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Block #19 - occurred. A final curriculum was developed based on lessons learned during the teaching phase.

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Workload Management System for Nursing**

**A Graduate Management Project**

**Submitted to the Faculty of**

**Baylor University**

**In Partial Fulfillment of the**

**Requirements for the Degree**

**of**

**Master of Health Administration**

**by**

**Major Margaret A. T. Horrell, MS**

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## **Author Notes**

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**Abstract**

This project was intended to solve the problem of the lack of physician knowledge at Irwin Army Community Hospital about the *Workload Management System for Nursing (WMSN)*. It explores what nurses think physicians should know about nursing to perform their physician tasks in a manner that uses the scarce resources of nursing in the most efficient way possible. The objectives of the study were to: determine what the physician needs to know, and create a method for teaching it; and evaluate the change in physician knowledge that is expected to result from the education. An interview process was used with a group of nurses familiar with the WMSN to determine what physicians needed to know about the WMSN. This resulted in the development of a survey instrument that represents the sets of WMSN knowledge required by physicians. The second step of the project was to develop a curriculum based on the knowledge sets. This initial curriculum was taught to a group of physicians at Irwin Army Community Hospital. The physicians took a pre-test and a post-test, to assist in validating the change in their knowledge and to adjust the material to their needs. Two iterations of curriculum development occurred. A final curriculum was developed based on lessons learned during the teaching phase.

**CHAPTER I**

**Introduction**

**Conditions Which Prompted the Study**

Scarce resources have always determined the methods by which management solves problems and provides services. Nurses have become a scarce resource. Dollars have become even more scarce. The scarcity of nursing and fiscal resources is driving a review of utilization methods. In the past, nurses simply complied with a physician's orders, even if this required a higher level of staffing for that area or ward. Nurses have long felt that physicians are often not aware that their orders may not always reflect efficient use of the nursing staff and that at times, those orders may, in fact, do the opposite by creating unnecessary workload and expense in the nursing arena. Efficient use of future resources demands that physicians know the effect of their orders on the resources of the nursing department.

**Statement of the Management Problem**

Physicians at Irwin Army Community Hospital do not know enough about the Workload Management System for Nurses to use it effectively. The goal of this project was to create a curriculum for

physicians that has a built-in evaluation system for changing the curriculum as physician needs change.

### Review of the Literature

Overview. Prospective payment has created a desire for improved internal operating efficiency by nurse executives and hospital administrators. A shortage of nurses who are active in the practice of nursing has also added to the need for internal operating efficiency, especially in the inpatient setting. Since nursing managers are responsible for maintaining the quality of nursing care, they must have a systematic means for assessing the proper distribution of their staff resources in proportion to the needs of the patients and considering their current expenditures and for projecting future needs. A well-established patient acuity system (sometimes called a *patient classification system*) tailored to a given institution's resources, standing operating procedures, and working environment, is a powerful tool for controlling operations and justifying managerial decisions.

In the dictionary sense, *classification* is a means of grouping, ordering, or arranging objects or concepts into sets, based on relationships among the objects or concepts. The term *inpatient classification* is frequently used within the nursing profession and has

come to refer specifically "to the hundreds of different methods and procedures used to group patients according to their requirements for nursing care for the purposes of nursing staff determination and allocation" (Giovannetti, 1985, p. 88).

In the nursing field, an *acuity system* is "a measurement tool that provides data to assist nurse executives in justifying the number of RNs and paraprofessionals necessary to staff an acute care unit" (Adams & Johnson, 1986, p. 21). A patient classification or patient acuity system assumes "that the nursing process is measurable, that nursing process activities constitute a set of interrelated functions which are measurable, and that the needs of the patients can be identified" (Philibert, 1986, p. 60). Through physician orders and nursing assessment, each patient's needs are identified, assigned a value weighted integer, and transformed into nursing care hours. Physicians' orders have a direct impact on nursing care hours.

In the civilian sector, nursing managers have recognized the need to monitor costs and identify potential areas for change, in attempts to decrease expenditures. Acuity systems are being used not only to determine staffing, but also to estimate direct nursing costs under associated Diagnosis Related Groups. Acuity systems can be

used to monitor the degree to which physician orders impact on nursing care costs.

The Army nursing community has established a workload management system to perform some of the same functions as those of the civilian patient classification and patient acuity systems. The Army system has been automated and is being used primarily by nursing staff managers to determine and project workload needs. Administrators outside of the nursing department are becoming interested in the system because "overall, this system provides a corporate tool which will allow the best use of people, as well as estimate future staffing needs based on changes such as: expanding services, changing missions, or an increase in the intensity of care" (Vail, 1985, p. 2).

History. The need to match the patient's needs to available nursing staff has existed for as long as nursing itself. Florence Nightingale wrote that "one sick person is often waited on by four with less precision, and is really less cared for than ten who are waited on by one. . ." (Nightingale, 1859, p. 24).

Patient classification literature in the United States dates from 1922, when the New York Academy of Medicine recommended five hours and four minutes of nursing care in a twenty-four-hour period

for each patient. In 1936, the National League of Nursing Education recommended dividing the amount of time required per patient into eight age and disease categories. The first recorded time that patients were actually classified based on required care was in 1960, at Johns Hopkins University (Kirby, 1986). Part of the drive toward classification systems came from the results of two studies on the relationship between nurse staffing and patient welfare. These two studies, conducted about twenty-five years ago, showed that although each patient received more direct nursing care the average level of patient welfare did not rise. Later studies, in the 1970s, focused on the differences between *primary* nursing and *team* nursing (Flood & Diers, 1988). Beginning in the late 70s and continuing to this time, articles about patient classification systems revolve around the creation of new systems or the evaluation and comparison of older systems.

In 1980, Vaughn and MacLeod divided the reasons for having a patient classification system into two categories of objectives. They called these "short-term " and "long-term" objectives. The "short-term" objective balances manpower requirements with staff for each area and shift. The "long-term" objective summarizes *actual* versus *required* staff over a period of time, for the purpose of hiring

decisions. "Most hospitals in the United States currently use some form of patient classification system to determine nursing staffing requirements for short-range and/or long-range planning. . ."

(Hoffman, Schaefer, and Zuraikal, 1986, p. 13). The current point of contention is which system is best for whom and how management can use the selected system to make both "short" and "long-term" decisions (Vaughn & MacLeod, 1980).

The increased use of patient classification systems within hospitals has led to substantial duplication of effort. Numerous systems have been developed, each of which may be used within only one hospital. To wish to develop one's own system is understandable since it is important that the instrument accurately measure what it is intended to measure: the extent of patient dependency on nursing care under different unit conditions. The numbers of staff required to provide that nursing care is influenced by architectural and operating features of the nursing unit, medical care practices, nursing care standards and policies, etc. (Williams, 1988, p. 90)

In the past, nursing care costs were included in the charge for room and board. "Today, nursing departments actively seek ways of identifying nursing care costs so that nursing can be seen as a valid

revenue center" (Grohar, Myers, & McSweeney, 1986, p. 19). A further impetus to identify the real cost of nursing came with the implementation of the *Diagnosis Related Group (DRG)* prospective payment system, itself a patient classification system. Improved efficiency is driving the need for information. Patient classification systems are seen as one method of supplying that need, because they provide an objective method to assess patients' needs. Furthermore, the nurse is seen as an "honest broker" for the patient, with no individual gain to be derived from the system (Speer, 1990), making nursing classification systems less suspect than some of the other classification systems available.

In 1981, JCAH Standard II for Special Care Units required that "each special care unit shall be properly directed and staffed according to the nature of the special patient care needs anticipated and the scope of services offered" (Ambutas, 1987, p. 364). Further, in 1986 the standards set forth by the Joint Commission on Accreditation of Hospitals (JCAH) stated that the nursing department will "define, implement, and maintain a system for determining patient requirements for nursing care on the basis of demonstrated patient needs, appropriate nursing intervention, and priority of care" (JCAH, 1986, p. 133). Even more recently, in the 1990 Accreditation Manual

for Hospitals Standard NR 4.4, the Joint Commission for the Accreditation of Health Care Organizations (JCAHO) stated that "The nursing department/service defines, implements, and maintains a system for determining patient requirements for nursing care on the basis of demonstrated patient needs, appropriate nursing intervention, and priority for care" (JCAHO, 1989, p. 130). These standards seem to mandate, legitimize, and guarantee the continuance of the various systems of patient classification.

Types of Patient Classification Systems. Usually patient categories are based on the amount of care required (Ruman, Krueger, & Nelson, 1988). Acuity is most often based on the severity of illness, and is a direct reflection of the amount of nursing care required. *Severity* has as many definitions as there are writers. Some of the most common were collected by Thomas and Longo in their article *Application of Severity Measurement Systems for Hospital Quality Management:*

### Varying Definitions of Severity

Author	Definition of Severity
Brewster et al. (1985)	"potential for organ failure"
Coffee and Goldfarb (1986)	"disease progression toward death (or physical impairment, if death is an unlikely outcome for a specific disease)"
Gonella, Hornbook, and Louis (1984)	"risk of death or temporary or permanent impairment"
Horn (1986)	"quantification of patient's total burden of illness"
Knaus et al. (1981).	"probability of mortality"
Kreitzer, Liebner, & Roveti (1982)	"degree and impact of change on the health status of an individual as a result of illness or injury"
Schweiker (1982)	"risk of immediate death or permanent loss of function"
Smits, Fetter, & McMahon (1984)	"impact of the particular disease process on patient's physiologic integrity"

(Thomas & Longo, 1990, p. 223)

If the differences in definitions were not already confusing enough, the systems that have grown as measures of severity from these definitions are even more diverse. A good feel for the diversity comes from a summary description by Iezzoni in her article entitled *Using Severity Information for Quality Assessment: A Review of Three Cases by Five Severity Measures:*

**Summary Description of Severity Measures**

Severity Measure	Data Requirements	Definition of Severity	Diagnosis Used	Classification System
APACHE II	Chart review	Risk of imminent death	No	Score from 0 to 71 indicating overall patient severity.
Computerized Severity Index	Chart review	Treatment difficulty presented to physicians	Yes	Score from 1 to 4 for patient overall and for each ICD-9-CM diagnostic code.
Disease Staging Q-Scale	Discharge abstract	Resource needs	No	Percentage compared with an average of 100 indicating overall patient severity.
Critical Criteria Version	Chart review	Risk of death or functional impairment	Yes	Stage from 1.0 to 4.0 with substages for each disease present.
MedisGroups	Chart review	Risk of imminent organ failure	No	Score from 0 to 4 on admission and morbidity score at mid-stay review indicating overall severity.
Patient Management Categories	Discharge abstract	Resource needs	Yes	Cost-based relative weight compared with an average of 1.0; also classifies based on major surgery.

(Iezzoni, 1989, p. 376)

"Acuity", "category", and "patient classification" mean different things to different people, yet they sometimes mean exactly the same thing. They all, however, have some common elements: (a) a method for grouping patients, (b) guidelines for classification, (c) patient care time required by that classification, and (d) some sort of mathematical summary.

The two most common types of classification systems are *prototype* and *factor evaluation*. The prototype system provides broad descriptions of characteristics for a patient which are typical for a certain category, and the patient is placed into the

category which most closely represents him. Factor evaluation has a number of critical indicators that are separately rated numerically and then combined. The total numerical value places the patient into a certain category. (Ambutas, 1987, p. 364)

In 1984, Shroeder, Rhodes, and Shields conducted a study to compare two very different nursing acuity systems. Their study revealed little difference between the systems in regard to the staffing requirements identified. Although a fair amount of argument still exists as to the merits of the various systems available, a definite move is being made toward a common or standard system.

Major Classification Systems. Five major patient classification systems have emerged in recent years. The first of these, DRGs, are perhaps the most recognized.

Diagnosis Related Groups (DRGs) were developed by a group of researchers at Yale University to identify a set of case types, each representing a class of patients with similar processes of care and receiving a predictable bundle of services (i.e., a product) from an acute care hospital. (Rosko, 1988, p. 257)

To date, two different DRG systems have been used to effect the prospective payment system in the state and federal sectors.

**In 1980, the State of New Jersey operated the first DRG-based hospital rate regulation program. Under this system, prospective payment rates were established for 383 DRGs which were based on ICDA-8 nomenclature. In 1983, the Medicare program implemented a prospective pricing mechanism based on a second generation DRG system which consists of patient categories and uses the ICD-9-CM diagnostic codes. (Rosko, 1988, p. 258)**

**It is felt that "deficiencies in the ICD-9-CM coding system directly affect the equity of the Medicare payment system" (McMahon & Smits, 1986, p. 562). The principal problem involves the inability of the DRG system to reflect patient acuity. In 1985, in a rather successful attempt to resolve this problem, patient costs were predicted by combining nursing acuity data with DRG data. This method resulted in an 89 percent accuracy rate (Curtin, 1985).**

**Around the same time, the second patient classification system was emerging, in the Department of Defense (DOD) environment. A study was conducted under the auspices of the Health Care Studies Division, Academy of Health Sciences, Fort Sam Houston, Texas. This study, published in September 1981, was intended to "develop an improved patient classification system which would provide a better**

staffing mix based on quantified direct nursing care requirements for critical care, medical/surgical, obstetric, psychiatric, neonatal, and pediatric inpatient clinical services" (Sherrod, Rauch, & Twist, 1981, v). This system, now called the *Workload Management System for Nursing (WMSN)*, was directed to be used throughout the DOD system on March 21, 1989. The WMSN has recently been automated. The automated WMSN is called the *Workload Management System (WMS)*. WMSN is being used as a patient classification standard and as a manpower standard. The WMSN combines an objective factor-evaluation patient classification system with a staffing methodology (Vail, Norton, & Rimm, 1986).

Researchers from Thomas Jefferson Medical College and Systemetrics, Inc. developed the third system, a *disease staging protocol*, using levels of severity.

This system classifies diseases rather than health problems. . . . Diseases are defined by clinicians in specific detail, including location of the problem, manifestation of the medical problem, cause of the problem, and severity of the problem. . . . In general, the four stages of disease (cancer has five) can be described in ascending order of severity as: Stage 1) Conditions with no complications, or problems of minimal

severity; Stage 2) Problems limited to an organ or organ system with increased probability of complications; Stage 3) Generalized systemic involvement, poor prognosis; Stage 4) Death. (Rosko, 1988, p. 259)

The fourth major patient classification system presently on the scene was developed by researchers at Johns Hopkins University and is called the *Severity of Illness Index (SSI)*.

