer-based versus the paper system; time for preparing care plans was not significantly different between groups -Survey—7 registered nurses (58%) agreed that PIK saved time for care planning; only 3 (25%) agreed that PIK saved time for documentation of tasks or for report writing; 10 registered nurses (83%) agreed nursing documentation was more complete, 9 (75%) agreed that legibility was better & 8 (66%) agreed that quality of documentation was better.
Atwal 2002 ⁶⁹	Understanding of RNs' perception of the discharge process	Case study	1 Trust 19 RNs	Interviews Observations	-Communication dependent on the relationship between members of the team. RNs noted difficulty in communicating with others on the team (i.e., time-consuming task) -RNs concerned that nurses did not question info that they did not comprehend at handover. Handover was the key area where information was miscommunicated.
Axford 1996 ⁴⁷	Determine impact of CIS on nursing practice	Non-experimental, descriptive study	33 Registered nurses (interviews) 291 Registered nurses (survey)	Interviews Surveys	-Nurses (whether computer naive or knowledgeable) do not expect the technology to have negative impact on practice. -The two groups differed mostly in the strength of their beliefs. One startling outcome, that slow computer response time delayed care, was identified within the computer-user group and direct action was taken as a result.
Bjorvell 2002 ⁴¹	Evaluate effects of intervention on the quantity and quality of nursing documentation	Quasi-experimental longitudinal study	1 Hospital 3 Wards 269 Patient records	Intervention = organizational changes and education regarding nursing documentation with the VIPS model Chart Audits (Cat-ch-Ing Instrument)	-Statistically significant score increase in quantity (P values for the quantity variables ranged from $P < 0.0001 - 0.0003$) as well as quality of the nursing documentation (P values of the quality variables ranged from $P < 0.0001 - 0.0002$), in the intervention wards, directly after the intervention.

Source	Issue	Design	Sample	Methods/Measures	Selected Findings
Darmer 2006 ⁵⁹	Evaluate the quality of nursing assessment and quantity of care plans using the VIPS model	Evaluation study	4 sites 600 Patient charts	Intervention = implementation program introducing the VIPS model Chart Audits (Cat-ch-Ing Instrument)	-Nursing documentation significantly improved during the course of the study ($P = .00001$). -The structured implementation program significantly improved nursing documentation and the simultaneous training of the entire nursing staff.
Darmer 2004 ⁵⁸	Explores registered nurses' knowledge and attitudes towards documentation	Controlled clinical trial	1 Hospital	Intervention = implementation program introducing the VIPS Model Survey & Test	-Experimental group were significantly stronger in their convictions that they had the knowledge to make care plans ($P = 0.03$) and that they routinely made them ($P = 0.01$). -Experimental group showed less motivation than the control group, although both did consistently better on the knowledge tests
Dillon 2005 ⁴⁵	Predict registered nurses intention to adopt Electronic Health Records	Nonexperimental, descriptive study	1 Hospital 140 Registered nurses	Survey	-Age was a significant factor in determining nurses' attitudes towards the electronic patient record system ($P < .05$). -Age had a direct ($P = .02$) and indirect (via Image, $P = .02$) effect on nursing attitudes towards the electronic patient record system. -Image had a direct effect ($P = .000$) on attitudes of nurses towards the electronic patient record system. -Nurses presented concern with the new electronic patient record system, thinking it may be risky and remove the human component of what nurses do.
Ehrenberg 2001 ³⁴	Analyzes the concordance between nursing documentation & descriptions of practice	Case comparison study, random sampling	17 Nursing homes wards 85 Patients 128 Interviews	Audits of records Interviews of patients and registered nurses	-Problems more frequently reported than recorded in the patient records—between 11% and 59% of patient problems identified by the nurses were recorded. -Concordance between nurses' statements and recorded data was significantly better in the study group on mental condition ($P < .001$), and mobility ($P < .005$)

