

PROCEEDINGS OF THE 6th ASIS SIG/CR CLASSIFICATION RESEARCH WORKSHOP

Nursing Interventions Classification (NIC): Development and Use

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Nursing Interventions Classification (NIC): Development and Use

Much of health care is nursing care. There are about 2.2 million Registered Nurses in the United States and approximately 4.5 million nurses worldwide (AJN, 1994, Leininger, 1990). As the largest group of health care professionals, nurses work in a variety of places and have a variety of roles. Although nursing care is crucial to the welfare of health care recipients, the impact of nursing care is nearly invisible and basic questions as to the contributions of nurses remain. What is it that nurses do? Do these actions of nurses make a difference to the quality of care received? Could the increased use of particular nursing actions result in the prevention of some medical conditions, the reduction of complications, or the enhancement of health and well-being? Are some nursing actions just as effective but less costly than the actions of other health providers? With the advent of computerized health care information systems and the increased use of large data sets for the study of health care effectiveness, these questions are more timely than ever. A classification of interventions performed by nurses is essential to the systematic documentation and study of nursing care.

In 1987 a group of nurse researchers and clinicians at the University of Iowa began the development of a classification of nursing interventions which would include all treatments performed by all nurses. The result of this ongoing effort is the *Nursing Interventions Classification* (NIC), a standardized language of both nurse-initiated and physician-initiated nursing treatments. An alphabetical listing of 336 interventions was published in a book in May of 1992 (Iowa Intervention Project, 1992). Each NIC intervention is composed of a label, a definition, a set of activities that a nurse does to carry out the intervention, and a short list of background readings (see example Figure 1). NIC interventions include both the physiological (e.g. Acid-Base Management, Airway Suctioning, Pressure Ulcer Care) and the psychosocial (e.g. Anxiety Reduction, Preparatory Sensory Information, Home Maintenance Assistance). There are interventions for illness treatment (e.g. Hyperglycemia Management, Ostomy Care, Shock Management), illness prevention (e.g. Fall Prevention, Infection Protection, Immunization/Vaccination Administration), and health promotion (e.g. Exercise Promotion, Nutrition Management, Smoking Cessation Assistance). Interventions are for individuals or for families (e.g. Family Integrity Promotion, Family Support). Most recently, indirect care interventions (e.g. Emergency Cart Checking, Supply Management) and some interventions for communities (e.g. Environmental Management: Community) have been developed.

Research methods used to develop the Classification include content analysis, expert survey, focus group review, similarity analysis and hierarchical cluster analysis. The research, conducted by a large team of investigators at the University of Iowa and supported by the National Institute of Nursing Research, is ongoing. Since the 1992 publication, approximately 100 additional interventions have been developed, a taxonomic structure has been constructed and validated, all interventions have been assigned a unique code depending upon their place in the taxonomy, and a feedback and review system has been established and implemented, NIC interventions have

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been linked to nursing diagnoses, and five clinical agencies are serving as field sites to study the implementation process of NIC in nursing information systems. A second edition of the NIC book with 433 interventions will be available from Mosby Yearbook in early 1996.

The development of NIC has been accomplished in three phases. In Phase I, construction of the classification, nursing activities were identified, grouped together, and given a conceptual intervention label. In Phase II, construction of the taxonomy, the interventions were clustered together in related groups and organized at three levels of abstraction. In Phase III, clinical testing and refinement, the interventions are being included in nursing information systems and the taxonomy and interventions are being refined.

PHASE I--CONSTRUCTION OF THE CLASSIFICATION

Three steps were used to construct the classification: identification and resolution of the conceptual and methodological issues, generation of an initial list of interventions, and refinement of the intervention list and activities. Each of these is briefly overviewed below.

Step 1: Identification and resolution of the conceptual and methodological issues

During the first step of the research a number of methodological and conceptual issues were evident and eventually resolved. For example, a major methodological issue was whether we should use an inductive or deductive approach. A deductive approach, whereby interventions could be identified and placed within some existing conceptual framework, was ruled out after systematic review of existing intervention classification schemes (McCloskey & Bulechek, 1993). An inductive approach beginning with the activities that nurses in practice were using to plan and document care was decided upon. A major conceptual issue was the question of what sorts of nursing behaviors should be included in an intervention taxonomy. In order to answer the question, nurse behaviors, which capture all assessment, intervention, and evaluation activities that nurses do to benefit patients, were identified. Nurses perform, for patient benefit, the following types of behaviors:

1. Assessment behaviors to make a nursing diagnosis.
2. Assessment behaviors to gather information for a physician to make a medical diagnosis.
3. Nurse-initiated treatment behaviors in response to nursing diagnoses.
4. Physician-initiated treatment behaviors in response to medical diagnoses.
5. Behaviors to evaluate the effects of nursing and medical treatments. These are also assessment behaviors but they are done for purposes of evaluation, not diagnosis.
6. Administrative and indirect care behaviors that support interventions.

NIC captures the behaviors of nurses in categories 3, 4, and 6. The behaviors in categories 1 and 2 are assessment (pre diagnosis), not intervention (post diagnosis) functions. Category 5 focuses on evaluation and is best identified when a classification of patient outcomes is articulated. Category 6, administrative and indirect care

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behaviors, involve the supporting activities related to staff development, record keeping, staffing, scheduling, etc. They were not initially targeted for inclusion in this classification but due to feedback from nurses and because of their importance, the second edition does include many indirect care interventions. Table 1 includes the definition of a nursing intervention.

Step 2: Generation of an initial list of interventions

For several decades, nurses have written about nursing actions or activities, or those things a nurse should do as part of the implementation step of the nursing process. These writings were readily available in nursing textbooks, nursing care planning guides, and in information systems. In all of these sources, the interventions, prior to NIC, were viewed as discrete actions with little conceptualization of how these actions fit together. For example, the following were typical of "interventions" listed in current nursing textbooks: "Auscultate breath sounds before and after suctioning", "Monitor level of consciousness", and "Cut food in small pieces". Typically, textbooks include several hundred of these "interventions" with the list for any one patient, or for any one diagnosis, numbering several dozen. More often than not, these actions were a mixture of assessment and treatment activities as well as a mixture of nurse-initiated and physician-initiated activities. A list of nursing interventions for a particular condition in one book was not the same as the list in another book for the same condition. Despite the mix of actions and enormous differences in approach, it seemed to us that we could begin the task of intervention classification construction by grouping the available data. Thus, an inductive approach which made use of this rich data was a logical choice.