The SSI is an ordinal measure of patient severity consisting of four levels. The assessment of severity depends upon the scores for the following seven variables:

1. Stage of the principal diagnosis
2. Complications of the principal diagnosis
3. Concurrent interacting conditions that affect the hospital episode of treatment
4. Dependency on the hospital staff
5. Extent of non-operating room procedures
6. Rate of response to therapy or rate of recovery
7. Residual impairment remaining after therapy for the acute aspect of the hospitalization. (Rosko, 1988, p. 260)

Training for this system starts with an intensive, three-day session.

Follow-up training is required, and effort has been exerted to get

inter-rater reliability. An offshoot of this index is the *Computerized Severity Index (CSI)*.

In the CSI system a patient is placed in one of four ordinal categories of severity for each disease on the basis of comorbidity, complications, and interactive effects of conditions. The CSI uses information based on laboratory values, vital signs, radiological findings, and other clinical information found in the medical record but not summarized in current discharge abstract forms. Computer software for this system was developed in 1986. (Rosko, 1988, p. 261)

Approximately 800 *Patient Management Categories (PMCs)* were developed by researchers from Blue Cross of Western Pennsylvania, using 50 disease-specific panels of specialist and generalist physicians. PMCs represent the fifth and last major patient classification system.

The PMC protocol relies primarily on diagnosis and secondarily upon clinical procedures. Age and gender serve as additional classification criteria for only a few PMCs. Recognizing that physicians treat symptoms and suspected conditions that may not be suggested by the principal diagnosis, the PMC system also relies on the admitting diagnosis and secondary diagnoses to classify patients. The PMC system also recognizes that patients

with multiple diagnoses can be dichotomized as those who are (1) subject to a single disease process, and (2) comorbid. (Rosko, 1988, p. 162)

Of the major patient classification systems being used, only one of them, the DOD WMSN, is used exclusively (or even mainly) to facilitate nursing management. All of the systems, however, could be adapted to include nursing, or even to target nursing information-gathering as a major goal.

Evaluating Patient Classification Systems.

In 1978, the United States Public Health Service's Division of Nursing published a manual for evaluating hospital staffing requirements based on the results of an eight-year study done at San Joaquin General Hospital. Despite the growing number of patient classification systems in use, Vaughn and MacLeod advocated a standardized system for hospitals across the country. On the other hand, Giovanetti believed that patient classification systems should be tailored to meet the unique needs of individual health care facilities. (Vail, Morton & Rieder, 1987, p. 290)

Although there seems to be a diversity of opinion about patient classification systems that is as varied as there are systems in

existence, Rosko stated in 1988 that they will all provide value under the following circumstances:

1. The classification system must be based on information that is reliable.
2. Patients who consume resources of relatively equivalent values should be grouped together.
3. The number of categories should be manageable.
4. The classification system must be clinically meaningful to physicians.
5. Information used to classify patients must be easily accessible at a reasonable cost. (Rosko, 1988, p. 262)

Present Situation. Because the DRG system has become so pervasively used in the United States, it has been evaluated by nurses to ascertain its reliability in capturing nursing workload.

Of major concern to nursing leaders are questions relating to the potential impact of Diagnostic Related Groups (DRGs) on the nursing professions, particularly with respect to nurse staffing issues. Questions such as 'Will the implementation of prospective cost reimbursement mechanisms based on DRGs render the measurement of nursing workload futile?' and 'Do

DRGs adequately reflect nursing workload?' are frequently asked. (Giovannetti, 1985, p. 88)

The concerns of Giovannetti in 1985 were reiterated in 1988 by Thompson and Diers when they stated that "an inquiry is necessary at this time because it is held that the Diagnosis Related Group Prospective Payment System fails to account for variations in the intensity of nursing services among patients in different DRGs" (Thompson & Diers, 1988, p. 473). A system that cannot capture a major resource cost such as nursing cost would need to be integrated with an "acuity/severity" system that could severity-adjust and thus capture differences in cost efficiency.

Some method to meld a severity system with DRGs has been sought since the advent of diagnosis-based and resource-based patient classification systems.

A complicating factor in the study of the relationship between DRGs and nursing workload measures is that the two classification schemes do not employ the same unit of analysis. As previously noted, DRGs are determined on a per case basis, whereas nursing workload measures yield a coefficient per shift or day based on an aggregate of cases. It would seem that nursing workload measures need to be reduced to a case-specific

level in order to compete with the precedent set by the DRGs.

It is not difficult to obtain this type of information, but few hospitals have policies or procedures to retain this data as part of the patient's permanent record. (Giovannetti, 1985, p. 90)

Presently, patient classification systems are being used to justify manpower, improve personnel utilization, distribute workload, and monitor nursing-related issues such as documentation and quality assurance (Norton & Jones, 1990). Other uses of patient classification systems include establishing historical trend analysis of acuity levels, defining diagnosis-related work factors, combining diagnosis work factors and acuity factors, setting staffing classification ratios according to acuity analysis, predicting inpatient pharmacy workload, establishing quality assurance programs and comparing physicians' practice patterns for efficiency. Lundgren and Daniels (1986) write that "the index of patient acuity of illness and the number of standard hours of nursing care are good predictors of pharmacy workload of the same and following days; the potential exists to use these nursing workload indicators in determining pharmacy staffing requirements" (p. 2453-2459).

An even more extensive and probably the newest use for patient classification systems is to monitor physician performance. "By

gathering severity data, hospital administrators who have struggled with sagging bottom lines now have firm statistics to challenge their medical staffs on the need to control costs" (Brightbill, 1990, p. 26). One company, *Iameter, Inc.*, is using its own system, the *Acuity Index Method (AIM)*, to help a hospital and its medical staff analyze clinical quality. As one author writes, "The system reports demonstrate how these adjusted data can be used initially to document physician and hospital quality and cost efficiency, as well as monitor their respective performance concurrently" (Mohlenbrock, 1989, p. 4).

In the past, one of the drawbacks for patient classification systems was their complicated, time-consuming nature. With the advent of the desktop computer, all stages of the categorization process, from collecting the raw data to reporting results, can be and are being automated.

#### Purpose of the Study

The purpose of this study is to solve the problem of the lack of physician knowledge about the patient classification system used by DOD, the WMSN. The objectives of the study were to: determine what the physician needs to know, and create a method for teaching it; and evaluate the change in physician knowledge that is expected to result from the education.

**CHAPTER II**

**Method and Procedures**

The first step of the study was to determine what sets of WMSN knowledge were required by physicians. The sets of WMSN knowledge required by physicians are represented by the questions on the survey instrument (APPENDIX B). The sets of knowledge and even specific questions were gleaned from interviews with nurses familiar with the WMSN (Graham, Sylvester, Brazil & Worden) at Brooke Army Medical Center (BAMC), Fort Sam Houston, Texas, through observation at both BAMC and Irwin Army Community Hospital, Fort Riley, Kansas, and through literature research. The survey questions were validated by WMSN Project nurse (Worden) and Quality Assurance nurse (Brazil) at BAMC.

The second step of the study was to generate an initial curriculum for physicians based on the knowledge sets in the survey instrument. This material was taught to a group of physicians. The physicians took a pre-test and a post-test, to assist in validating the change in their knowledge and to adjust the material to their needs. Two iterations of curriculum development occurred. A final curriculum was developed based on lessons learned during the teaching phase. Descriptive statistics were used to assist in the

evaluation of the pre- and post-test changes after the initial curriculum had been taught. *Systat*, a statistical package for personal computers by Systat, Inc., was used to process the data. The curriculum and the survey instrument were revised based on the pre- and post-test changes and interviews with the physicians after completion of the teaching phase. The revised survey is at Appendix D.

**CHAPTER III****Results**

**This study involved the creation of a curriculum for physicians, complete with WMSN pre/post test, handouts and visual aids. The revised curriculum is at Appendix C. The pre/post test was designed to provide indicators for change or adjustment of the curriculum based on the knowledge of the students. The class for physicians was taught on a Friday afternoon and lasted two hours. The pre-test and identical post-test were given at the beginning of the two-hour session and at the end, respectively. The pre- and post-tests consisted of the questions found in Appendix B, the survey instrument. The pre- and post-tests were called pre- and post-survey instruments. One person graded both the pre- and post-surveys. The surveys were graded in the same way, regardless of pre- or post- placement. The surveys were graded with a liberal interpretation of what was right. Specific words or answers were not counted as the only possible "right" answers. In ideal situations, the pre-survey instrument should be given at least two weeks prior to the class, both to prevent pre-test bias to learning and to evaluate the pre-knowledge of the physicians involved and adjust the curriculum to the physicians' specific needs.**

Descriptive statistics (means, standard deviations, range, skewness, and kurtosis) for the pre-test, post-test, and both tests combined, are presented in Appendix E. A more complete report of pre- and post-test descriptive statistics, including the mean of the correct and incorrect answers for both tests, as well as the range, mean, and mode for both tests, are presented at Appendix F. Based on these statistics, none of the distributions appeared to depart markedly from a normal distribution. Univariate frequency distributions were examined for each test to identify possible outliers. No adjustment was necessary to correct for outliers.

To investigate the number of people getting correct and incorrect answers to each question, the frequency distributions at Appendixes G and H were assembled. Further frequency distributions by score (numbers of correct answers) for each test are placed at Appendixes I and J. All of the frequency distributors were used to create a frequency distribution that indicates the number of people who changed from an incorrect answer on the pre-test to a correct answer on the post-test, by question number. All of the descriptive statistics were then used to evaluate the curriculum and the survey instrument and make changes as indicated by the results.

**CHAPTER IV**

**Discussion**

Based on the descriptive statistics presented in the Results section and discussions with physicians and nurses at Irwin Army Community Hospital, the curriculum and the survey instrument were revised. The change in means from the pre-test to the post-test indicated that as a whole the physicians at this facility did not initially know very much about WMSN, but that, after being taught, their knowledge base changed. No test was used to see if the change from a mean of 3.83 on the pre-test to a mean of 10.91 on the post-test was significant in a statistical sense, because the only real test of significance of change in this case is if the physicians' practice patterns change to use nursing resources more effectively, and that is outside the scope of this project. However, during post-instruction discussions with nurses in this facility, there seem to be some indicators of physician interest change. Some nurses report that their physicians have been asking questions about the system and wanted to see the WMSN reports on patients and on the ward. This had never happened before, and may or may not be the result of the instruction on WMSN, but it is nonetheless seen as a healthy communication trend.

A mean change that was also investigated was the change in means for *correct* and *incorrect* answers. The means of correct and incorrect answers almost totally reversed themselves from the pre-test to the post-test. This was further construed to establish that the curriculum, although needing some revision, was basically sound and did not need major revision.

The survey instrument was changed based mainly on discussions with test takers after completion of the instruction process and the post-test. These discussions revealed that some of the questions did not convey to physicians what was intended, so the questions were revised and rediscussed with all physicians surveyed. Final adjustments were then made to the survey instrument.

The frequency distribution system of displaying correct and incorrect answers to the survey instrument for both tests was used to indicate areas to be changed. Of particular use was the distribution of change in answers from the pre-test to the post-test. The survey questions that showed the least change from an incorrect answer on the pre-test to a correct answer on the post-test were questions six and seven. Further investigation using the frequency distribution by test question shows that question number six changed very little from pre- to post-test, because 15 of the 23 people surveyed got a correct

answer on the pre-test. The curriculum was adjusted downward on emphasis about why we need a nursing workload management system, because the physicians here already seem to have a grasp of this information. Investigation into the lack of change in question 14 revealed the most serious deficiency in the curriculum. The pre-test indicated that 91 percent of the people did not know the information required for a correct answer, and furthermore, that even after getting instruction, 74 percent still did not get the correct answer. The concept of WMSN figures being an *average* was not sufficiently emphasized in the curriculum. Question 14--even with changes to the curriculum to show this concept more directly (by filling out the actual acuity forms), and a direct statement about averages being the base of the system--will probably still be a discriminator of understanding. The curriculum and the survey instrument were also changed based on receipt of over 50 percent correct answers on the pre-test and over 50 percent incorrect answers on the post-test.

A follow-on study to indicate the need for this kind of program at other DOD facilities may reveal the need for either individual curriculums at each facility based on the knowledge of the physicians, or a central program taught at a site such as the Academy of Health Sciences, Fort Sam Houston. An even further follow-on cost benefit

analysis of a centralized-versus-*decentralized* system may be indicated if the first study reveals a DOD-wide need for a WMSN curriculum for physicians.

**CHAPTER V**

**Conclusions and Recommendations**

**This project has resulted in the creation of a curriculum for physicians about the Workload Management System for Nurses. A survey instrument has been created as a built-in evaluation system to assist in changing the curriculum as physician needs change.**

**Based on the results of the study and discussions with physicians and nurses at Irwin Army Community Hospital about the study, it is the recommendation of this researcher that the curriculum be taught to new or incoming physicians who do not score at least 75 percent on the survey instrument, and to all others who wish to learn more about the system. Two hours appears to be enough time to teach the material, and the material (as presently revised) seems to meet the present skill level of the physicians at Irwin Army Community Hospital.**

**A further recommendation is that all medical facilities using WMSN evaluate the degree of knowledge of their physicians about the WMSN. It is clear that very few physicians at Irwin Army Community Hospital know anything at all about the system that determines nursing resources and that is impacted heavily by their practice patterns. If this situation is similar at other military medical**

facilities, then the curriculum presented by this project needs to be revised based on physician needs within the facility and taught accordingly.

If nursing resources are to be used in the most effective manner, physicians must understand and appreciate the importance of their practice patterns on cost in terms of nursing workload requirements. Training/education for physicians regarding their impact on nursing workload must be either provided from some outside source or taught at the facility. If effective exchange of information regarding practice patterns between nurses and physicians does not occur at each facility as a part of the natural communication process, then it must be institutionalized as part of the education/training system at each facility or as a part of a central curriculum at the Academy of Health Sciences.

CHAPTER VI

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**Appendix A**

**DEFINITIONS**

1. *Workload Management System for Nurses (WMSN)* (pronounced "Wims"):

A patient classification instrument which requires a registered nurse to assess ten groups of factors related to direct patient care and assign an overall score to each factor. This assessment is used to predict care requirements for a 24-hour period. The scores are weighted and summed to classify each patient into one of seven categories (0-6). Indirect care time is already calculated into the methodology. The WMSN staffing methodology is used to determine nursing care requirements as well as the mix of personnel required for quality care.

2. *Classification:*

A means of grouping, ordering, or arranging objects or concepts into sets, based on the relationships among the objects or concepts.