Source	Issue	Design	Sample	Methods/Measures	Selected Findings
From 2003 ⁵³	Evaluates care planning in 2 different ways, and its effectiveness on improving outcome	Randomized controlled prospective	Study 1 (S1): 1 Hospital 4 Units 222 Patients Study 2 (S2): 1 Hospital 4 Units 304 Patients	S1 Intervention = Registered nurses & Medical doctors collaboratively developed care plans S2 Intervention = care plan randomly removed from record Interview Chart Audits	(S1) -Problems identified earlier with intervention $P = .01$ (1 vs. 3 days) - Solutions initiated earlier with intervention (Not statistically significant); LOS same between both groups (Not statistically significant) (S2) -Patients with planning form still on record had lower length of stay ($P = .02$) and greater accuracy of expected length of stay ($P = .02$) -Accomplishment of plan of action and readmission unchanged.
Hansebo 1999 ⁶⁰	Comparison of nursing documentation before and after a supervised intervention	Pre-/post-intervention study Sweden	3 Wards 58 Patients	Intervention = implementation of individualized and documented care using the RAI/MDS Chart Review	-Daily notes increased both in total (42% increase after intervention) and within parts of the nursing process (patient situations increased 63%, implementation by 61%, and evaluations by 100%). -52% of the Resident Assessment Protocol items not documented in care plans.
Karkkanien 2005 ⁴⁶	Extent to which theory-based documentation reveals actual patient's experience with care	Pre-/post-intervention study	6 Hospitals 7 Wards 137 Registered nurses	Intervention = educational component to apply theory of caring science to care plans Audits Surveys	-Post-intervention, more attention was noted to patient views and increase in recording of patient care plans -RNs need strong support from managers to successfully implement a theory-based documentation system
Lee 2005 ³⁰	Identify factors influencing effectiveness of information technology	Cross-sectional, non-experimental study	120 Units 738 Surveys	Surveys	-Major issues identified by users of computerized documentation systems: hardware insufficiency, content design, poor system function, policy requirement, privacy/legal violations, and other perspectives -Nurses were dissatisfied with the care plan content, inability to individualize, poor system function, and no system integration

Source	Issue	Design	Sample	Methods/Measures	Selected Findings
Lee 2005 ⁶¹	Explore factors affecting nurses' use of nursing diagnoses in charting standardized nursing care plans	Qualitative Taiwan	1 Hospital 12 Registered nurses	Interviews	-Themes described by nurses when using nursing diagnoses in standardized nursing care plans: (1) choosing familiar patient problems—fitting diagnoses to existing paper form; (2) Inapplicable related factors—turn to SOAP notes (some of the factors on the standardized forms were not applicable); (3) Unavailable subjective data—replaced with objective data; (4) Unrealistic expected goals—skip or ignore (expected goals largely ignored); (5) General intervention—selected or added to the chart as needed (listed activities comprehensive, but not realistic); (6) requirement for consistent evaluation created meaningless tasks (most labor-intensive aspect of documentation).
Lee 2004 ⁶²	Explore nurses' experiences using a standardized care plan	Qualitative Taiwan	1 Hospital 19 Registered nurses	Interviews	-Themes describing impact of standardized care plan: (1) being reminded of care procedures; (2) time saved in making care plans (with standardized format); (3) Making shift reports very timely (too much paper); (4) Undesirable content design (inflexible & hard to apply to individual patients); (5) paperwork-oriented/not patient-centered (time consuming, double charting). -Some patient problems ignored to lighten the paperwork load
Lillibridge 1999 ⁵⁵	Investigate health assessment and documentation practices	Nonexperimental, descriptive study	1 Hospital 2 Domiciles 65 Registered nurses	Survey	-Only 23% of nurses mentioned nursing assessment details when asked to list the type of data they would collect for specific examination techniques - Findings generally indicated that nurses appear to maintain a medical- versus-nursing perspective of their actions—perpetuates view that nursing practice is medically driven
Mason 1999 ⁵⁰	Investigate current care planning and effects on practice	Qualitative United Kingdom	5 Trusts 5 Units	Observations Focus groups Subject Diaries	-In the 4 comparable units, the primary issues identified with care planning included lack of time, pressure, not seen as valuable, & lack of specificity. -Observation confirmed the main guides to practice were verbal report, direct observation of the patient, and bedside charts. -In the specialty unit, the care plans were integrated well with practice, were viewed positively, guided communication & practice, and were kept at bedside.