The investigators designed a data source rating form and used it to review and rate data sources from a variety of specialty areas. The criteria used to select the sources were: presents clear, discrete nursing actions; includes a comprehensive list of actions; and represents current practice. Forty five sources from a variety of specialty areas were reviewed. Fourteen of the highest rated sources were then used in eight content analysis exercises to create an initial list of intervention labels. The first couple of exercises used sources more general (medical-surgical) in nature; two exercises used computerized lists, and three exercises used specialty books in areas that may not have been well captured by the general or information system sources. The exact description of the exercise sources, the numbers of activities used in each exercise, and the methods used to select activities are included in the first edition of the book (Iowa Intervention Project, 1992).

Prior to the preparation of each exercise, the research team reviewed the progress and selected from the highly rated sources those that were judged most likely to produce new interventions. Once the sources for the next exercise were determined, they were reviewed by the principal investigators and the method of activity selection was determined. For nearly all sources, the activities were chosen by systematic random selection but the frequency of selection (e.g. select every fifth item, or every second item) varied by the number of activities listed in the source.

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Content analysis was used to categorize the selected nursing activities. Each of the exercises were done as follows:

1. Approximately 250 concrete nursing activities from two related sources were randomly selected and entered into a computer file.
2. Each activity was printed on a separate slip of paper and the slips distributed to all members of the research team.
3. Each team member independently categorized the activities and gave each category an intervention label.

In the beginning, each label had to be generated by the team members based upon their knowledge and experience. Beginning with the third exercise, members selected a label already identified or added a new label if an appropriate one was not on the list. Approximately 250 activities were used in each exercise because the team found that this was a manageable number of activities which also produced a good yield of labels. These exercises were very labor intensive, each requiring 4-6 hours per researcher to complete and many more hours per exercise to enter the results on the computer. As the seventh and eighth exercises produced only a few new labels and as the research team as a whole agreed that these exercises were redundant of earlier ones, it was determined that an initial list of intervention labels had been generated and that it was time to proceed to the next step of refinement. We did not believe that all the intervention labels for the taxonomy had been generated, but we thought that the vast majority had been determined and that the exercises were no longer the most helpful method to refine and expand the list.

Step 3: Refinement of the intervention list and activities

Following the content analysis exercises, each intervention label had anywhere from one to several hundred associated activities. Many of these activities were redundant because different sources proposed the same activity but with different wording. The task was to refine the labels and activities to move toward face and content validity. Two refinement methods were used: expert survey and focus group.

For the expert surveys, a two-round Delphi questionnaire process was used. National samples of certified master's prepared nurses received questionnaires composed of interventions relating to their specialty areas. The first round questionnaire was developed from the label/activity lists generated from the exercises. In addition, clinical nursing and research literature was reviewed by a team investigator who refined the activities and added any missing labels and activities. The investigator also wrote a definition of the intervention which was included in one or both survey rounds. The process, then, was that groups of related intervention labels were selected, lists of their accompanying activities generated by the computer, and, after refinement by a team investigator based on the literature, a questionnaire was constructed. Participants were asked to rate each activity according to the extent to which it is characteristic of the label. Fehring's methodology (Fehring, 1986, 1987) for content validation of nursing diagnoses was adapted for use with interventions and yielded Intervention Content Validity (ICV) scores with critical and supporting activities. Fehring's method adapted for intervention labels consisted of the following steps:

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1. Nurse experts rated the activities for each intervention on a Likert-like scale of 1 (activity is not at all characteristic of intervention) to 5 (activity is very characteristic). They were also asked to suggest any activities that were missing and to comment on the definition.

2. The Delphi technique was used to enhance consensus among experts. Two rounds of questionnaires were used. The second round presented a refinement of the first list of activities and interventions based on responses by the nurses on round one.

3. Weighted ratios were calculated for each activity. These were obtained by summing the weights assigned to each response and then dividing by the total number of responses. The weights established by Fehring were used: 5=1, 4=.75, 3=.50, 2=.25 and 1=0.

4. Activities with ratios equal to or greater than .80 were labeled critical activities. Activities with ratios less than .50 were discarded. These cutoffs, set by Fehring, are established conventions based on accepted standards for establishing reliability.

5. The total Intervention Content Validity (ICV) score was obtained for each intervention by summing the individual activity ratings and averaging the results.

Over a two year period (June 1989-June 1991), 14 surveys were completed and 138 interventions were validated. The process and results of 12 of the surveys are reported in a symposium in Nursing Clinics of North America (Bulechek & McCloskey, 1992).

The second method, focus group work, was instituted when it became apparent that the survey process was very time consuming, costly, and not appropriate for all interventions. For the focus group validation method, a team member prepared a draft of the label definition and activities for initial review by a small core group of team members followed with a review by the entire team. Sets of related interventions were often developed and reviewed together as a cluster because this helped to clarify the similarities and differences. Typically, each intervention was reviewed three times, twice by the core group and once by the entire team. For each review, anywhere from 5 to 20 people provided input. Each successive review led to further refinement of the intervention's label, definition, and activities. Sometimes the review of one intervention led to repeated review and revision of a intervention developed previously. The focus group method did not result in Intervention Content Validity scores or the grouping of categories by major and supporting activities. It did, however, result in well defined interventions with well edited and complete activity lists. The results were 198 interventions validated by focus group.

In summary, the result of Phase I work was 336 interventions, each with a label, a definition, a set of related activities that describe the behaviors of the nurse who implements the intervention, and a short list of background readings. At this point in the research, we submitted the manuscript for the first edition of NIC which was published in May of 1992. While we knew that the work was just a beginning, we believed it was necessary to publish so the project would be known and others could use the interventions and provide feed back. We did, however, continue the work and grouped the interventions into a taxonomy with numerical codes.

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PHASE II--CONSTRUCTION OF THE TAXONOMY

Two additional steps were used to generate a taxonomy.

Step 4: Arrangement of the intervention list in an initial taxonomic structure

Once the interventions had been defined an organizing structure was needed. The structure should be easy to use and clinically meaningful. Similarity ratings and hierarchical clustering techniques were used to guide the development of the taxonomy. Hierarchical cluster analysis helped us group similar interventions into clusters of related interventions and the clusters in turn were grouped into "super-clusters" on the basis of their similarities (Everitt, 1974, Sokal, 1974). The methods for the development of the taxonomy are explained in detail in an article published in Image in fall of 1993 (Iowa Intervention Project, 1993). Only a brief overview is given here and readers are referred to the article for more information.

To generate the similarity ratings, 17 nurse members of the intervention research team were given the intervention labels and definitions on separate cards. Each person sorted the interventions into related groups. They were instructed to use an inductive process and to let the categories emerge from the data (interventions and their definitions). They were also asked to put a name on each resulting group if they wanted to, but this was not necessary. They were restricted to 25 total groups as it was felt that more than this would not be useful clinically. An extra piece of paper was provided on which they were asked to write their comments about the strategies and guidelines they used for grouping.