3. *Inpatient classification:*

Refers to the different methods and procedures used to group patients according to their requirements.

**4. *Acuity system:***

A tool that provides data based on the severity of illness of the patient.

**5. *Prototype classification system:***

Broad descriptions of characteristics for a patient, to determine their category.

**6. *Factor evaluation classification system:***

A process in which separately rated critical indicators are numerically combined to place the patient in a category.

**7. *Direct nursing care time:***

Time required for activities taking place in the presence of the patient and/or the patient's family.

**8. *Indirect nursing care time:***

Time required for activities performed away from the patient and/or the patient's family.

**9. *Nursing care hour requirement:***

Number of hours of nursing time required to provide quality care.

This is determined using pre-calculated patient care hour requirement charts in the following clinical areas:

Medical/Surgical, Pediatric, Critical Care, Psychiatric, OB/GYN, and Nursery.

**Appendix B**

**SURVEY INSTRUMENT**

- 1. What role do physicians play in the Workload Management System for Nursing (WMSN)?**
  
- 2. Do your orders raise and/or lower patient "acuity levels" as defined by the WMSN?**
  
- 3. According to WMSN, which category of patient requires a one-staff-to-one-patient ratio?**
  
- 4. Describe one way the WMSN affects the quality of health care.**
  
- 5. Is the WMSN used at Irwin Army Community Hospital?**
  
- 6. Name one reason why we need a nursing workload management system.**
  
- 7. Name one way we know that the WMSN is reliable, valid and quantifiable.**

8. **Is the WMSN research-based?**
  
9. **Name one agency that *requires* the WMSN.**
  
10. **What categories of patients would necessitate coordination with the ward nurse before placement in the ward?**
  
11. **Name a WMSN measurable aspect of care that is ordered entirely by the physician.**
  
12. **Name a WMSN measurable aspect of care that is ordered entirely by the nurse.**
  
13. **What information is provided by ward Nursing Care Hours?**
  
14. **Is the staffing recommended by WMSN inflated, optimal, maximum, average, or minimum needed?**
  
15. **Are WMSN standards developed for all areas in the hospital nursing environment?**

**Answer Key to Survey Instrument**

1. Physicians' orders drive 6 of the 10 factors in evaluating patient "acuity." Physicians admit/transfer/and discharge patients taking into account nursing care hour requirements.
2. Yes, they both raise and lower patient "acuity levels."
3. Category 5.
4. Justifies increased staffing needed to provide the right numbers and mix of staff to care for patient's requirements.
5. Yes, all DOD hospitals use WMSN.
6. JCAHO requirements and staffing requirements.
7. Inter-rater reliability is done regularly.
8. Yes.

9. JCAHO and DOD.
10. All patients, especially Categories 4-6.
11. Vital signs, monitoring, IV therapy, treatments/procedures/medications, and respiratory therapy.
12. Teaching, emotional support, and most of activities of daily living.
13. Hours of nursing care required and the staffing needed to accomplish the requirements.
14. Average.
15. No, standards are not available for the emergency room, labor and delivery, recovery, and outpatient clinics.

**APPENDIC C**

**Revised Curriculum**

**With Overheads and Handouts**

**The**

**WORKLOAD MANAGEMENT SYSTEM FOR NURSING**

**(WMSN) or (WMS)**

**Pronounced "WIMS"**

**Learning Objectives**

1. **Feel an urgency to understand my impact on WMSN and WMSN's impact on me as a physician.**
2. **Be able to describe WMSN briefly to someone else.**
3. **Know that WMSN is mandated by the provisions of JCAHO.**
4. **Have some familiarity with the creation of the WMSN system.**
5. **Incorporate this new knowledge about WMSN into my practice pattern as a physician.**

**Teaching Objectives**

1. Prepare convincing arguments concerning why physicians need to know about WMSN.
2. Provide a short description of WMSN.
3. Tell who requires the system.
4. Outline the history of WMSN.
5. Show how WMSN works, using the data sheets.
6. Tell what WMSN is used for and what it *could* be used for.

**Agenda**

(A two-part class to physicians, consisting of three hours, with a break in between)

1. Why do you need to know about WMSN?
2. What is WMSN?
3. What mandates the system?
4. What is the history of WMSN?
5. How does WMSN work?
6. What is WMSN used for?
7. What *could* WMSN be used for?

Teaching Script

Overhead

[1] Title Slide

[2] A. What are we going to talk about, and how will the program be broken up?

[3a] B. Why do physicians need to know about the WMSN?

[3b]

1. Some people don't want you to know, for fear that you will manipulate the system to get what you want. Others do want you to know and want to foster partnership, not warfare. (Example: Some insurance agencies use medigroups, and the information they derive they will not share with the doctors.)
2. Physicians' orders drive over half of the ten factors in evaluating patient acuity levels.
3. It is a reliable, prospective indicator to physicians of when nursing does not have the resources to provide the amount and/or kinds of nursing care required. Also, it is an indicator of cost efficiency or inefficiency of the physician's practice pattern.
4. It is the staffing standard used by the U.S. Army Manpower Authorizations and Documentation Agency (USAMARDA) now integrated with the U.S. Army Force Integration Support Agency (USAAFISA).
5. When there are not enough nurses, physicians' workload increases.
6. When there are not enough nursing personnel, interesting cases are lost through CHAMPUS.
7. Quality of care diminishes when nursing personnel are not available. Physicians get blamed for lack of quality care, even though they are an *episodic presence* in the life of the patient, with the nursing staff providing the *continuity of care*. A study indicates that "infection rates occurred more often on the short-staffed unit" (Flood & Diers, 1988, p. 42).

8. Residency programs are threatened if there are not adequate numbers of nursing support staff.
9. Patient classification systems that do not make clinical sense to the physician do not provide value to the institution (Rosko, 1988, p. 262). The value of WMSN is lessened if physicians don't buy into it.
10. In some military hospitals, admissions are limited based on WMSN statistics.

C. What is WMSN?

- [4] It is a two-part inpatient acuity classification system that first assesses patients using 10 groups of factors and, based on that assessment, assigns patients to one of 7 categories.
- [5] Secondly, WMSN links the acuities with a staffing methodology for required nursing staff.

The patient classification system that physicians are the most aware of is the *Diagnosis Related Group* system (DRG). DRGs are based on diagnosis alone and do not take into account patient acuity. WMSN, on the other hand, does not involve diagnosis at all, but is based on what Horn in 1986 called the "quantification of a patient's total burden of illness."

Presently, nursing researchers are attempting to combine the DRG and WMSN systems.

D. What mandates the system?

- [6] The Joint Commission on Accreditation of Health Care Organizations (JCAHO) mandates that: "The nursing department/service defines, implements, and maintains a system for determining patient requirements for nursing care on the basis of demonstrated patient needs, appropriate nursing intervention, and priority for care." It further mandates that "the hospital admissions system must allow for participation from the nursing department and/or service in coordinating patient requirements for nursing care with available nursing resources."
- [7a-e] There seems to be a basic need for some system to describe severity/acuity. We have problems defining severity.

[8a-d] Many people have tried to describe or define *severity of illness*. The first group of overheads show five different severity systems now being used. The second set of overheads shows some of these systems in more detail.

[9a-b]

E. History of WMSN.

1. In the past, nurse staffing was based on occupied bed days.
- [10] 2. In the 1950s, the U.S. Army instituted a four-category patient classification system. Staffing was still based on occupied bed days, but some attention was given to the four categories: Intensive Nursing Care (Cat I), Moderate Nursing Care (Cat II), Minimal Nursing Care (Cat III), and Self Care (Cat IV).
- [11] 3. WMSN is based on three studies conducted from 1981-1984.
  - a. *U.S. Army Nursing Care Hours Standards Study*, Sherrod, Rauch, and Twist, 1981.
  - b. *Indirect Nursing Care Time*, Misener, Frelin, and Twist, 1983.
  - c. *Workload Management & System for Nursing (WMSN)*, Vail, Norton, and Rimm, 1984.

The nursing care hours study involved 37,000 time measurements to establish mean times for direct nursing care activities. This study was later validated by the consulting firm Health Management Systems Associates.

The second study used objective criteria to measure the percentage of indirect care time and the amount of unavailable time.

In January 1982, the chief of the Army Nurse Corps directed the development of a single system of patient classification.

From 1982 through 1985, the Army/Navy nurse researchers joined forces to develop the WMSN to meet their patient classification needs.

[12]

4. In 1985, the WMSN was tested at five sites and implemented. The primary function of this system was to provide management information to all levels of nursing management for effective allocation and utilization of nursing personnel.
5. In December 1986, WMSN was incorporated into an Army manpower staffing standard, MS-III.
6. In September 1987, WMSN was accepted as a Joint Healthcare Manpower Standard for inpatient nursing units.
7. In 1988, the automation of WMSN was completed, using the Uniformed Chart of Accounts Personnel Utilization System (UCAPERS) and Zenith PCs.

F. How does WMSN work?

(Hand out patient acuity data sheets.)

[13-14]

1. The process begins with classification of patients by an ANC/RN into categories, using the patient acuity worksheets. In the general sheet there are 10 factors and in the psychiatric worksheet there are 9 factors.

(Show overheads.)

[14a-0] (Explain how sheets are filled out.)

A factor is simply an item on the patient acuity sheet that reflects a need for nursing care. Sometimes people call some of the factors *critical indicators*. A critical indicator is a factor that has the greatest impact on direct care time.

[15-16]

(Hand out patient acuity sheets 15 & 16.  
Show slides 16a-i. Explain how sheets differ from the general ones.)

[16a-i]

The data used to fill out the acuity sheets comes from:

[17]

- a) Physician orders/medical care plans
- b) Nurses orders/nursing care plans

- c) Hospital/unit standards of care or SOPs
- d) Prediction by the RN of care required over a 24-hour period

Just looking at the factors on the acuity sheet tells any physician that he/she has a major impact. At least six of the eight critical indicators are driven by the physician's ordering plan. In addition to having a major role in the final classification of the patients, the physician also admits, transfers, and discharges the patient, hopefully taking into account the nursing care hour requirements associated with each patient. A physician's orders can directly affect the raising or lowering of the patient's *acuity levels*.

I have seen physicians who, in an attempt to lower acuity levels, "DC emotional support." This does not work, because teaching and emotional support are two of the factors that are driven not by physicians, but by nurses, as is most of the factor "activities of daily living." Physicians control most of the other factors--vital signs; monitoring; IV therapy; treatments, procedures, medications, and respiratory therapy. Each point on the acuity sheet is equal to 7.5 minutes of direct nursing care time.

[18]

*Direct care time* is defined as the "time required for activities taking place in the presence of the patient and/or family." Indirect nursing care time is built into the methodology and can be considerable. *Indirect nursing care time* is defined as "time required for activities and tasks performed away from the patient and/or family."

[19] (The percentages show how much indirect care time is needed in the different specialty areas.)

[20] It includes such things as charting, phone coordination, cleaning, admissions, care conferences, personal time and staff education. In addition to the other factors involved, 290 hours or full time administration is allotted to head nurses and wardmasters in CONUS.

[21]

[22]

- [23] There are some special considerations on points given to *inpatient* wards that care for *outpatients* or do after-hours recovery or one-day surgeries. Once the total points for a patient are added, you look to section II of the acuity sheet to get the category of the patient.
- [24] There are seven categories. Category O is a patient on pass who is gone the entire 24 hours. You can see that once a patient reaches a Category IV, coordination with the nursing staff becomes even more necessary. A Category V patient requires one-to-one nurse/patient time, and Category VI patients need continued care plus another staff member as well.
- [25] Once you know the categories of all your patients in the specific areas, you accumulate the categories and determine according to specialty in the seven clinical areas the nursing care hour requirement.
- [26] The nursing care hours are then added and the personnel requirements are gotten from the daily personnel requirements chart.
- [27] Nursing care hour requirements tell you how many hours on the average of nursing care are required, and how many staff of what mix are needed. The staffing recommended in this method is an average.
- [28] In order to keep the validity of the WMSN high, Interrater Reliability Testing is done. An IRR of 85% is the present accepted standard of adequacy.
- [29] 2. Standards for workload do not presently exist for the ER, L&D, post-anesthesia, and outpatient care.
- [30] 3. The entire system was worked over by both inhouse and outhouse statisticians and found to be highly valid and reliable. The system is obviously quantifiable.
- [31, 32, 33, 34, 35] 4. Here are some of the WMSN reports that are used in various military hospitals.

[36]

G. The automated WMSN is used at Irwin Army Community Hospital. It is used at all DOD hospitals and in some civilian facilities. Its present uses include distribution of workload, improving personnel utilization, and assessing nursing quality assurance.

[37]

H. What is the future of WMSN?

The last potential use is probably the most interesting to physicians. Various civilian agencies across the nation, including industry, insurance companies and hospitals, are now using some sort of severity index to severity-adjust for case mix and in an attempt to change physicians' clinical practice patterns.

[38-39-40]

Data is available to payors of health care, such as the data on the handouts. This data is being used to examine and compare cost physicians.

[41-42-43-44]

Third-party payors are seeking what they are calling the most efficient provider.

[45]

This provider is defined as the provider that can give maximum quality at maximum cost efficiency. Payors are maintaining

[46]

that cost control is 70 to 80 percent under the control of the physician. They assert that resources are largely allocated by the physician, and that there are large variations in cost, depending on the physician's practice patterns. Claims are made that the

[47]

largest tendency to overuse resources occurs the most often at the lower acuity levels, rather than the higher levels.

(Source lecture by Dr. Mohlenbrock (Iameter, Inc.)

I. Conclusion.

The Workload Management System for Nursing (WMSN) is largely driven by your ordering pen. *You affect the use of resources and the provision of those resources. If the military ever decides to use the WMSN to severity adjust your cases--as the civilian world is beginning to do--then the WMSN could potentially affect you as much as you affect it.*

THE WORKLOAD MANAGEMENT  
SYSTEM FOR  
NURSES

(WMSN) OR (WMS)

"Pronounced WIMS"

# AGENDA

(HORELL)

1. Why do physicians need to know about WMSN?
2. What is the WMSN?
3. What mandates the system?
4. History of WMSN
5. How does WMSN work?
6. What is it used for?
7. What could it be used for?

## WHY?

- Why do physicians need to know about the WMSN?
- 1. Some people don't want you to know.
- 2. Physician's orders drive over half of the ten factors in evaluating patient acuity levels.
- 3. It is a reliable prospective indicator to physicians.
- 4. It is the staffing standard used.
- 5. When there are not enough nurses, physicians' work load increases.