Source	Issue	Design	Sample	Methods/Measures	Selected Findings
Nahm 2003 ⁴⁸	Determine effects of a clinical information system on documentation & patient satisfaction	Quasi-experimental study	1 Hospital 11 Units 288 Patient charts	Chart Audits Survey	-13% increase in compliance to JCAHO standards (85% vs. 98% at 18 months) ($P = .0003$) after intervention of a clinical information system -After intervention, each of the three time periods showed a statistically significant improvement in quality of documentation ($P < .01$)
Scharf 1997 ⁴³	Examine the association between time associated with documentation practices and patient outcomes	Pre- and post-controlled pilot study	2 Units 100 Patients	Intervention = revised flow sheets replaced previous documents. Included standard nursing interventions for the most commonly identified nursing diagnoses.	-A decrease of 20 minutes in charting per shift (143 minutes vs. 123 minutes) after intervention, while patient outcomes (length of stay, nosocomial infection, medication errors, and falls) remained the same on both units. -Slight improvement in patient's satisfaction and knowledge rates on the experimental units, with decreases in satisfaction and knowledge rates in the comparison unit.
Scherb 2002 ⁵⁴	Identify effects of nursing interventions noted in the EHR on patient outcomes	Longitudinal study	2 Facilities 669 Patients	Chart Review (care plan and NOC outcomes on admission and discharge)	-Nursing care did make a difference in patient outcomes, although it was not possible to identify which interventions contributed to achievement of outcomes -3 outcomes with the largest sample size for each patient population were significantly improved at discharge compared to the admission rating ($P < .008$).
Smith 2005 ⁵¹	Identify association between a computerized documentation system with satisfaction, completeness, and timeliness	Quasi-experimental, evaluation study	3 Units 46 Registered nurses 141 Patient Records	Intervention = implementation of electronic care planning system Survey Observations Audits	-Statistically significant decreases in scores from pre- to post-intervention: (1) computers make registered nurses' jobs easier ($P < .001$); (2) computers save steps and allow registered nurses to become more efficient ($P = .002$); (3) increased computer usage will allow RNs more time for patient care ($P = .002$); and (4) computer increases costs by increasing the registered nurses' workload ($P = .002$). -Completeness of documentation post-intervention: 28 (34%) documentation elements (of 8 NIC categories) were significantly more complete post computerization; 49 (60%) of the data elements remained unchanged, and five data elements (5%) were less complete post-intervention. -Time spent with the patient directly reduced from pre- to postintervention (40.4 minutes to 35.5 minutes, not statistically significant) although documentation time remained unchanged

Source	Issue	Design	Sample	Methods/Measures	Selected Findings
Spranzo 1993 ⁶⁴	Effects of computerized care planning on select outcomes	Pre-/post-intervention study with qualitative component	1 Hospital 4 Units 88 RNs 153 Patients	Intervention = implementation of a computerized care planning system Survey & Patient interviews	-Introduction of care plans had little effect on patient outcomes. -Quality of nursing care remained constant despite the difference in documented care planning.
Stephen 2003 ⁵²	Identify link between implementation of critical path and patients length of stay	Pre-/post-intervention Study	1 Hospital 138 Patients	Intervention = implementation of the critical pathway for Patients undergoing colon resections	-Mean total length of stay was less in post clinical pathway patients compared to preclinical pathway patients ($P < .001$) -Average cost per patient, with readmission costs added, was higher in the pre-pathway group compared to post-pathway group ($P = .002$).

Table 3. Number of CINAHL “Major Focus” Entries for the 5 ANA Recognized Nursing Interface Terminology Systems 1996-2006*

Terminology systems**	1996-2000	2001-2005	2006 – 10/27/06	Total
1. N3				
NANDA	115	189	45	349
NIC	38	126	23	187
NOC	26	114	25	165
Total/***duplicates	179/19	429/145	93/26	701/190
Total minus duplicates	160	284	67	511
2. ICNP	5	44	4	53
3. OMAHA	25	19	3	47
4. PNDS	5	8	1	14
5. CCC****	2	6	-	8

* Includes journal articles, books, and conference proceedings in which a terminology system or component of it was considered a “major focus.”

** Includes terms for nursing diagnoses, interventions, and outcomes. NANDA diagnosis, NIC interventions, and NOC outcomes, though recognized singularly by ANA as interface terminologies, are used in combination (N3) as a terminology system. Thus there are currently “5” nursing interface terminology systems recognized by ANA.

*** Duplicates include entries where two or more of the N3 terminologies are considered a “major focus.”

**** Formerly the Home Healthcare Classification.