The data from the group placements were then entered into the computer and hierarchical clustering was used to analyze the number of raters who put every two interventions in the same group. A "proximity" score for each pair of interventions, for example "Blood Products Administration" and "IV Therapy", was computed. Proximity was determined by how many raters placed these two intervention labels in the same group. Proximities for each pair were expressed as the proportion of the maximum number of points possible. If everyone put a particular pair of interventions in the same category, then that pair had a proximity of 1. Conversely, a pair of interventions, say "IV Therapy" and "Animal Assisted Therapy", that never appeared together for any rater, received a proximity of 0. There were a total of 57,970 pairs of interventions and therefore 57,970 proximities to be computed.

Complete linkage analysis was chosen as the best cluster analysis technique for this exercise and printouts of five different clusterings of the data were reviewed by the team members for clinical consistency and usefulness. The team felt that somewhere between 20 and 30 groups defined clusters that were most clinically useful and initially chose 27 clusters which appeared to group the data well. These were referred to as classes of interventions. Names were assigned to each using the suggestions made by team members during the exercise.

Each class was systematically reviewed by a select group of 4-6 team members. Distinguishing characteristics of each class were identified and a definition for each class was written. Some revisions were made and then each team member reviewed,

as a whole, the revised classes and their definitions. Additional small modifications were made and one class was eliminated. The group felt that there was consensus about the remaining 26 classes, their names and definitions, and the interventions each contained. They did not feel, however, that this was the "top" of the taxonomy. A decision was made to try the same exercise with sorting of the classes.

Thus, the 26 classes, each with their definitions and interventions, were printed on cards, and team members sorted the classes into related groups. They were again instructed to use an inductive process and let the groups emerge from the data itself. They were asked to suggest names for each group and to record comments on the decision making process they engaged in while sorting. This time they were restricted to 7 groups as it was felt that the top level of the taxonomy would be unwieldy with more.

Hierarchical cluster analysis of 26 classes resulted in six "super-clusters". The team members reviewed these and determined that they represented clinical practice and decided to call them domains. Domain labels and definitions were developed. The entire taxonomic structure consisting of domains, classes, and interventions was printed and distributed to all team members. A discussion was held and each team member was invited to submit written comments. At this point in time, we had a three tiered taxonomic structure composed of 6 domains, 26 classes, and 357 interventions (the original 336 plus others that had been developed since the publication).

Step 5: Validation of the intervention labels, defining activities, and taxonomy

Now that we had the interventions developed and organized we wanted to make sure that our work was useful to the nurse in practice. Four validation surveys were administered.

Validation survey 1--Use survey to Specialty Organizations A three-part questionnaire was distributed to heads of 32 clinical practice organizations who were members of the American Nurses' Association's National Organization Liaison Forum (NOLF). In the first part of the questionnaire, the label and definition for each of the 336 interventions were listed. The organizational representatives were asked to rate how often their members performed each intervention. The five point rating scale consisted of several times a day; about once a day; about once a week; about once a month; and rarely, if at all. In the second part of the questionnaire, respondents were asked to identify any interventions they felt were missing from the listing and to identify the interventions that are core to the specialty. Core was defined as: "if someone read the list, they would know the nature of the specialty." Part three of the questionnaire collected demographic information.

Each organizational head determined how to provide the requested information. Some had a practice committee complete the questionnaire while others designated one organization official to provide the data. Twenty-eight usable questionnaires were returned to the research team. The NOLF respondents estimated that 84% of their 264,493 total members are employed; that 43% have ten or more years experience in

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the specialty; that 41% hold a baccalaureate degree and 27% have a graduate degree; that 37% hold certification for specialty practice; and that 46% of the members use nursing diagnoses.

The survey results demonstrated that NIC does include interventions appropriate to all specialties. The responses also provide beginning data on the types of use of different interventions. Thirty six interventions were reported to be used several times a day by 50% of the specialty organizations. The six most frequently used interventions (used by 75% of the specialties several times a day) were Active Listening, Emotional Support, Infection Control, Vital Signs Monitoring, Infection Protection, and Medication Management.

Validation survey 2--Use survey to individual nurses The same questionnaire was sent to individual nurses from a variety of specialty areas who are actively engaged in clinical practice. The names were obtained from a list of respondents who had served as expert raters in prior NIC work. The respondents were asked to duplicate and pass on the questionnaire to other expert nurses. A total of 442 questionnaires were mailed and 277 usable surveys were received. The respondents were experienced, highly educated practitioners: 90% reported more than six years of experience with the median being 17 years; 77% had a baccalaureate or a higher degree, with 55% holding a master's degree. They lived in all regions of the country with the majority in the north central states. The majority were employed in hospitals with 91% working in communities with more than 30,000 people.

This survey also demonstrated that all interventions in NIC are used by nurses in clinical practice. The use ratings provided by the individual nurses were analyzed by work setting and specialty. There were 219 (79%) nurses employed in hospitals and 58 (21%) practicing in non-hospital settings. There were 111 (40%) working in intensive care and 166 (60%) practicing in other specialties. There were 159 interventions used significantly more frequently by hospital nurses than by nurses in other settings. Interventions such as Acid-Base Management, Bleeding Precautions, Electrolyte Management, and Fluid Management, which support homeostatic regulation, were very evident. Nurses who did not practice in hospitals identified 52 interventions that they used more frequently than hospital nurses. This included Abuse Protection, Anticipatory Guidance, Attachment Promotion, Reminiscence Therapy, and Therapy Group. These interventions support the family unit and facilitate life style changes. There were 185 interventions used more frequently by intensive care nurses, including the interventions that support homeostatic regulation, for example, Artificial Airway Management, Bleeding Precautions, Cardiac Care, and Code Management, as well as interventions for self care assistance, for example, Bathing, Bedrest Care, Bowel Incontinence Care, and Eye Care. There were 65 interventions used more frequently by non-intensive care nurses, including a number of interventions that support the family unit, for example, Abuse Protection, Anticipatory Guidance, Attachment Promotion, and Family Integrity Promotion: Childbearing Family, and those that facilitate life style changes, for example, Coping Enhancement, Counseling, Learning Facilitation, and Memory Training. While the survey represents only beginning data

about interventions used by nurses, it demonstrated that NIC is useful to describe the work of the practicing nurse in a variety of settings and in different specialty areas..