## WHY?

- Why do physicians need to know about the WMSN?
- 6. When there are not enough nursing personnel, interesting cases are lost through CHAMPUS.
- 7. Quality of care diminishes when nursing personnel are not available.
- 8. Residency programs are threatened if there are not adequate numbers of nursing support staff.
- 9. Patient classification systems that do not make clinical sense to the physician do not provide value to the institution.
- 10. In some military hospitals admissions are limited based on WMSN statistics.

# WMSN

- A PATIENT CLASSIFICATION SYSTEM
- MEASURES ACUITY OF EACH PATIENT
- LINKS ACUITY TO A STAFFING  
METHODOLOGY
- PRESCRIBES NUMBER AND MIX OF  
STAFF BY SKILL LEVEL

# TWO PART SYSTEM

DETERMINES ACUITY OF ILLNESS

LINKS ACUITY TO A STAFFING METHODOLOGY

CONCURRENT AND PROSPECTIVE

MEASURES DIRECT AND INDIRECT

NURSING CARE

# ACCREDITATION MANUAL FOR HOSPITALS

•NR.4.4 The nursing department/service defines, implements, and maintains a system for determining patient requirements for nursing care on the basis of demonstrated patient needs, appropriate nursing intervention, and priority for care.

•NR.4.4.2 The hospital admissions system allows for participation from the nursing department/service in coordinating patient requirements for nursing care with available nursing resources.

# SUMMARY DESCRIPTION OF SEVERITY MEASURES

SEVERITY MEASURE	APACHE II
DATA REQUIREMENTS	Chart Review
DEFINITION OF SEVERITY	Risk of Imminent Death
DIAGNOSIS USED	No
CLASSIFICATION SYSTEM	Score from 1-71 indicating overall patient severity

# SUMMARY DESCRIPTION OF SEVERITY MEASURES

SEVERITY MEASURE	Computerized Severity Index
DATA REQUIREMENTS	Chart Review
DEFINITION OF SEVERITY	Treatment Difficulty presented to physicians
DIAGNOSIS USED	Yes
CLASSIFICATION SYSTEM	Score from 1-4 for patient overall and for each ICD-9-CM diagnostic code

# SUMMARY DESCRIPTION OF SEVERITY MEASURES

SEVERITY MEASURE	Disease Staging Q-Scale
DATA REQUIREMENTS	Discharge Abstract
DEFINITION OF SEVERITY	Resource Needs
DIAGNOSIS USED	No
CLASSIFICATION SYSTEM	Percentage compared with an average of 100 indicating overall patient severity

# SUMMARY DESCRIPTION OF SEVERITY MEASURES

SEVERITY MEASURE MedisGroups

DATA REQUIREMENTS Chart Review

DEFINITION OF SEVERITY Risk of Imminent Organ failure

DIAGNOSIS USED No

CLASSIFICATION SYSTEM Score from 0-4 on admission and morbidity score at mid-stay review indicating over-all severity

# SUMMARY DESCRIPTION OF SEVERITY MEASURES

SEVERITY MEASURE      Patient Management Categories

DATA REQUIREMENTS      Discharge Abstract

DEFINITION OF SEVERITY      Resource Needs

DIAGNOSIS USED      Yes

CLASSIFICATION SYSTEM      Cost-based relative weight  
compared with an average of  
1.0; also classifies based  
on major surgery

# COMPUTERIZED SEVERITY INDEX

Developed by Susan D. Horn of Q.C. Inc.  
and Health Systems International

4	Vomiting Blood	Abdominal Rigidity
3	Abdominal Guarding	Persistent Vomiting
2	Vomiting	High Pulse
1	Nausea	Normal Pulse
0		

## ULCERS

Source: Health Week, March 26, 1990

# COMPUTERIZED SEVERITY INDEX

Source: HealthWeek, March 26, 1990

4	Fever Greater than 104	No Breathing
3	Fever 102.1 to 103.9	Coma
2	Fever 1005. to 102	Shortness of Breath at Rest Acute Confusion
1		Shortness of Breath on Exertion Chronic Confusion
0	Fever less than 100.4 or chills	

## PNEUMONIA

# COMPUTERIZED SEVERITY INDEX

Source: Health Week, March 26, 1990

4	No Breathing	Total Body Swelling
3	Shortness of Breath at Rest	Severe Swelling
2	Shortness of Breath on Exertion	Moderate Swelling
1	Minor Shortness of Breath	Mild Swelling of Limbs
0		Normal Pulse

Very High Pulse  
(Greater than 130)

High Pulse

## HEART FAILURE

# COMPUTERIZED SEVERITY INDEX

Source: Health Week, March 26, 1990

4	Coma Grand mal seizures	Total body swelling
3	Acute confusion Severe swelling	Blood pressure 220/110
2	Chronic confusion	Moderate swelling
1	Tremors Mild swelling of limbs	Normal blood pressure
0		

RENAL FAILURE

# AUTHORS

Source: Journal of ACE Vol 35, #2, p. 223

<u>AUTHOR</u>	<u>DEFINITION OF SEVERITY</u>
Brewster et al. (1985)	"potential for organ failure"
Coffey and Goldfarb (1986)	"disease progression toward death (or physical impairment, if death is an unlikely outcome for a specific disease"
Gonnella, Hornbrook, and Horn (1986)	"risk of death or temporary or permanent impairment"
Horn (1986)	"quantification of patient's total burden of illness"
Knaus et al. (1981)	"probability of mortality"

## AUTHORS

### AUTHOR

Kreitzer, Liebner, and  
Roveti (1982)

### DEFINITION OF SEVERE

"degree and impact of change  
on the health status of an  
individual as a result of  
illness or injury"

Schweiker (1982)

"risk of immediate death or  
permanent loss of function"

Smits, Fetter, and McMahon  
(1984)

"impact of the particular  
disease process on patient's  
physiologic integrity"

# 1950's US ARMY

## 4-Category Patient Classification

CAT I INTENSIVE NURSING CARE

CAT II MODERATE NURSING CARE

CAT III MINIMAL NURSING CARE

CAT IV SELF CARE

## WMSN IS BASED ON 3 STUDIES

- a. U.S. Army Nursing Care Hours Standards Study,  
Sherrod, Rauch, and Twist, 1981
- b. Indirect Nursing Care Time,  
Misner, Frelin, and Twist, 1983
- c. Workload Management and System for Nursing (WMSN)  
Vail, Nortonn and Rimm, 1984

# WMSN FIELD TESTED AT FIVE MTF'S

- WALTER REED ARMY MEDICAL CENTER
- DWIGHT D. EISENHOWER ARMY MEDICAL CENTER
- KIMBROUGH USA COMMUNITY HOSPITAL
- IRELAND USA COMMUNITY HOSPITAL
- WOMACK USA COMMUNITY HOSPITAL

# PATIENT ACUITY SHEET (GENERAL)

Enter Date, RN Initials,  
and Last four S.S.N ----->

ACUITY CODE	SECTION 1 - CRITICAL INDICATORS	POINT VALUES
1	Vital signs (Manual IPR, BP)	1
2	Vital signs qid or less	2
3	q4h or x 6	3
4	q3h or x 8	4
5	q2h or x 12	5
6	q1h or x 24	6
7	Rectal or axillary temp or apical pulse qid or more	2
8	Femoral, pedal or popliteal pulse or FHT qid or more	2
9	Tilt test q4h or more	2
10	Post-CP, post-partum, or post delivery (newborn vs)	6
<b>MONITORING</b>		
10	Intake and output q4h	2
11	q2h	8
12	Circulation or fundus checks q2h or x 12	2
13	Neuro checks q4h or x 6	3
14	q2h or x 12	6
15	CVP or ICP (manual) q2h or x 12	2
16	Cardiac/SpO2/Temp/BP monitor (not cumulative)	6
17	Transcutaneous monitor/Oximeter	6
18	A-line or ICP monitor or Swan Ganz set-up	4
19	A-line or ICP monitor reading q2h or x 12	2
20	Swan Ganz: PAC/PA wedge reading q4h or x 6	2
21	q2h or x 12	4
22	Cardiac output tid or x 3	2
<b>ACTIVITIES OF DAILY LIVING</b>		
23	Care - age 5 or less - (Infant/toddler)	6
24	Care - age 6 or more - Self/Minimal	2
25	- Assisted	6
26	- Complete	14
27	- Total	32
28	Extra linen change & partial bath x 2 per shift	4
29	Turning frame - 2 staff members - q2h	14
30	Peds recreation/observation - age 0-12	8
<b>FEEDING</b>		
31	Spoon feed meals - age 6 or more - x 3	6
32	- age 5 or less - x 3	10
33	Infant/Neonate bottle x 1 feeding	2
34	q4h or x 6	12
35	q3h or x 8	16
36	Tube feed bolus q4h or x 6	5
37	q3h or x 8	8
38	q2h or x 12	10
39	Tube feed-Adult/child/Neonate-continuous q bag change	2
	<b>SUBTOTAL A POINT VALUE</b>	

ACUITY CODE	SECTION 1 - CRITICAL INDICATORS (continued)	POINT VALUES
<b>IV THERAPY</b>		
40	Start IV	2
41	Change bottle/bag/volutrol bid or less	4
42	tid or qid	6
43	x 5 or more	8
44	Heparin lock or Broviac q4h or x 6	4
45	IV medication q4h or x 3	2
46	q4h or x 4	3
47	q4h or x 6	4
48	Blood products per unit	2
49	Infusion controller/pump (each)	2
<b>TREATMENTS/PROCEDURES/MEDICATIONS</b>		
50	Insert NG	2
51	Pre-op prep/enema/Ace wraps/support hose	2
52	Catheterization - Foley/straight	2
53	Tube care (Exclude Trach) x 2	2
54	Breasing - simple 5 - 7 mins x 2	2
55	- complex 30 mins x 1	4
56	Lab Tests performed/collected on the unit x 3	2
57	Do EKG	2
58	Venipuncture, arterial puncture x 2	2
59	Medications - exclude IV- 3-11 trips q3h - q4h	2
60	Medications - exclude IV- 12 trips or more q2h	4
61	Irrigations or instillations x 4 or less	2
62	Restraints, 2 point, 4 point, Posey	2
63	Assist OOB chair/gurney & return x 3	2
64	Assist to ambulate & return x 1	2
65	Infant circumcision or phototherapy	2
66	Isolation mask, gown and gloves x 8	2
67	Chest tube insertion or lumbar puncture (assist)	4
68	Thoracentesis or paracentesis (assist)	4
69	Range of motion exercises x 3	4
70	New admission - assessment and orientation	12
71	Transfer - in-house (receiving unit only)	4
72	Accompany patient off unit 15 minutes	2
73	30 minutes	4
74	45 minutes	6
75	Other activities requiring 15 minutes	2
76	requiring 30 minutes	4
77	requiring 45 minutes	6
78	Each hour requiring continuous staff attendance (continued on other side)	8
	<b>SUBTOTAL B POINT VALUE</b>	

**PATIENT ACUITY SHEET (GENERAL)**

COMMENTS

Enter Date, RN Initials, and Last four S.S.M. ---->

ACUITY CODE	SECTION 1 - CRITICAL INDICATORS (continued)	POINT VALUES
79	RESPIRATORY THERAPY	2
80	Oxygen therapy or oxyhood	2
81	Incentive spirometer or C & DB q4h or x 6	2
82	IPPB or Maxmist bid or x 2	4
	q6h or x 4	6
83	q4h or x 6	8
84	Croup tent or mist tent	2
85	Chest pulmonary therapy bid or x 2	4
86	q6h or x 4	6
87	q4h or x 6	2
88	Suctioning q4h or x 6	4
89	q2h or x 12	10
90	Ventilator	4
91	Tracheostomy care x 3	4
<b>TEACHING</b>		
92	teaching - group - per hour	2
93	- individual - per 30 minutes	4
<b>EMOTIONAL SUPPORT</b>		
94	Patient/family support per 30 minutes	4
95	Lifestyle modification per 30 minutes	4
96	Sensory deprivation - blind, deaf, retarded, etc.	6
97	Maximum points for emotional support	10
<b>CONTINUOUS</b>		
98	Patient requiring 1:1 coverage all shifts	96
99	Patient requiring > 1:1 coverage all shifts	146
SUBTOTAL A POINT VALUE		
SUBTOTAL B POINT VALUE		
TOTAL POINT VALUE		
CATEGORY		

TYPE OF PATIENT
Med/Surg
ICU
NICU
Nursery
Antepartum/Postpartum
Pediatric
Psychiatric

Check the appropriate box.

**SECTION II - ADDITIONAL DATA ACUITY TABLE**

Category 0-	0 points
Category 1-	1- 12 points
Category 11-	13- 31 points
Category 111-	32- 63 points
Category 1V-	64- 95 points
Category V-	96-145 points
Category VI-	146-262 points

# SECTION 1 - CRITICAL INDICATORS

## VITAL SIGNS (Manual, TPR, BP)

Addressograph		SECTION 1 - CRITICAL INDICATORS	POINT VALUES
ACUITY CODE	Enter Date RN Initials and Last Four S.S.N. ---->		
		VITAL SIGNS (Manual TPR, BP)	
1		Vital signs qid or less	1
2		q4h or x 6	2
3		q3h or x 8	3
4		q2h or x 12	4
5		q1h or x 24	8
6		Rectal or acillary temp or apical pulse qid or more	2
7		Femoral, pedal or popliteal pulse or FHT qid or more	2
8		Tilt test q4h or more	2
9		Post-op, post-partum, or post delivery (infants)	6

## SECTION 1 - CRITICAL INDICATORS

### MONITORING

	MONITORING								
10	Intake and output q8h	2							
11	q2h	8							
12	Circulation or fundus checks q2h or x 12	2							
13	Neuro checks q4h or x 6	3							
14	q2h or x 12	6							
15	CVP or ICP (manual) q2h or x 12	2							
16	Cardiac/apnea/temp/BP monitor (not cumulative)	6							
17	Transcutaneous monitor / oximeter	6							
18	A-line or ICP monitor or Swan Ganz set-up	4							
19	A-line or ICP monitor reading q2h or x 12	2							
20	Swan Ganz PA?/PA wedge reading q4h or x 6	2							
21	q2h or x 12	4							
22	Cardiac output tid or x 3	2							

# SECTION 1 - CRITICAL INDICATORS

## ACTIVITIES OF DAILY LIVING

	ACTIVITIES OF DAILY LIVING								
23	Care - age 5 or less - (infant / toddler)	6							
24	Care - age 6 or more - Self / Mirimal	2							
25	- Assisted	6							
26	- Complete	14							
27	- Total	32							
28	Extra linen change & partial bath x 2 per shift	4							
29	Turning frame - 2 staff members - q2h	14							
30	Peds recreation / observation - age 0 - 12	8							

ACTIVITIES OF DAILY LIVING

	Meds	Assess	Questions	Meal Tray	Bed Linen	Bath	Wt	Bed Pan	Turn	Skin Care
SELF	X	X	X	X	unocc	supply equip/ independ	-	-	-	-
ASSISTED	X	X	X	X	unocc	help : bed/tub shower	amb	-	-	-
COMPLETE	X	X	X	X	occ	bathe	bed/ amb	X	help	-
TOTAL	X	X	X		occ	bathe oral q4	bed	X	q2	q2
PEDS	X	X	X	X	X	bathe dress prn	X	BR dia- pers	-	-

EXTRA LINEN - partial bath and linen change x 2 per shift

incontinent or diaphoretic patients

diapered adults

# SECTION 1 - CRITICAL INDICATORS

## FEEDING

	FEEDING						
31	Spoon feed meals - age 6 or more - x 3	6					
32	- age 5 or less 0 x 3	10					
33	Infant / neonate bottle x 1 feeding	2					
34	q4h or x6	12					
35	q3h or x 8	16					
36	Tube feed bolus q4h or x 6	5					
37	q3h or x 8	8					
38	q2h or x 12	10					
39	Tube feed - Adult / child / neonate (continuous)	2					
////	////SUBTOTAL A POINT VALUE	////					

# SECTION 1 - CRITICAL INDICATORS

## IV THERAPY

	IV THERAPY							
40	Start IV	2						
41	Change bottle / bag / volutrol bid or less	4						
42	tid or qid	6						
43	x 5 or more	8						
44	Heparin lock or Broviac q4h or x 6	4						
45	IV medication q8h or x 3	2						
46	q6h or x 4	3						
47	q4h or x 6	4						
48	Blood products per unit	2						
49	Infusion controller / pump (each)	2						

# SECTION 1 - CRITICAL INDICATORS

## TREATMENTS / PROCEDURES / MEDICATIONS

	TREATMENTS / PROCEDURES / MEDICATIONS							
50	Insert NG	2						
51	Pre-op prep / enema / Ace wraps / support hose	2						
52	Cateterization - Foley / straight	2						
53	Tube care (exclude Trach) x 2	2						
54	Dressing - simple 5 - 7 mins x 2	2						
55	- Complex 30 mins x 1	4						
56	Lab Tests performed / collected on the unit x 3	2						

# SECTION 1 - CRITICAL INDICATORS

## TREATMENT / PROCEDURES / MEDICATIONS (CONT'D)

	TREATMENTS / PROCEDURES / TREATMENTS								
57	Do EKG	2							
58	Ventipuncture , arterial puncture x 2	2							
59	Medications - exclude IV - 3 - 11 trips q3h-q8h	2							
60	Medications - exclude IV - 12 trips or more q2h	4							
61	Irrigations or Installations x 4 or less	2							
62	Restraints, 2 point, 4 point, posey	2							
63	Assist 00b chair / gurney & return x 3	2							
64	Assist to ambulance & return x 1	2							

# SECTION 1 - CRITICAL INDICATORS

## TREATMENT / PROCEDURES / MEDICATIONS (CONT'D)

	TREATMENTS / PROCEDURES / TREATMENTS							
65	Infant circumcision or phototherapy	2						
66	Isolation mask, gown and gloves x 8	2						
67	Chest tube insertion or lumbar puncture (assist)	4						
68	Thoracentesis or paracentesis (assist)	4						
69	Range of motion exercises x 3	4						
70	New admission - assessment and orientation	12						
71	Transfer - in-house (receiving unit only)	4						

# SECTION 1 - CRITICAL INDICATORS

## TREATMENT / PROCEDURES / MEDICATIONS (CONT'D)

	TREATMENTS / PROCEDURES / TREATMENTS								
72	Accompany patient off unit 15 minutes	2							
73	30 minutes	4							
74	45 minutes	6							
75	Other activities requiring 15 minutes	2							
76	requiring 30 minutes	4							
77	requiring 45 minutes	6							
78	Each hour requiring continuous staff attention	8							
///////	(cont on other side) SUBTOTAL B POINT VALUE	///////							

# SECTION 1 - CRITICAL INDICATORS

## RESPIRATORY THERAPY

Enter Date RN Initialsand Last FourS.N. - - - - ->		POINT VALUES
ACUITY CODE	SECTION 1 - CRITICAL INDICATORS RESPIRATORY THERAPY	
79	Oxygen therapy or oxyhood	2
80	Incentive spirometer or C & db q4h or x 6	2
81	IPPB or Maximist bid or x 2	2
82	q6h or x 4	4
83	q4h or x 6	6
84	Croup tent or mist tent	8
85	Chest pulmonary therapy bid or x 2	2
86	q6h or x 4	4
87	q4h or x 6	6

# SECTION 1 - CRITICAL INDICATORS

## RESPIRATORY THERAPY (cont'd)

	RESPIRATORY THERAPY								
88	Suctioning q4h or x 6	2							
89	q2h or x 12	4							
90	Ventilator	10							
91	Trachsostomy care x 3	4							

# SECTION 1 - CRITICAL INDICATORS

---

## TEACHING

	TEACHING								
92	Teaching - group - per hour	2							
93	- individual - per 30 minutes	4							

# SECTION 1 - CRITICAL INDICATORS

---

## EMOTIONAL SUPPORT

	EMOTIONAL SUPPORT							
94	Patient / family support per 30 minutes	4						
95	Lifestyle modification per 30 minutes	4						
96	Sensory deprivation - blind, deaf, retarded, etc.	6						
97	Maximum points for emotional support	10						



# PATIENT ACUITY SHEET (PSYCHIATRIC)

Enter Date, RN Initials, and Last Four S.S.N ---->

Acuity Code	SECTION 1 - CRITICAL INDICATORS (continued)	POINT VALUES
128	TREATMENTS/PROCEDURES/MEDICATIONS continued	
129	accompany patient off unit - 15 minutes	2
130	- 30 minutes	4
131	- 45 minutes	6
132	Other activities - 15 minutes	2
133	- 30 minutes	4
134	- 45 minutes	6
135	Each hour requiring continuous staff attendance	8
136	purposeful interaction - 15 minutes	2
137	- 30 minutes	4
138	- 45 minutes	6
139	- 1 hour	8
140	Sensory deprivation - blind, deaf, retarded, etc.	6
141	Group activity, on unit - staff ratio 1: 4-5	2
142	off unit - staff ratio 1: 4-5	2
143	meeting - staff ratio 1: 4-5	2
144	TEACHING	
145	teaching - group per hour	2
	- individual per 30 minutes	4
	CONTINUOUS	
	Patient requiring 1 : 1 coverage all shifts	96

SUBTOTAL B POINT VALUE	
SUBTOTAL A POINT VALUE	
TOTAL POINT VALUE	
CATEGORY	

SECTION 11 - ADDITIONAL DATA  
 ACUITY TABLE  
 Category 0- 0 points  
 Category I- 1- 12 points  
 Category II- 13- 31 points  
 Category III- 32- 63 points  
 Category IV- 64- 95 points  
 Category V- 96-145 points  
 Category VI- 146-262 points

(continued on other side)

TYPE OF PATIENT
Hed/Surg
ICU
NICU
Nursery
Antepartum/Postpartum
Pediatric
Psychiatric

Check the appropriate box.

Addressograph

Enter Date, RN Initials, and Last Four S.S.N ---->

Acuity Code	SECTION 1 - CRITICAL INDICATORS	POINT VALUES
100	VITAL SIGNS (Manual TPR, BP)	
101	Vital signs qid or less	1
102	q4h or x 6	2
103	q3h or x 8	3
104	q2h or x 12	4
105	q1h or x 24	8
106	Tilt test q4h or more	2
107	MONITORING	
108	Intake and output q4h	2
109	Circulation checks q2h or x 12	2
110	Patient checks q30 minutes x 8	8
111	q15 minutes x 8	16
112	Neuro checks q4h or x 6	3
113	ACTIVITIES OF DAILY LIVING	
114	Care - age 6 or more - Self/Minimal	2
115	- Assisted	6
116	- Complete	14
117	FEEDING	
118	Spoon feed or 1:1 at meals tid	6
119	Tube feed - bolus q4h or x 6	5
120	Escort patient to dining hall	2
121	TREATMENTS/PROCEDURES/MEDICATIONS	
122	Start IV/acc wraps/Tube care	2
123	Dressing - simple 5 - 7 mins x 2	2
124	- complex 30 mins x 1	4
125	Lab tests performed/collected on the unit x 3	2
126	Do EKG	2
127	Venipuncture, arterial puncture x 2	2
128	Medications - exclude IV- 3-11 trips q3h - q8h	2
129	Medications - exclude IV- 12 trips or more q2h	4
130	Restraints, 2 point, 4 point, Posey	2
131	New admission - assessment and orientation	12
132	Transfer - between psych units (receiving unit only)	4
	SUBTOTAL A POINT VALUE	



# SECTION 1 - CRITICAL INDICATORS

## VITAL SIGNS (Manual, TPR, BP)

Addressograph		Enter Date RN Initials and Last Four S.S.N. --- -->	POINT VALUES
ACUITY CODE	SECTION 1 - CRITICAL INDICATORS		
	VITAL SIGNS (Manual TPR, BP)		
100	Vital signs qid or less	1	
101	q4h or x 6	2	
102	q3h or x 8	3	
103	q2h or x 12	4	
104	q1h or x 24	8	
105	Tilt test q4h or more	2	

# SECTION 1 - CRITICAL INDICATORS

---

## MONITORING

	MONITORING								
106	Intake and output q8h	2							
107	Circulation checks q2h cr x 12	2							
108	Patient checks q30 minutes x 8	8							
109	q15 minutes x 8	16							
110	Neuro checks q4h or x 6	3							

# SECTION 1 - CRITICAL INDICATORS

## ACTIVITIES OF DAILY LIFE

	ACTIVITIES OF DAILY LIFE								
111	Care - age 6 or more - Self / Minimal	2							
112	- Assisted	6							
113	- Complete	14							

# SECTION 1 - CRITICAL INDICATORS

---

## FEEDING

	FEEDING								
114	SPOON FEED OR 1:1 AT MEALS TID	6							
115	Tube feed - bolus q4h or x 6	5							
116	Escort patient to dining hall x 3	2							

# SECTION 1 - CRITICAL INDICATORS

## TREATMENTS / PROCEDURES / MEDICATIONS

	TREATMENTS / PROCEDURES / MEDICATIONS						
117	Start IV / Ace wraps / Tube care	2					
118	Dressing - simple 5 - 7 mins x 2	2					
119	- Complex 30 mins x 1	4					
120	Lab tests performed / collected on the unit x 3	2					
121	Do EKG	2					
122	Venipuncture, arterial puncture x 2	2					
123	Medications - exclude IV - 3-11 trips q3h-q8h	2					
124	Medications - exclude IV - 12 trips or more q2h	4					
125	Restraints, 2 point, 4 point, Posey	2					
126	New admission - assessment and orientation	12					
127	Transfer - between psych units (receiving unit only)	4					
////////	////////// SUBTOTAL A POINT VALUE	////////					



# SECTION 1 - CRITICAL INDICATORS

## THERAPEUTIC INTERVENTIONS / ACTIVITIES

135	PURPOSEFUL INTERACTION - 15 MINUTES	2							
136	PURPOSEFUL INTERACTION - 30 MINUTES	4							
137	PURPOSEFUL INTERACTION - 45 MINUTES	6							
138	PURPOSEFUL INTERACTION - 1 HOUR	8							
139	SENSORY DEPRIVATION - BLIND, DEAF, RETARDED. ETC.	6							
140	OTHER ACTIVITY, ON UNIT - STAFF RATIO 1:4 - 5	2							
141	OFF UNIT - STAFF RATIO 1:4 - 5	2							
142	MEETING - STAFF RATIO 1:4 - 5	2							





## THE DATA COMES FROM

- Physicians orders/medical care plans
- Nurses orders/nursing care plans
- Hospital/unit standards of care or SOP's
- Prediction by the RN of care required over 24 hour period

# GUIDELINES FOR INTERPRETATION OF CRITICAL INDICATORS

EACH POINT EQUALS 7.5 MINUTES OF NURSING TIME

EACH CRITICAL INDICATOR INCLUDES TIME TO:

- Identify Patient
- Explain Procedure
- Answer Questions
- Clear Area
- Record Activity
- ASSESSMENT AND TEACHING

## INDIRECT CARE

- 1. Charting, Phone, Cleaning
- 2. Unpredicted needs -- changes in patient condition, admissions, care conferences, personal time, staff education.
- 3. Teaching Hospital allowance.
- 4. Semi-private room allowance.