Validation survey 3--Use of indirect care interventions In each of the previous two surveys, respondents were asked to identify any interventions that they felt were missing from NIC. Many of the suggestions for additional interventions were in the area of indirect care: treatments performed away from the patient but important for the effectiveness of the direct care interventions. Examples include Controlled Substance Checking, Critical Path Development, Emergency Cart Checking, Environmental Management, and Supply Management. The input from the survey participants confirmed for the team members that it was important to develop more of the indirect care interventions. According to Prescott and colleagues (Prescott, Phillips, Ryan & Thompson, 1991), one half of a nurse's time is spent in indirect and unit management activities, compared with only one third of the nurse's time spent in direct care activities (estimates vary some by study). The importance of defining indirect care interventions is becoming more important as case management and the use of unlicensed assistive personnel increase. Defining both direct and indirect care interventions is necessary in order to decide what to delegate to others. The research team had several discussions about the nature of nursing interventions and decided that it was time to expand NIC to include both direct and indirect care treatments. The definition of a nursing intervention was revised to include indirect care interventions. A validation survey of some of the indirect care interventions was undertaken when we had a sufficient number developed.

A questionnaire asking about use of 26 indirect care interventions was developed and sent to 500 members of the Academy of Medical Surgical Nursing. This group was chosen as it was felt these generalist nurses would perform most of the interventions. One hundred seventy one usable surveys were returned. Results show that all of the 26 interventions are used in practice which supports the validity of including these in the Classification. The interventions used several times a day by 50% or more of the respondents were: Documentation (97%), Delegation (80%), Order Transcription (77%), Environmental Management (70%), and Technology Management (62%). Several interventions were also used several times a day by 40% or more of the respondents: Controlled Substance Checking (49%), Telephone Consultation (48%), Shift Report (45%), Specimen Management (45%), Visitation Facilitation (43%), and Transport (42%). Those used rarely or only monthly were: Triage (83% rarely, 9% monthly), Code Management (61% rarely, 32% monthly), Product Evaluation (56% rarely, 33% monthly) and Preceptor: Employee (rarely 43%, monthly 40%). Details about the results of this survey, including information on times to perform the interventions and decisions to delegate, are available in a forthcoming manuscript (McCloskey, Bulechek, Moorhead, & Daly, forthcoming).

Validation survey 4--Taxonomy validation The fourth validation survey was a questionnaire developed to assess the meaningfulness of the classes and domains. It was distributed in May, 1993 to a sample of nurses expert in theory development who are members of the Midwest Nursing Research Society (MNRS). One hundred sixty one MNRS members from the interest groups of theory development, qualitative

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methods, and nursing diagnosis were sent questionnaires and 121 usable surveys were analyzed. The sample was, on average, 47 years of age with a mean of 24 years of experience in nursing. Twenty (16%) had a master's degree and the remaining 101 subjects (83%) had a doctorate.

The participants were each supplied with a copy of the complete taxonomy and a questionnaire survey. Each participant was asked to rate each domain and each class as to how characteristic

(1--not at all characteristic to 5--very characteristic) it is on 5 criteria:

Clarity--the class label and definition are stated in clear understandable terms

Homogeneity--all interventions are variations of the same class

Inclusiveness--the class includes every possible intervention

Mutual Exclusiveness--the class excludes interventions which do not belong

Theory Neutral--the class can be used by any institution, nursing specialty, or care delivery model regardless of philosophical orientation

Analysis of the results indicated that the taxonomy was well developed. Specifically, 77% of the respondents rated the domains as either quite characteristic or very characteristic on all criteria and 88% of the respondents rated the classes as either quite characteristic or very characteristic on all criteria. The criteria of theory neutral and mutual exclusiveness received the highest ratings; the criterion of inclusiveness received the lowest ratings.

Based upon both the quantitative and qualitative results revisions were made in the taxonomy. Changes occurred mostly in definitions. Three class names were modified and one new class (Information Management) was created. In addition a few interventions moved classes and some cross referencing was added or omitted. All in all, the review demonstrated the validity of the taxonomy; the changes that were made were done to enhance clarity. Also at this time, all new interventions that had been developed since the publication of the NIC book in 1992 were placed. Most of the interventions were easy to place and needed very little discussion. Table 2 displays the top two levels (domains and classes) of the taxonomy.

PHASE III--CLINICAL TESTING AND REFINEMENT

This phase represents our current work. Three areas are discussed here: field testing, development and use of a feedback and review process, and coding of the taxonomy.

Field testing--A major strength of NIC is its comprehensiveness. NIC includes all interventions that nurses do on behalf of patients. It is useful to nurses in all specialties and in all settings. In Phase III we are working with 5 field sites to implement NIC on their nursing information systems and to establish mechanisms to help others with implementation. The participating sites and a brief description of their computer systems are:

Genesis Medical Center in Davenport, Iowa is a 500 bed community hospital with approximately 680 Registered Nurses physically located on two sites--east and west campus--following a consolidation of two community hospitals in 1994. Nursing

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diagnosis has served as the focus for planning patient care in the west campus site since 1982. A mainframe Spectra 2000 computerized nursing information system based on the North American Nursing Diagnosis Association's (NANDA) list of diagnoses has been used to generate and document patient care plans in this site since 1984. The east campus uses manual care planning.

The *University of Iowa Hospitals and Clinics* in Iowa City Iowa is an 820 bed teaching hospital and a regional tertiary care center with a staff of 1,500 Registered Nurses. The hospital has been computerized since the early 1970's with an IBM mainframe system. The nursing information system called INFORMM was designed in house and implemented for care planning in 1988. On-line documentation of nursing orders began on selected units in 1994

Oaknoll Retirement Residence is an independent living complex and long term care facility located in Iowa City. It has 133 apartments for elderly persons able to live independently and a 48-bed long term care facility (32 skilled and 16 intermediate). The nursing department employs sixteen Registered Nurses. The nursing information system is on an IBM compatible personal computer and uses a MED-COM medical records software program.

Dartmouth-Hitchcock Medical Center is a 435 bed teaching hospital and tertiary care center with a staff of over 650 Registered Nurses located in Lebanon, New Hampshire. The hospital is working with Cerner Corporation of Kansas City to develop a nursing information system. The Cerner applications run on Digital hardware and represent a strongly integrated system based on a relational database.

Loyola University Medical Center's Mulcahy Outpatient Center in Chicago, Illinois is a multispecialty ambulatory care facility with an associated Community Nursing Service, a Hospice program, and a Nurse Managed Center. In 1994 the ambulatory programs provided 226,126 patient visits and employed 223 Registered Nurses. The medical center hospital uses a Technicon (TDS) medical information system called LUCI. The system is installed in the Outpatient Center but the care planning and documentation functions are not yet on-line.

While the challenges related to computerization of NIC differ some by type of facility, by whether or not they already have a nursing information system, and by sophistication of the staff, several issues are common to all. Based upon the field site work, we have written "Steps for Implementation of NIC in a Clinical Practice Agency" (see Table 3) in order to help others who are beginning to implement NIC. ("Steps for Implementation of NIC in an Educational Setting" has also been written to assist educators to implement NIC.)

As the nurses in the clinical agencies began to use NIC interventions, they noted linkages with nursing diagnoses. One of the team members who is also Director of Nursing at one of the field sites, assisted by other team members, undertook a series of steps to link NIC interventions to NANDA nursing diagnoses. The second edition of the NIC book includes linkages of NIC interventions with 128 NANDA nursing diagnoses (See one example in Table 4)..

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We are also working with the agencies to determine mechanisms whereby we can study the relationships between diagnoses, interventions, and outcomes. We hope to work out mechanisms so that we can address three research questions:

1. What interventions typically occur together? When information is systematically collected about the treatments nurses perform, then clusters of interventions that typically occur together for certain types of patients can be identified. For example, in caring for a burn patient, we would expect to see interventions used from the NIC classes on Electrolyte and Acid-Base Management, Physical Comfort Promotion, Psychological Comfort Promotion, Nutrition Support, Coping Assistance, Risk Management and perhaps others depending on the location and size of the burn. We need to begin to identify interventions that are frequently used together for certain types of patients so we can study their interactive effects. This information will also be useful in the construction of critical paths (multidisciplinary care plans), in determining costs of services, and in planning for resource allocation.

2. What nurses use which interventions? Systematic documentation of intervention use will allow us to study and compare the use rate of particular interventions by type of unit and facility. Implementation of NIC will allow us to learn which interventions are used by which nursing specialties. Determining the interventions used most frequently on a specific type of unit or in a certain type of agency will help to determine which interventions should be on that unit's/agency's nursing information system. It will also help in the selection of personnel to staff that unit and in the structuring of the continuing education provided to the personnel on these units. While medicine has a good array of studies about physician practices, nursing has no studies comparing the use of nursing interventions by different providers, or even by type of unit. This has been difficult for a number of reasons. The development and implementation of a standardized list of nursing treatments now makes it possible to compare interventions used in one setting versus those used in another.

3. What are the related diagnoses and outcomes for particular interventions? The construction and use of retrievable clinical databases will allow nursing to build a body of science based up the study of actual patient care. Documentation of care with standardized classifications allows for the integration of research and practice. Researchers will use the data collected by practitioners in different settings and be able to address more complex research questions. Knowing which interventions work best for specific diagnoses and lead to certain outcomes can help us construct nursing curricula that prepare better nurses and can be used to assist nurses to make better clinical decisions.

Development and use of a feedback and review process--In the first edition of NIC a Review Form was included which allowed users to make suggestions for new interventions, as well as suggestions for revision of existing interventions. Since the publication of the first edition, a process for review of submissions has been established:

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1. The proposed suggestion is sent to 2 to 3 reviewers who are chosen based upon their expertise in the content area and on their familiarity with NIC.
2. The reviewers are asked to comment on the form of the intervention, the content of the intervention, and to make a recommendation.
3. The recommendations and comments of the reviewers are reviewed by a small group of team members and a decision about inclusion in NIC is made. Major recommendations for change are brought to the entire team for discussion.
4. The submitter is informed of the final decision.

In the past two years since the publication of NIC, approximately a dozen submissions for new or revised interventions have been received. In the future, as NIC is better known and used in more places, more suggestions are expected.

Based upon the suggestions from those who were surveyed in the validation studies and from submissions of individuals, we have begun an "Interventions Under Consideration" list. This is a list of ideas for new interventions that may be missing and needed in NIC. Sometimes, when an idea is further explored and begun to be worked up for a new intervention it is discovered that NIC already includes the intervention (just called something else). In order to keep a taxonomy current with practice changes, there should always be a list of suggestions for new interventions.

Coding of the taxonomy--In order to facilitate computerization, we have put numbers on the interventions and the taxonomy structure. A detailed description of the coding process used to assign numbers to NIC interventions is available in another publication (Iowa Intervention Project, 1995). Each intervention has a unique number consisting of four spaces (e.g. 0140). All interventions that are cross-referenced are coded with their primary class (the class in which most of them are categorized). (See Table 5 for an example of one domain with coded interventions.) The codes for the 6 domains are 1-6; the codes for the now 27 classes are A-Y plus a and b. The Health System domain is last in the taxonomy with the last two of its three classes containing indirect care interventions coded with small letters (a and b). The use of small letters signals that these classes include interventions that, while important to patient progress and outcomes, may not be those that are billed for directly. (That is, these may be part of the overhead, rather than direct costs.) If one desires to know the domain and class the intervention is in, then one would use the domain and class designations with a hyphen between these and the intervention. That is, 1A-0140 is Body Mechanics Promotion; 3P-4700 is Cognitive Restructuring and so on. Activities are coded after the decimal using two spaces (e.g. 1A-0140.01). At this point in time, activities do not have a unique number. It is possible, in the future, after more work with the field sites to determine how the activities are used in practice and in documentation, that we will standardize more of the activities in NIC. Right now, however, this level of the Classification is seen as one place where care may be individualized. The NIC activities will be modified as needed to meet the needs of a particular patient or particular patient population. At this point in time, we feel that the various ways of describing similar ideas are valuable. We continue to believe that there is a range of certain wordings with which clinicians are comfortable and that forcing the activity wording into a single expression would be less acceptable to some users.

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CONCLUSION

A large research team has been working since 1987 to construct, validate, and implement a standardized language for nursing treatments. A variety of qualitative and quantitative methods have been used, including content analysis, survey to experts, focus group review, similarity ratings, hierarchical analysis, and multidimensional scaling. Field testing of the Classification is ongoing in five clinical sites. In addition numerous health care agencies are beginning to adopt NIC for use in standards, care plans, nursing information systems; nursing education programs are beginning to use NIC; authors of major texts are beginning to use NIC to discuss nursing treatments; and researchers are using NIC to study the effectiveness of nursing care.

There are many indications that NIC is becoming a national standard. NIC is recognized by the American Nurses' Association as one classification to be used in a unified nursing language. It was added in 1993 as one of the first two nursing languages in the National Library of Medicine's Metathesaurus for a Unified Medical Language. Both the Cumulative Index to Nursing Literature (CINAHL) and Silver Platter have added NIC to their nursing indexes. NIC is included in the Joint Commission on Accreditation for Health Care Organization's (JCAHO) manual as one nursing classification system that can be used to meet the standard on uniform data. The National League for Nursing has made a 40 minute video about NIC. SNOMED (Systematized Nomenclature of Medicine) will include NIC in their next edition. Interest in NIC has been demonstrated in several other countries, notably, Canada, Denmark, Iceland, Switzerland, and The Netherlands. NIC is a central part of the International Council of Nurses' (ICN) International Classification of Nursing Practice. A parallel classification on patient outcomes sensitive to nursing care is also in development at Iowa. A proposal to establish a Center for Nursing Classification which would house both classifications is at an early stage of discussion at the University of Iowa.