# INDIRECT CARE PERCENTAGES

MED-SURG	-----	76%
OB-GYN	-----	77.8%
PEDS	-----	72.7%
PSYCH	-----	68.9%
ICU	-----	66%
NURSERY	-----	63%

**ARMY AVAILABILITY FACTOR**

**MILITARY AND CIVILIAN PERSONNEL ARE AVAILABLE 145 HOURS PER MONTH FOR THE ACCOMPLISHMENT OF AUTHORIZED MISSIONS**

**NON-PRODUCTIVE TIME HAS BEEN FACTORED OUT:**

- LEAVE                      ORGANIZATIONAL DUTIES**
- MEDICAL                    PCS-RELATED AND NEW HIRE ORIENTATION**
- TRAINING                    MISCELLANEOUS**

290 = CONSTANT MAN-HOURS REQUIRED (OVERHEAD FOR HEAD  
NURSE AND WARDMASTER) IN CONUS

CONUS CONSTANT MAN-HOURS REQUIRED = 435 (OVERHEAD FOR  
HEAD NURSE, WARDMASTER, AND 1 ADDITIONAL REQUIREMENT  
FOR READINESS

# SPECIAL CONSIDERATIONS

## UNITS PROVIDING CARE FOR:

- OUTPATIENTS
  - AFTER HOURS RECOVERY
  - ONE DAY SURGERIES
1. ADD TOTAL POINTS FOR ALL PATIENTS
  2. DIVIDE BY 12
  3. EQUATES TO NUMBER OF CATEGORY ONE PATIENTS

## CATEGORIES

<u>CATEGORY</u>	<u>CARE DESCRIPTION</u>
Category 0	On Pass
Category I	Self/Minimal Care
Category II	Moderate Care
Category III	Acute Care (Ratio 1:3)
Category IV	Intensive Care (1:2)
Category V	Continuous Care (1:1)
Category VI	Critical Care (>1:1)

## WMSM PROCEDURE

- Accumulated categories determine nursing care hours
- Nursing care hours convert to staffing
- Specific to seven clinical areas:  
MED/SURG  
PEDIATRICS  
OB/GYN  
NURSERY  
NEONATAL ICU  
CRITICAL CARE  
Psychiatric

SAMPLE PAGE

MEDICAL-SURGICAL  
NURSING CARE HOUR REQUIREMENTS

PATIENTS	CATEGORY					
	I	II	III	IV	V	VI
1	2	5	11	18	27	45
2	3	10	21	36	54	91
3	5	15	32	53	81	136
4	6	20	43	71	108	182
5	8	25	54	89	135	227
6	10	29	64	107	161	272
7	11	34	75	125	188	318
8	13	39	86	142	215	363
9	14	44	96	160	242	409
10	16	49	107	178	269	454
11	18	54	118	196	296	499
12	19	59	128	214	323	545
13	21	64	139	231	350	590
14	22	69	150	249	377	636
15	24	74	161	267	404	681
16	26	78	171	285	430	726
17	27	83	182	303	457	772
18	29	88	193	320	484	817
19	30	93	203	338	511	863
20	32	98	214	356	538	908
21	34	103	225	374	565	953
22	35	108	235	392	592	999
23	37	113	246	409	619	1044
24	38	118	257	427	646	1090
25	40	123	268	445	673	1135
26	42	127	278	463	699	1180
27	43	132	289	481	726	1226
28	45	137	300	498	753	1271
29	46	142	310	516	780	1317
30	48	147	321	534	807	1362

\* THIS CHART INDICATES REQUIREMENTS FOR A MED-SURG AREA. THERE ARE CHARTS FOR EACH SPECIALTY: Pediatrics, psychiatry, critical care, nursery and OB/GYN.

AS OF: 01 Nov 87

115

MEDICAL/SURGICAL  
DAILY PERSONNEL REQUIREMENTS CHART - 8 HOURS

NCH RANGE	TOTAL HOUR	24 STAFF	D A Y S			E V E N I N G S			N I G H T S		
			RN	LPN	NA	RN	LPN	NA	RN	LPN	NA
1 - 48	48	6	1	0	1	1	0	1	1	0	1
49 - 56	56	7	1	1	1	1	0	1	1	0	1
57 - 64	64	8	2	1	1	1	0	1	1	0	1
65 - 72	72	9	2	1	1	1	1	1	1	0	1
73 - 80	80	10	2	1	2	1	1	1	1	0	1
81 - 88	88	11	2	1	2	2	1	1	1	0	1
89 - 96	96	12	2	2	2	2	1	1	1	0	1
97 - 104	104	13	2	2	2	2	1	1	1	1	1
105 - 112	112	14	2	2	2	2	1	2	1	1	1
113 - 120	120	15	3	2	2	2	1	2	1	1	1
121 - 128	128	16	3	2	2	2	2	2	1	1	1
129 - 136	136	17	3	2	3	2	2	2	1	1	1
137 - 144	144	18	3	2	3	2	2	2	2	1	1
145 - 152	152	19	4	2	3	2	2	2	2	1	1
153 - 160	160	20	4	2	3	3	2	2	2	1	1
161 - 168	168	21	4	3	3	3	2	2	2	1	1
169 - 176	176	22	4	3	3	3	2	3	2	1	1
177 - 184	184	23	4	3	3	3	2	3	2	1	2
185 - 192	192	24	4	3	4	3	2	3	2	1	2
193 - 200	200	25	4	3	4	4	2	3	2	1	2
201 - 208	208	26	5	3	4	4	2	3	2	1	2
209 - 216	216	27	5	3	4	4	3	3	2	1	2



**EXPANSION OF THE WORKLOAD  
MANAGEMENT SYSTEM FOR NURSING**

**EMERGENCY ROOM  
LABOR AND DELIVERY**

**POST ANESTHESIA  
OUTPATIENT CARE**

# HIGHLY VALID RELIABLE AND QUANTIFIABLE

INTER-RATER RELIABILITY, USING GOODMAN-KRUSKAL  
GAMMA WAS .957 AND .960

PEARSON PRODUCT MOMENT CORRELATION BETWEEN RAW DATA  
FROM WMSN AND NCHS INSTRUMENT WAS .89

PEARSON PRODUCT MOMENT CORRELATION FOR INTERNAL  
CONSISTENCY AMONG CRITICAL FACTOR GROUPS WAS .94

AVERAGE DAILY COMPARISON OF REQUIRED STAFF TO ACTUAL STAFF BY WORK CENTER  
 Facility: FT TOMCAT Section: ALL SECTIONS

For the month of March 1987

Section	Staff	Average Actual Daily Staff:			Total Avg Daily Staff	Required Avg Daily Staff	Diff- erence	Percnt Diff- erence
		Regular	Overtime	Borrowed				
CRIT CARE	RN	27.3	0.0	0.0	27.3	36.0	-8.7	-31%
	LPN	19.5	0.0	0.0	19.5	14.7	4.8	24%
	NA	5.0	0.0	0.0	5.0	9.9	-4.9	-98%
Section	Total	51.8	0.0	0.0	51.8	60.6	-8.8	-16%
SURG	RN	34.5	0.0	0.0	34.5	27.1	7.4	21%
	LPN	22.8	0.0	0.0	22.8	8.8	14.0	61%
	NA	8.1	0.0	0.0	8.1	40.4	-32.3	-398%
Section	Total	65.4	0.0	0.0	65.4	76.3	-10.9	-16%
	RN	61.8	0.0	0.0	61.8	63.1	-1.3	21%
	LPN	42.3	0.0	0.0	42.3	23.5	18.8	61%
	NA	13.1	0.0	0.0	13.1	50.3	-37.2	-398%
FACILITY TOTAL		117.2	0.0	0.0	117.2	136.9	-19.7	-16%

\* Difference = Total Daily Avg - Required Daily Avg

Date/Time: 10 Apr 87 15:00:01

Page: 3

Sample Report by Facility

DAILY SUMMARY REPORT

PREPARED:

APC/NURSING UNIT XXXX XXXXXX XXXXXXXXXXXXXXXXXXXX

HOSPITAL NAME:  
NURSING UNIT:

WORK CENTER  
STATUS

BEDS AVAILABLE XXX  
TOTAL IN XX  
TOTAL OUT XX  
CURRENT CENSUS XXX  
OCCUPANCE RATE XXXX

PATIENTS BY CATEGORY

	I	II	III	IV	V	VI
NUMBER OF PATIENTS	XXX	XXX	XXX	XXX	XXX	XXX
PERCENT OF CENSUS	XXX%	XXX%	XXX%	XXX%	XXX%	XXX%

STAFFING

	PROF	TECH	PARA	ADMIN
NUMBER REQUIRED	XX	XX	XX	XX
HOURS REQUIRED	XXX	XXX	XXX	XXX

WMSN

MONTHLY SUMMARY REPORT MONTH ENDING:

HOSPITAL NAME:

NURSING UNIT:

PATIENTS BY CATEGORY

	I	II	III	IV	V	VI
NUMBER OF PATIENTS	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX
PERCENT OF CENSUS	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX

STAFFING

	PROF	TECH	PARA	ADMIN
NUMBER REQUIRED	XXX	XXX	XXX	XXX
HOURS REQUIRED	XXXX	XXXX	XXXX	XXXX
NUMBER AVAILABLE	XXX	XXX	XXX	XXX
HOURS AVAILABLE	XXXX	XXXX	XXXX	XXXX

PREPARED:

WORK CENTER STATUS

SEDS AVAILABLE	XXX
TOTAL IN	XX
TOTAL OUT	XX
CURRENT CENSUS	XXX
OCCUPANCY RATE	XXXX

NURSING WORKLOAD MANAGEMENT SYSTEM  
 HOSPITAL PROFILE  
 HOSPITAL NAME:

CUMULATIVE DATA FROM JAN 1985 THROUGH DEC 1985

SHIFT	AVERAGE STAFFING			AVERAGE RECOMMENDED STAFFING			DIFFERENCE	
	TOTAL	RN	NRN	TOTAL	RN	NRN	TOTAL	NRN
TOTAL	67.6	26.9	40.7	69.3	31.1	38.2	-1.7	-4.2
AM	25.2	8.6	16.6	27.9	11.8	16.1	-2.7	-3.2
PM	22.5	9.6	12.9	22.4	10.1	12.3	0.1	-0.5
NIGHT	19.9	8.7	11.2	19.0	9.2	9.8	0.9	-0.5

	AVERAGE NUMBER OF PATIENTS	AVERAGE NURSE CARE HOURS
TOTAL	79.1	489.8
CLASS 1	17.3	27.3
CLASS 2	45.4	219.5
CLASS 3	12.0	125.8
CLASS 4	2.2	38.3
CLASS 5	0.9	22.2
CLASS 6	1.3	56.7

*Revised Nursing 24 hr report*

NURSING UNIT 24 HOUR REPORT		WARD/UNIT	CAPACITY	CENSUS AT 0700	DATE
For use of this form, see AR 40-407; the proponent: agency is the Office of The Surgeon General.					
ADM DATA	DAY	EVENING		NIGHT	
CENSUS					
ADMISSIONS					
TRANSFER IN					
TRANSFER OUT					
DISPOSITIONS					
VACANT BEDS					
NURSES SIGNATURE					

NURSING CARE HOURS STAFFING REPORT SECTION					
Acc/Rec	RN	LPN	NA	% Staffing	DATE/TIME
DAY				DAY	
EVE				EVE	
NIT				NIT	

* For % Staffing less than 80%, Comment Mandatory	
DIAGNOSIS/SURGICAL PROCEDURE	ASSESSMENT/COMMENTS*/MOVEMENT
HOSPITAL DAY POST-OP DAY DAY EVENING NIGHT	HOSPITAL DAY POST-OP DAY DAY EVENING NIGHT

NURSING CARE HOURS STAFFING REPORT SECTION	
Acc/Rec	RN LPN NA % Staffing
DAY	DAY
EVE	EVE
NIT	NIT

## **USE OF WMSN INFORMATION**

- **JUSTIFY CURRENT MANPOWER**
- **JUSTIFY ADDITIONAL  
PERSONNEL**
- **IMPROVE UTILIZATION  
OF PERSONNEL**
- **DISTRIBUTE WORKLOAD**
- **MONITOR SPECIFIC NURSING  
RELATED ISSUES:  
DOCUMENTATION  
NURSING QA**

## POTENTIAL USES

- ESTABLISHING HISTORICAL TREND ANALYSIS OF ACUITY LEVELS
- DEFINING DIAGNOSIS--RELATED WORK FACTORS
- COMBINING DIAGNOSIS WORK FACTORS & ACUITY FACTORS
- SETTING STAFFING CLASSIFICATION RATIOS ACCORDING TO ACUITY ANALYSIS
- INDICATE INPATIENT PHARMACY WORKLOAD
- ESTABLISH OVERALL QA PROGRAMS
- COMPARE PHYSICIANS HEALTH CARE PRACTICES FOR EFFICIENCY

INTEGRATION OF HOSPITAL SERVICE QUALITY  
WITH OBJECTIVE CLINICAL QUALITY  
AND COST EFFICIENCY MEASURES

1. Analyze the hospital's overall performance and determine each product line's quality and cost efficiency positions.
2. Document the variations within the medical staff's practice patterns and encourage discussions of their significance.
3. Analyze the quality and cost efficiency patterns of the hospital's competitors.
4. Create an educational environment to facilitate appropriate changes in the physician's clinical practice patterns.
5. Establish a plan for ongoing monitoring of clinical quality and cost efficiency which includes feedback

**HOMETOWN GENERAL HOSPITAL**  
**1257 Genesee Avenue, Southwest**  
**Hometown, California 92037**

**UNIFORM HOSPITAL DISCHARGE DATA SET**

Patient Name Louis Underwood

Date of Birth 04/13/21

Age 65

Sex M

Address 39 Madison  
street

Hometown  
city

CA  
state

92037  
zip

Home Phone (619) 475-3025

Work Phone \_\_\_\_\_

Occupation \_\_\_\_\_

Employed By \_\_\_\_\_

Medical Insurance Co. Medicare

Group Number \_\_\_\_\_

Referring Physician M. Anderson

Transferring Facility Central Valley Hospital

Attending Physician C. Goodheart

Service Cardiac Surgery

Admitting Diagnosis Chest Pain

Principal Diagnosis Subendocardial Myocardial Infarction

Secondary Diagnoses COPD

Aortic Stenosis

Principal Procedure Double Internal Mammary Coronary Artery Bypass

Secondary Procedures Cardiac Catheterization

Pulmonary Angiogram

Date of Admission 02/20/86

Date of Discharge 02/26/86

Discharge Status (Home, Transfer, Dead) D

Post Mortem? N

Total Charges \$45,689

**HOMETOWN GENERAL HOSPITAL**  
**1257 Genesee Avenue, Southwest**  
**Hometown, California 92037**

**UNIFORM HOSPITAL DISCHARGE DATA SET**

Patient Name Bob Weber

Date of Birth 08/24/39

Age 57

Sex M

Address 1460 Willow  
street

Valley  
city

CA  
state

92037  
zip

Home Phone (619) 235-6470

Work Phone \_\_\_\_\_

Occupation Postal Worker

Employed By

U.S. Postal Office

Medical Insurance Co. Maximum HMO

Group Number \_\_\_\_\_

Referring Physician N. Rudy

Transferring Facility Maximum HMO

Attending Physician G. Havey

Service Cardiology

Admitting Diagnosis Chest Pain

Principal Diagnosis Angina

Secondary Diagnoses Coronary Artery Disease

Status - post Carotid Thromboendarterectomy

Atelectasis

Principal Procedure Emergency Myocardial Revascularization

Secondary Procedures

Date of Admission 03/07/86

Date of Discharge 03/21/86

Discharge Status (Home, Transfer, Dead)