The use of NIC to plan and document care will facilitate the collection of large data bases which will allow us to study the effectiveness and cost of nursing treatments. The use of standardized language provides for the continuity of care and enhances communication among nurses and among nurses and other providers. NIC provides nursing with the treatment language that is essential for the computerized health care record. The domains and classes provide a description of the essence of nursing. NIC is helpful in representing nursing to the public and in socializing students to the profession. The coded interventions can be used in documentation and in reimbursement. For the first time in the history of nursing, nurses have a language which can be used to describe their treatments. The language is comprehensive and can be used by nurses in all settings and in all specialties.

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Figure 1. Example of a NIC Intervention

1200 **Total Parenteral Nutrition (TPN) Administration**

DEFINITION: Preparation and delivery of nutrients intravenously and monitoring of patient responsiveness

ACTIVITIES:

- Assist with insertion of central line
 - Insert peripheral intravenous central catheter per agency protocol
 - Ascertain correct placement of intravenous central catheter by x-ray
 - Maintain central line patency and dressing per agency protocol
 - Monitor for infiltration and infection
 - Check the TPN solution to ensure correct nutrients are included as ordered
 - Maintain sterile technique when preparing and hanging TPN solutions
 - Use an infusion pump for delivery of TPN solutions
 - Maintain a constant flow rate of TPN solution
 - Avoid rapidly replacing lagging TPN solution
 - Monitor daily weight
 - Monitor intake and output
 - Monitor serum albumin, total protein, electrolytes, glucose, and chemistry profile
 - Monitor vital signs
 - Monitor urine glucose for glycosuria, acetone, and protein
 - Administer insulin as ordered, to maintain serum glucose in the designated range as appropriate
 - Report abnormal signs and symptoms associated with TPN to the physician and modify care accordingly
 - Maintain universal precautions
-

BACKGROUND READINGS:

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Source: Iowa Intervention Project -- McCloskey, J.C., & Bulechek, G.M. (Eds.). (1992). Nursing Interventions Classification (NIC). St. Louis: Mosby-Year Book.

Table 1. Definitions of Terms

Nursing Intervention

Any treatment, based upon clinical judgment and knowledge, that a nurse performs to enhance patient/client outcomes. Nursing interventions include both direct and indirect care; both nurse-initiated, physician-initiated and other provider-initiated treatments.

A direct care intervention is a treatment performed through interaction with the patient(s). Direct care interventions include both physiological and psychosocial nursing actions; both the "laying on of hands" actions and those that are more supportive and counseling in nature.

An indirect care intervention is a treatment performed away from the patient but on behalf of a patient or group of patients. Indirect care interventions include nursing actions aimed at management of the patient care environment and interdisciplinary collaboration. These actions support the effectiveness of the direct care interventions.

A nurse-initiated treatment is an intervention initiated by the nurse in response to a nursing diagnosis; an autonomous action based on scientific rationale that is executed to benefit the client in a predicted way related to the nursing diagnosis and projected outcomes. These actions would include those treatments initiated by advanced nurse practitioners.

A physician-initiated treatment is an intervention initiated by a physician in response to a medical diagnosis but carried out by a nurse in response to a "doctor's order." Nurses may also carry out treatments initiated by other providers, such as pharmacists, respiratory therapists, or physician assistants.

Nursing Activities

The specific behaviors or actions that nurses do to implement an intervention and which assist patients/clients to move toward a desired outcome. Nursing activities are at the concrete level of action. A series of activities is necessary to implement an intervention.

Patient

A patient is any individual, group, family, or community who is the focus of nursing intervention. The term patient is used in this book but, in some settings, client may be the preferred term.

Source: Iowa Intervention Project -- McCloskey, J.C., & Bulechek, G.M. (Eds.). (1996). Nursing Interventions Classification (NIC) (2nd ed.). St. Louis: Mosby-Year Book.

Table 2. Top Two Levels of the NIC Taxonomy

NIC TAXONOMY		DOMAIN 1	DOMAIN 2	DOMAIN 3	DOMAIN 4	DOMAIN 5	DOMAIN 6
Level 1 Domains	1. PHYSIOLOGICAL: BASIC Care that supports physical functioning	2. PHYSIOLOGICAL: COMPLEX Care that supports homeostatic regulation	3. BEHAVIORAL Care that supports psychosocial functioning and facilitates life style changes	4. SAFETY Care that supports protection against harm	5. FAMILY Care that supports the family unit	6. HEALTH SYSTEM Care that supports effective use of the health care delivery system	
Level 2 Classes	<p>A <u>Activity and Exercise Management</u>: Interventions to organize or assist with physical activity and energy conservation and expenditure</p> <p>B <u>Elimination Management</u>: Interventions to establish and maintain regular bowel and urinary elimination patterns and manage complications due to altered patterns</p> <p>C <u>Immobility Management</u>: Interventions to manage restricted body movement and the sequelae</p> <p>D <u>Nutrition Support</u>: Interventions to modify or maintain nutritional status</p> <p>E <u>Physical Comfort Promotion</u>: Interventions to promote comfort using physical techniques</p> <p>F <u>Self-Care Facilitation</u>: Interventions to provide or assist with routine activities of daily living</p>	<p>G <u>Electrolyte and Acid-Base Management</u>: Interventions to regulate electrolyte/acid base balance and prevent complications</p> <p>H <u>Drug Management</u>: Interventions to facilitate desired effects of pharmacologic agents</p> <p>I <u>Neurologic Management</u>: Interventions to optimize neurologic function</p> <p>J <u>Perioperative Care</u>: Interventions to provide care prior to, during, and immediately after surgery</p> <p>K <u>Respiratory Management</u>: Interventions to promote airway patency and gas exchange</p> <p>L <u>Skin/Wound Management</u>: Interventions to maintain or restore tissue integrity</p> <p>M <u>Thermoregulation</u>: Interventions to maintain body temperature within a normal range</p> <p>N <u>Tissue Perfusion Management</u>: Interventions to optimize circulation of blood and fluids to the tissue</p>	<p>O <u>Behavior Therapy</u>: Interventions to reinforce or promote desirable behaviors or alter undesirable behaviors</p> <p>P <u>Cognitive Therapy</u>: Interventions to reinforce or promote desirable cognitive functioning or alter undesirable cognitive functioning</p> <p>Q <u>Communication Enhancement</u>: Interventions to facilitate verbal and nonverbal messages</p> <p>R <u>Coping Assistance</u>: Interventions to assist another to build on own strengths, to adapt to a change in function, or achieve a higher level of function</p> <p>S <u>Patient Education</u>: Interventions to facilitate learning</p> <p>T <u>Psychological Comfort Promotion</u>: Interventions to promote comfort using psychological techniques</p>	<p>U <u>Crisis Management</u>: Interventions to provide immediate short-term help in both psychological and physiological crises</p> <p>V <u>Risk Management</u>: Interventions to initiate risk reduction activities and continue monitoring risks over time</p>	<p>W <u>Childbearing Care</u>: Interventions to assist in understanding and coping with the psychological and physiological changes during the childbearing period</p> <p>X <u>Lifespan Care</u>: Interventions to facilitate family unit functioning and promote the health and welfare of family members throughout the lifespan</p>	<p>Y <u>Health System Mediation</u>: Interventions to facilitate the interface between patient/family and the health care system</p> <p>a <u>Health System Management</u>: Interventions to provide and enhance support services for the delivery of care</p> <p>b <u>Information Management</u>: Interventions to facilitate communication among health care providers</p>	

Source: Iowa Intervention Project -- McCloskey, J.C., & Bulechek, G.M. (Eds.). (1996). Nursing Interventions Classification (NIC) (2nd ed.). St. Louis: Mosby-Year Book.

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Table 3. Steps for Implementation of NIC in a Clinical Practice Agency

(These assume that the decision to implement has been made and that the leadership group who made the decision are familiar with the NIC book and other key readings.)

A. Establish organizational commitment to NIC

- Identify the key person responsible for implementation (e.g. person in charge of nursing informatics).
- Create an implementation task force with representatives from key areas.
- Provide NIC materials (and supporting materials, such as Nursing Minimum Data Set readings) to all members of the task force.
- Invite a member of the NIC project team to do a presentation to the staff nurses (to create interest and excitement) and to meet with the task force.
- Purchase copies of the NIC book/taxonomy—one per unit and encourage nurses to buy own copies.
- Circulate readings about NIC and The NIC Letter to units. Show the NIC video.
- Have members of the task force and other key individuals begin to use the NIC language in every day discussion.
- Have key individuals from the task force sign onto the NIC List Serve.

B. Prepare an implementation plan

- Write the specific goals to be accomplished with implementation.
- Do a force field analysis to determine driving and restraining forces.
- Determine if an in-house evaluation will be done and, if so, what is the nature of the evaluation effort.
- Identify which of NIC interventions are most appropriate—not appropriate for the agency/unit. (Distribution of the NIC use survey can facilitate this identification or create a task force of clinical experts to decide.)
- Determine the extent to which NIC is to be implemented; for example, in standards, care planning, documentation, discharge summary, performance evaluation. Ensure that all of the appropriate groups have information on NIC.
- Prioritize the implementation efforts. Do first that which will derive the most benefit to staff nurses and patients (for example, something which will decrease charting time).
- Choose 1-3 pilot units (where there is enthusiasm for the project, a very supportive head nurse, and success is likely). Get members from these units involved in the planning.
- Develop a written timeline for implementation. Demonstrate progress so people do not get discouraged. Publicize the timeline so people know what to expect and you are committed.
- Review current system that is in place and determine the logical sequence of actions to integrate NIC into the information system. If current system has nursing activities that should be related to NIC interventions, make assignments to get this done.
- Create work groups of expert clinical users to review NIC interventions and activities, determine how these will be used in agency, and develop needed forms, etc.
- Distribute the work of the expert clinicians to other users for evaluation and feedback before implementation.
- Encourage the development of a *NIC champion* on each of the units.
- Keep other key decision makers in agency informed of your plans, for example, VP for Nursing, physician council, nurse clinician council, agency's informatics group.
- Determine the nature of the total nursing data set. We suggest the following minimum number of variables: patient's id number, date of birth, gender, race, marital status, admission date, number of medications, medical diagnosis, medical treatments, nursing diagnoses, NIC INTERVENTIONS, outcomes expected and achieved, discharge date and disposition, unit type, staff mix, average patient acuity, and workload (e.g. direct hours per patient day divided by actual ftes). Work to ensure that all units are collecting data on all variables in a uniform manner so that future research can be done. (Note, many of these are already collected in a uniform and systematic fashion in a hospital discharge data set or ambulatory discharge data set.)
- Make plans to ensure that all nursing data are retrievable (at least 5 years after collection).
- Identify learning needs of staff and plan ways to address these (for example, is there a need for orientation to computer functions, etc.)

C. Carry out the implementation plan

- Develop the screens/forms for implementation. Review each NIC intervention and decide whether all parts (e.g. label, definition, activities, reference) are to be used. If activities will be used for documentation, determine which are critical activities to document and whether further details are desired. (See attached implementation Rules of Thumb.)
- Provide training time for staff.
- Implement NIC on the pilot unit(s) and obtain regular daily/weekly feedback (process evaluation)..
- Update content or create new computer functions as needed.
- Use focus groups to clarify issues and address concerns/questions. Members of the task force could organize these by unit/division and be the group leaders.
- Use data on positive aspects of implementation in house-wide presentations
- Implement NIC house wide.
- Collect post implementation evaluation data and make changes as needed.
- Identify key markers to use for ongoing evaluation and continue to monitor and maintain the system.

Provide feedback to the Iowa intervention project team on any needed changes in the national language.

Source: Iowa Intervention Project -- McCloskey, J.C., & Bulechek, G.M. (Eds.). (1996). Nursing Interventions Classification (NIC) (2nd ed.). St. Louis: Mosby-Year Book.

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Table 4. Example of NIC Interventions Linked to a NANDA Diagnosis

Hopelessness

Definition:

A subjective state in which an individual sees limited or no alternatives or personal choices available and is unable to mobilize energy on own behalf.

Suggested Nursing Interventions for Problem Resolution:

Complex Relationship Building
Decision-Making Support
Emotional Support
Energy Management
Hope Instillation
Mood Management
Presence
Reminiscence Therapy
Sleep Enhancement
Socialization Enhancement
Support Group

Additional Optional Interventions:

Anger Control Assistance
Animal Assisted Therapy
Activity Therapy
Cognitive Stimulation
Counseling
Crisis Intervention
Distraction
Exercise Promotion
Exercise Therapy: Ambulation
Grief Work Facilitation
Grief Work Facilitaiton: Perinatal Death
Music Therapy
Mutual Goal Setting
Patient Contracting
Play Therapy
Self-Care Assistance
Spiritual Support
Suicide Prevention

Source: Iowa Intervention Project -- McCloskey, J.C., & Bulechek, G.M. (Eds.). (1996).
Nursing Interventions Classification (NIC) (2nd ed.). St. Louis: Mosby-Year Book.