Home

Post Mortem? \_\_\_\_\_

Total Charges \$37,931

**HOMETOWN GENERAL HOSPITAL**  
**1257 Genesee Avenue, Southwest**  
**Hometown, California 92037**

**UNIFORM HOSPITAL DISCHARGE DATA SET**

**Patient Name** Edward Davis

**Date of Birth** 05/25/06

**Age** 82

**Sex** M

**Address** 1320 Santa Anna  
street

**Plainsville** CA  
city state

**92101**  
zip

**Home Phone** (916) 864-3221

**Work Phone** \_\_\_\_\_

**Occupation** Retired

**Employed By** \_\_\_\_\_

**Medical Insurance Co.** Medicare

**Group Number** \_\_\_\_\_

**Referring Physician** D. Strong

**Transferring Facility** Plainsville Nursing Home

**Attending Physician** P. Richards

**Service** Cardiac Surgery

**Admitting Diagnosis** Chest pain

**Principal Diagnosis** Subendocardial Myocardial Infarction

**Secondary Diagnoses** Cirrhosis of Liver

3rd degree heart block

COPD

CVA

**Principal Procedure** Double Internal Mammary Coronary Artery Bypass

**Secondary Procedures** Cardiac Catheterization

IVP

**Date of Admission** 10/27/86

**Date of Discharge** 11/29/86

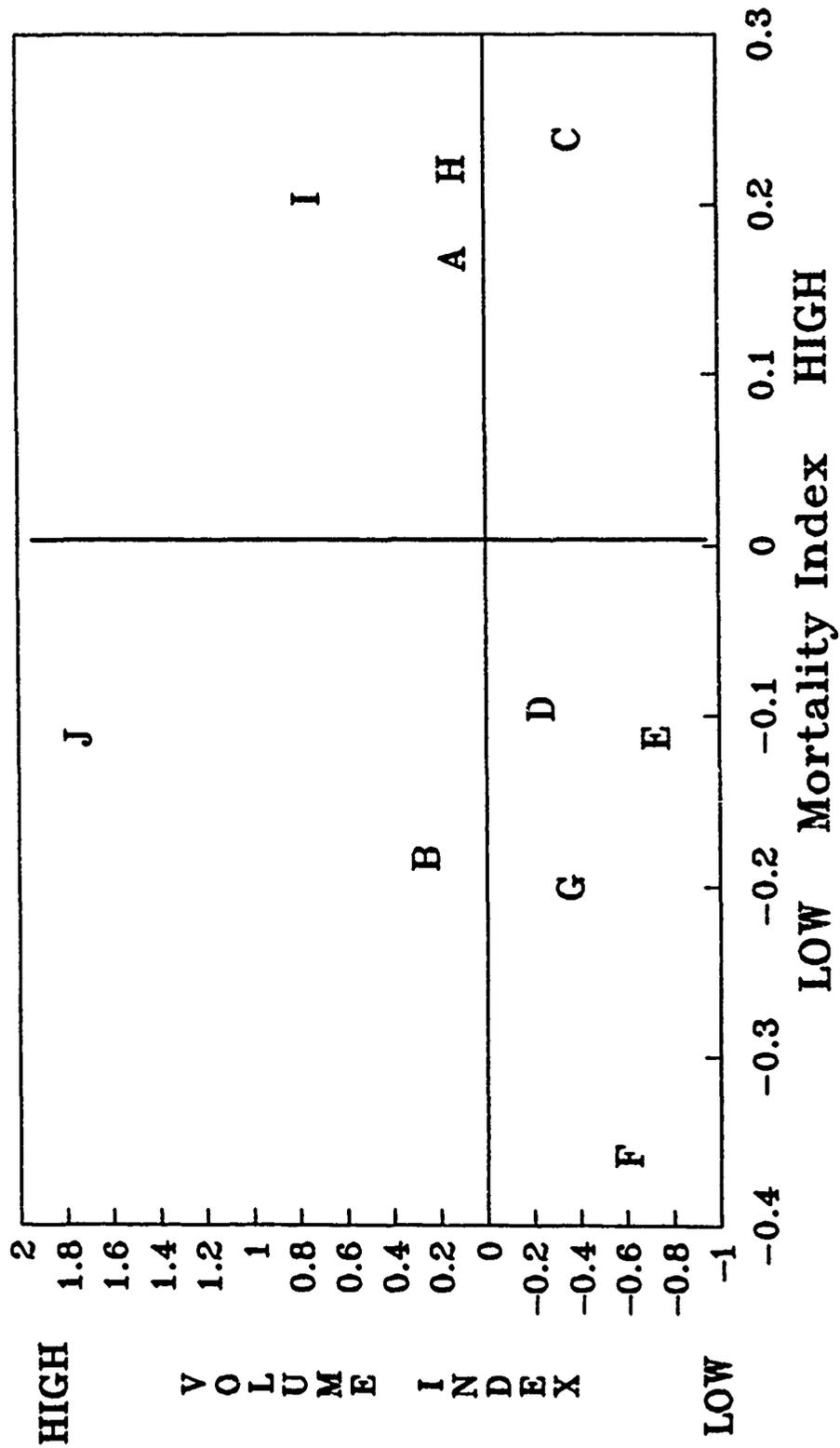
**Discharge Status (Home, Transfer, Dead)** D