Table 5. Example of One Domain with Coded Interventions

2. PHYSIOLOGICAL: COMPLEX Care that supports homeostatic regulation										
Level 1 Domains	Level 2 Classes	G	H	I	J	K	L	M	N	
		Electrolyte and Acid-Base Management Interventions to regulate electrolyte/acid base balance and prevent complications	Drug Management Interventions to facilitate desired effects of pharmacologic agents	Neurologic Management Interventions to optimize neurologic function	Perioperative Care Interventions to provide care prior to, during, and immediately after surgery	Respiratory Management Interventions to promote airway patency and gas exchange	Skin/Wound Management Interventions to maintain or restore tissue integrity	Thermoregulation Interventions to maintain body temperature within a normal range	Tissue Perfusion Management Interventions to optimize circulation of blood and fluids to the tissue	
Level 3 Interventions		1910 Acid-Base Management 1911 Acid-Base Management 1912 Metabolic Acidosis 1913 Acid-Base Management 1914 Acid-Base Management 1915 Respiratory Acidosis K* 1916 Acid-Base Management 1917 Respiratory Alkalosis K 1918 Acid-Base Monitoring 2000 Electrolyte Management 2001 Electrolyte Management 2002 Hypercalcemia 2003 Electrolyte Management 2004 Electrolyte Management 2005 Electrolyte Management 2006 Hypophosphatemia 2007 Electrolyte Management 2008 Hypokalemia 2009 Electrolyte Management 2010 Hypomagnesemia 2011 Hyponatremia 2012 Electrolyte Management 2013 Hypophosphatemia 2014 Electrolyte Monitoring 2080 Fluid/Electrolyte Management N 2100 Hemodialysis Therapy 2120 Hypoglycemia Management 2130 Hypoglycemia Management 2150 Peritoneal Dialysis Therapy 4232 Phebotomy Arterial Blood Sample M 1200 Total Parenteral Nutrition (TPN) Administration D	2210 Analgesic Administration 2214 Analgesic Administration: Intraspinal 2840 Anesthesia Administration J 2240 Chemotherapy Management S 2280 Conscious Sedation Medication 2300 Medication Administration: Administration: Enteral 2302 Medication Administration: Interpleural 2303 Medication Administration: Intraosseous 2304 Medication Administration: Oral 2305 Medication Administration: Parenteral 2306 Medication Administration: Topical 2307 Medication Administration: Ventricular Reservoir 2340 Medication Management 2390 Medication Prescribing 2400 Patient Controlled Analgesia (PCA) Assistance Teaching 5816 Prescribed Medication S 2440 Venous Access Devices (VAD) Maintenance N	2540 Cerebral Edema Management 2550 Cerebral Perfusion Management 2590 Dysreflexia Management 2590 Intracranial Pressure (ICP) Monitoring 2620 Neurologic Monitoring 2680 Peripheral Sensation Management 0844 Positioning: Neurologic Seizure Management V 2690 Seizure Precautions Subarachnoid Hemorrhage Tube Care: Ventriculostomy/Lumbar Drain 2760 Unilateral Neglect Management	2640 Anesthesia Administration H 2660 Autotransfusion M 6645 Infection Control: Intraoperative Positioning: 0642 Intraoperative Postanesthesia Care 2670 Preoperative Coordination Y 2680 Surgical Assistance 2690 Surgical Precautions V 2690 Surgical Preparation 5610 Teaching: Preoperative S 3902 Temperature Regulation: Intraoperative M	1913 Acid-Base Management Respiratory Acidosis G 1914 Acid-Base Management: Respiratory Alkalosis G 3120 Airway/Intubation and Stabilization 3140 Airway Management 3160 Airway Suctioning 3180 Artificial Airway Management 3200 Aspiration Precautions V 3230 Chest Physiotherapy 3250 Cough Enhancement 4106 Embolus Care: Pulmonary N 3270 Endotracheal Extubation 3300 Mechanical Ventilation 3310 Mechanical Ventilation 3320 Oxygen Therapy 3350 Respiratory Monitoring 1872 Tube Care: Chest 3390 Ventilation Assistance	3420 Amputation Care 3440 Leech Therapy 0480 Ostomy Care B 3500 Pressure Management 3520 Pressure Ulcer Care 3540 Pressure Ulcer Prevention V 3584 Skin Care: Topical 3590 Skin Surveillance 3620 Suture Wound Care: 3662 Wound Care: Closed Drainage 3680 Wound Irrigation	3740 Fever Treatment 3780 Heat Exposure Treatment 3800 Hypothermia Treatment 3940 Malignant Hyperthermia Precautions U 3900 Temperature Regulation 3902 Temperature Regulation: Intraoperative J	2660 Autotransfusion J 4010 Bleeding Precautions 4020 Bleeding Reduction: Antepartum Uterus W 4022 Bleeding Reduction: Gastrointestinal 4024 Bleeding Reduction: Nasal 4028 Postpartum Uterus W 4028 Bleeding Reduction: Wound 4030 Blood Products Administration 4040 Cardiac Care 4044 Cardiac Care: Acute 4046 Cardiac Care: Rehabilitative 4050 Cardiac Precautions 4080 Circulatory Care 4084 Circulatory Care: Mechanical Assist Device 4070 Circulatory Precautions 4080 Dysrhythmia Management 4104 Embolus Care: Peripheral 4106 Embolus Care: Pulmonary K 4110 Embolus Precautions 2080 Fluid/Electrolyte Management G 4120 Fluid Management 4130 Fluid Monitoring 4140 Fluid Resuscitation 4150 Hemodynamic Regulation 4160 Hemorrhage Control 4170 Hypovolemia Management 4180 Hypovolemia Management 4190 Intravenous (IV) Therapy 4200 Invasive Hemodynamic Monitoring 4210 Peripherally Inserted Central (PIC) Catheter Care 4232 Phebotomy Arterial Blood Sample G 4234 Phebotomy Blood Unit Acquisition 4238 Phebotomy: Venous Blood Sample 4250 Shock Management 4254 Shock Management: Cardiac 4256 Shock Management: Vasogenic 4258 Shock Management: Volume 4260 Shock Prevention 2440 Venous Access Devices (VAD) Maintenance H	4000 to 4299
		1900 to 2199	2200 to 2499	2500 to 2799	2800 to 3099	3100 to 3399	3400 to 3699	3700 to 3999	4000 to 4299	

Source: Davis Intervention Project - McCloskey, J.C. & Bulechek, G.M. (Eds.) (1996). Nursing Interventions Classification (NIC). 2nd ed. Philadelphia: W.B. Saunders Company.