**Post Mortem?** Y

**Total Charges** \$76,840

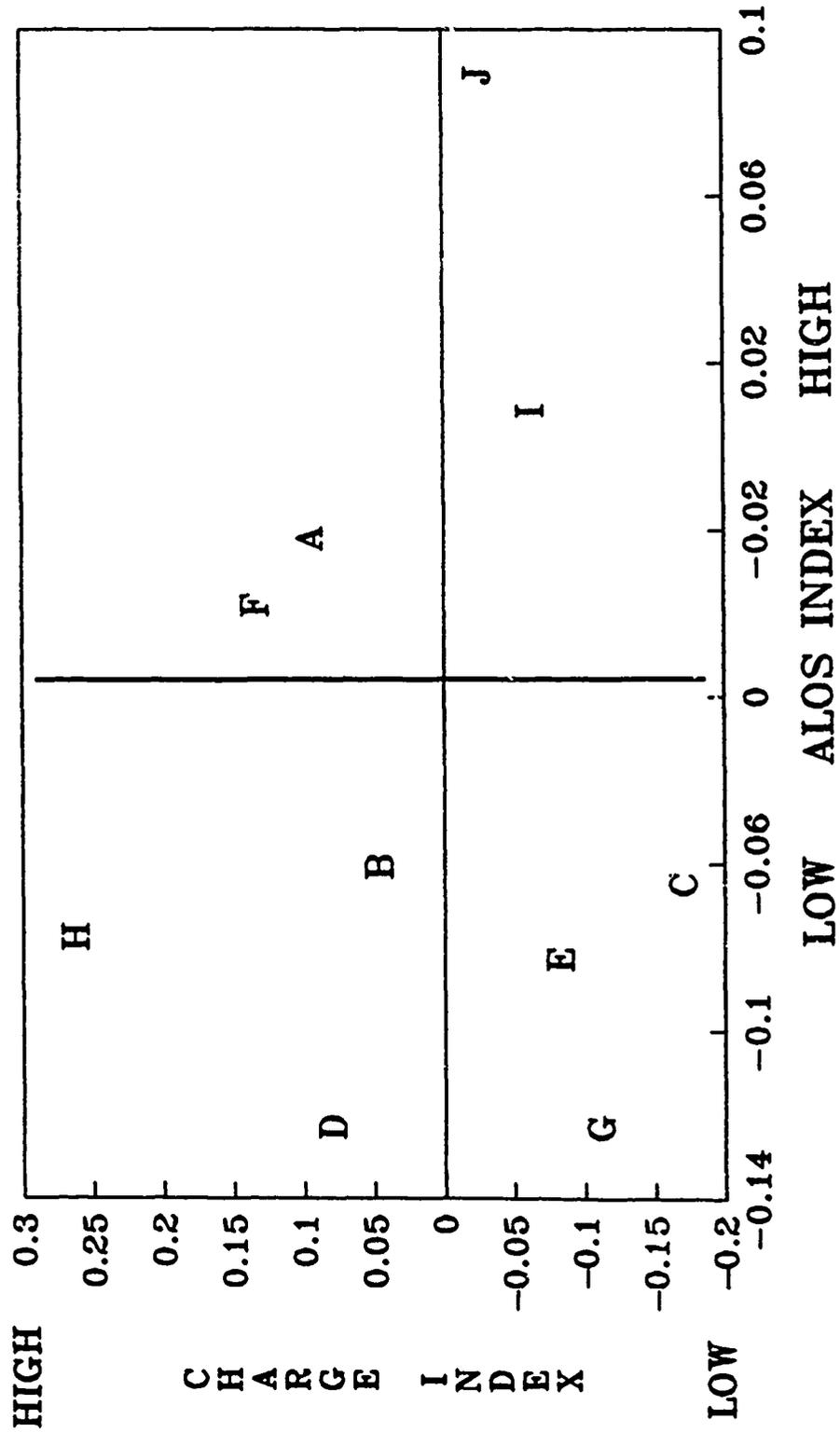
# VOLUME AND MORTALITY INDEX

## Internal Medicine

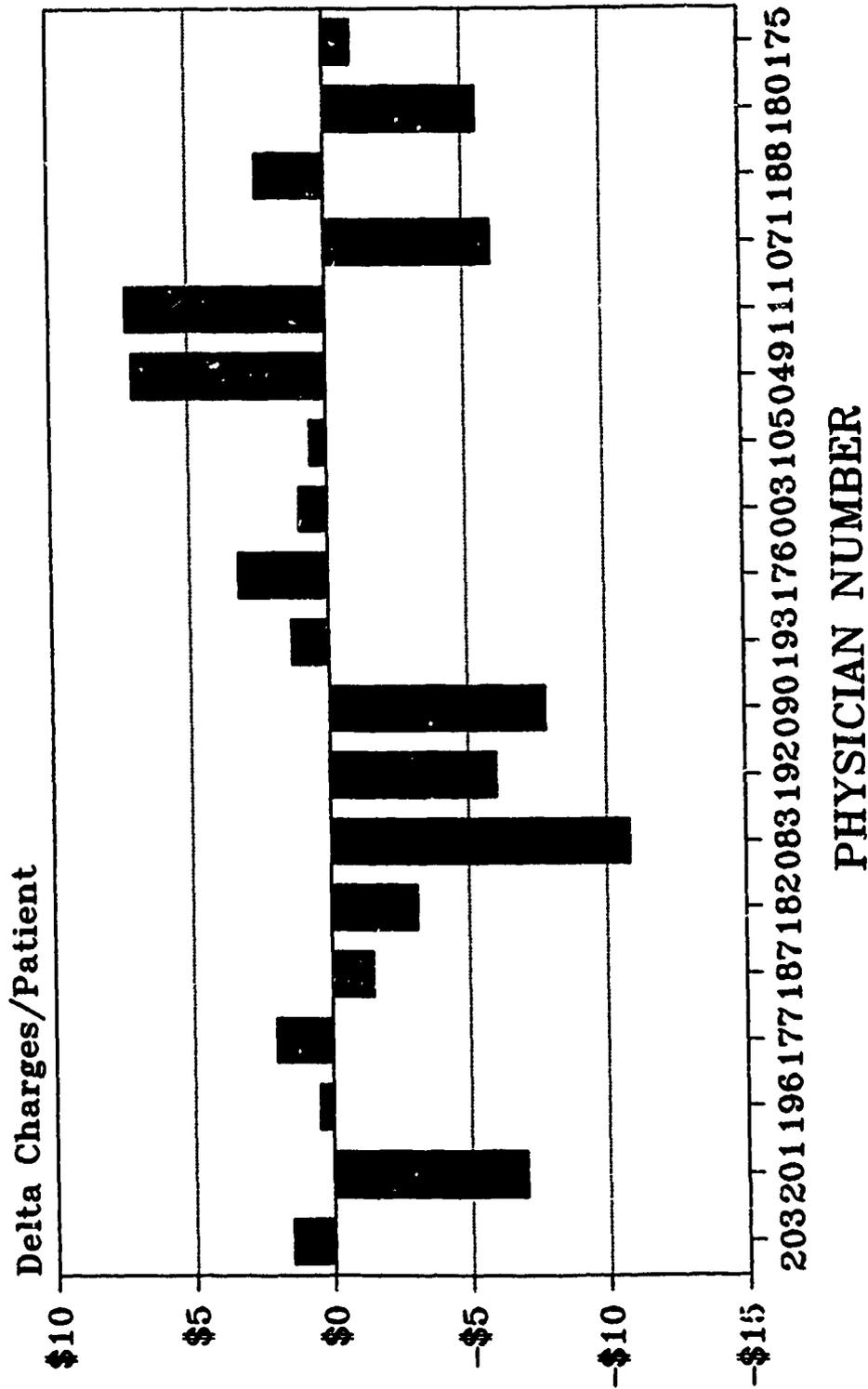


# CHARGE AND ALOS INDEX

## Internal Medicine

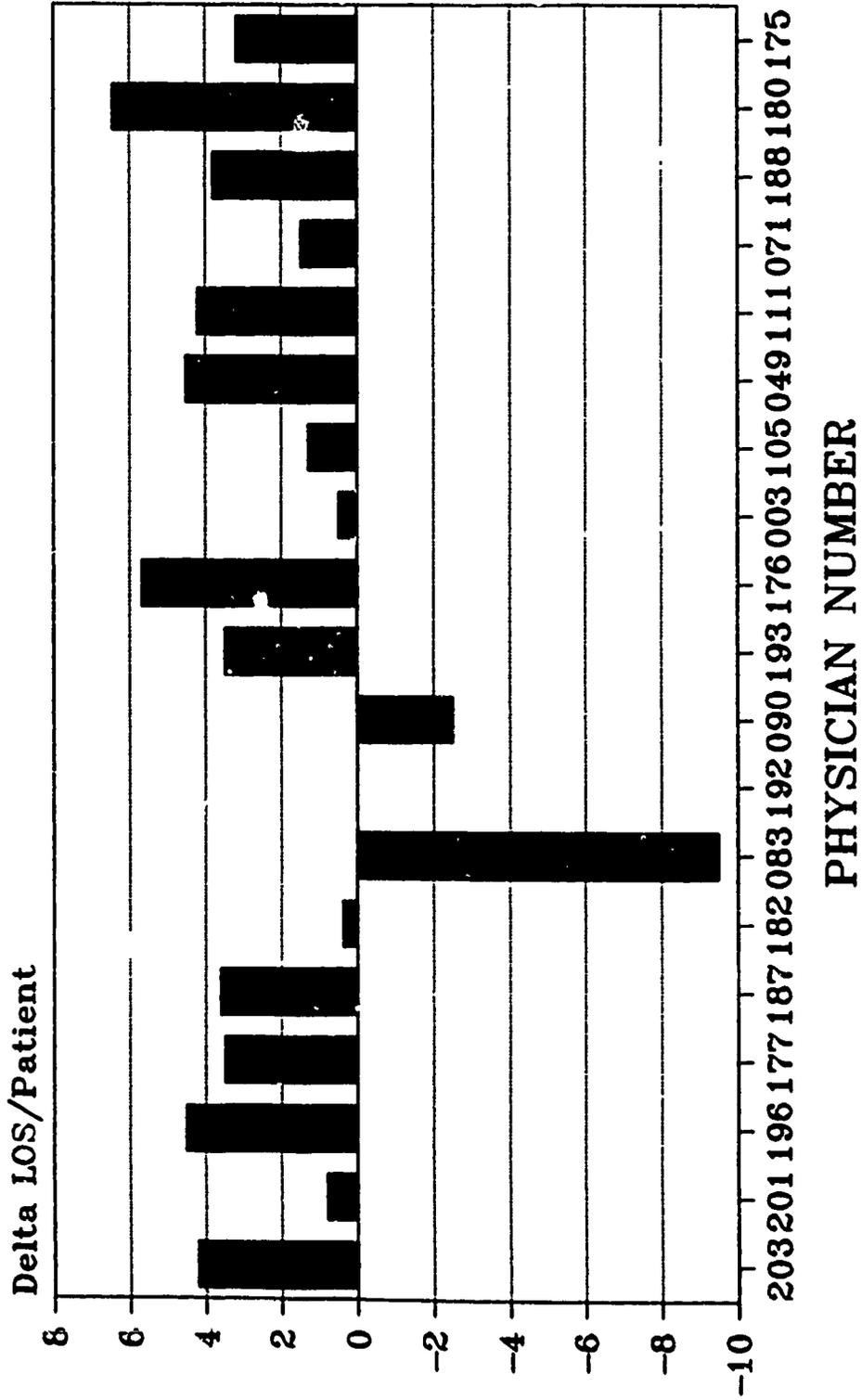


# COMPARATIVE PHYSICIAN PROFILES DRG 121:M.I. W/COMPLICATIONS



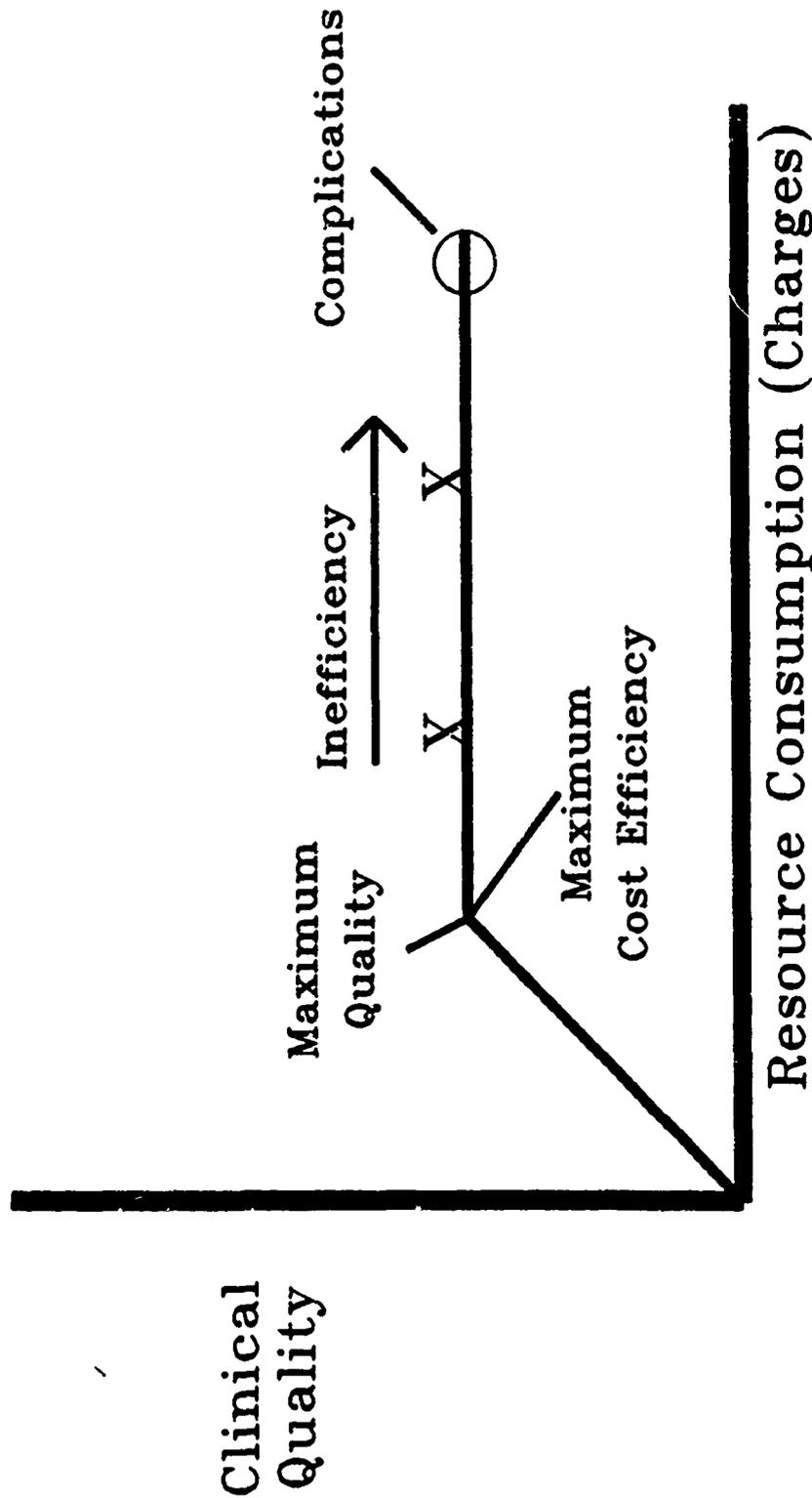
(Thousands)

# COMPARATIVE PHYSICIAN PROFILES DRG 121:M.I. W/COMPLICATIONS

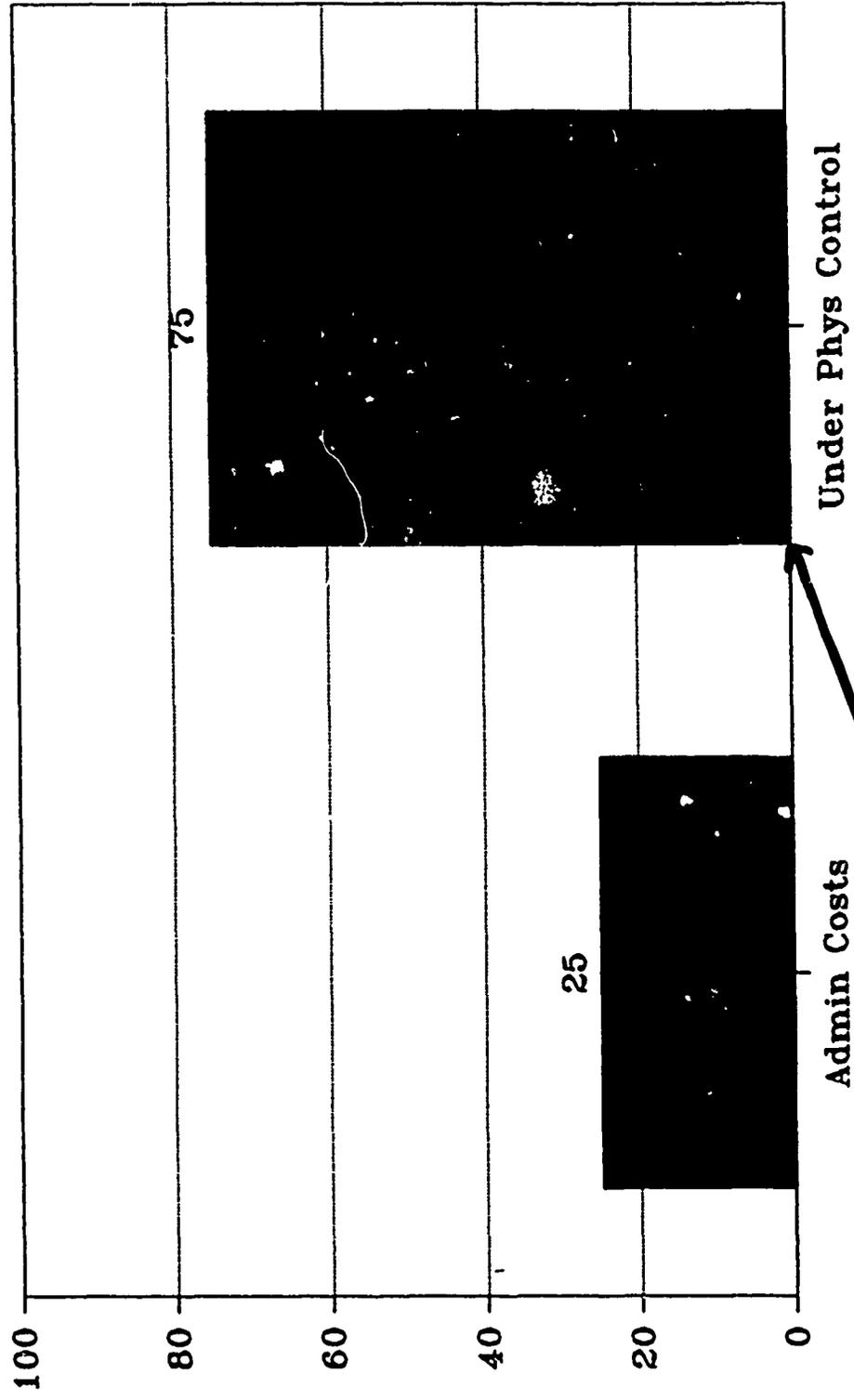


# Relationship Between Clinical Quality And Patient Resource Consumption

Source: IAMETER, Inc. San Mateo, CA



# TOTAL INPATIENT CHARGES



\* 60% of this is estimated to be Nursing/Support Personnel Costs

Source: IAMETER, Inc.  
San Mateo, CA

- Resources are allocated by the Doctor's Ordering Pen
- There are wide variations in physician use of resources for otherwise similar patients
- Tendency to overuse resources occurs most often at the lower acuity levels

**APPENDIX D**

**Revised Survey Instrument**

1. Do physicians have a *large* or a *small* influence on the Workload Management System for Nursing?
2. Can orders written by physicians after the *patient acuity levels* have been calculated contribute to lower nurse staffing?
3. According to WMSN, which category of patient requires a one-staff-to-one-patient ratio?
4. Describe one way the WMSN affects the quality of health care.
5. Is the WMSN used at your hospital?
6. Name one reason why we need a nursing workload management system.
7. How does the WMSN check for accuracy of patient category coding?
8. Is WMSN research-based?
9. What specific categories of patients would especially require coordination with the ward nurse before placement?
10. Name a WMSN *measurable* aspect of care that is ordered entirely by the nurse.
11. Is the staffing recommended by WMSN inflated, optimal, maximum, average, or minimum needed?
12. Are WMSN standards developed for all areas in the hospital nursing environment?

**Revised Survey Instrument Key**

1. Large.
2. Yes.
3. Category 5.
4. Justifies increased staffing (numbers and mix) to provide quality care.
5. Yes, *all* DOD hospitals use WMSN.
6. JCAHO requirements and staffing requirements.
7. Inter-rater reliability testing is performed regularly, using an independent assessment person.
8. Yes.
9. Categories 4 - 6.
10. Teaching, emotional support.
11. Average.
12. No.

## APPENDIX E

**Means, Standard Deviations, Skewness  
and Kurtosis Comparisons**

<b>Measure</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Skewness</b>	<b>Kurtosis</b>
Pre-Test	23	3.83	3.03	0.885	0.496
Post-Test	23	10.91	3.25	-0.687	-0.597
Both Tests Combined	46	7.37	4.74	0.073	-1.333

## APPENDIX F

## Descriptive Statistics for Pre- and Post-Test

		<b>Pre-Test</b>	<b>Post-Test</b>
N of Cases	=	23	23
Minimum	=	0	4
Maximum	=	12	15
Range	=	12	11
Median	=	2	12
Mean	=	3.826	10.913
Mode	=	2	12,13
Variance	=	9.150	10.538
Standard Deviation	=	3.025	3.246
Standard Error	=	0.631	0.677
Skewness	=	0.885	0.687
Kurtosis	=	0.496	0.598
Co-Variance	=	0.791	0.297
Mean of Correct Answers	=	5.933	16.733
Mean of Incorrect Answers	=	17.133	6.266

## APPENDIX G

**Frequency Distribution by Test Question  
for Pre-Test**

<b>Question</b>	<b>No. of People Getting Correct Answer</b>	<b>No. of People Getting Incorrect Answer</b>	<b>Percent Correct</b>	<b>Percent Incorrect</b>
1	5	18	21.74	78.26
2	12	11	52.17	47.83
3	2	21	8.70	91.30
4	10	13	43.48	56.52
5	4	19	17.39	82.61
6	15	8	65.22	34.78
7	1	22	4.35	95.65
8	13	10	56.52	43.48
9	8	15	34.78	65.22
10	6	17	26.09	73.91
11	3	20	13.04	86.96
12	3	20	13.04	86.96
13	2	21	8.70	91.30
14	2	21	8.70	91.30
15	2	21	8.70	91.30

## APPENDIX H

Frequency Distribution by Test Question  
for Post-Test

<b>Question</b>	<b>No. of People Getting Correct Answer</b>	<b>No. of People Getting Incorrect Answer</b>	<b>Percent Correct</b>	<b>Percent Incorrect</b>
1	16	7	69.57	30.43
2	21	2	91.30	8.70
3	11	12	47.83	52.17
4	18	5	78.26	21.74
5	23	0	100	0
5	16	7	69.57	30.43
7	16	7	69.57	30.43
8	23	0	100	0
9	17	6	73.91	26.09
10	18	5	78.26	21.74
11	18	5	78.26	21.74
12	19	4	82.61	17.39
13	11	12	47.83	52.17
14	6	17	26.09	73.91
15	18	5	78.26	21.74

APPENDIX I

Frequency Distribution by Score\*

for Pre-Test

Number of Correct Answers	Number of People Receiving That No. of Correct Answers	Percent of People Getting Correct Answers
0	3	13.04
1	1	4.35
2	7	30.43
3	1	4.35
4	2	8.70
5	2	8.70
6	4	17.39
7	1	4.35
9	1	4.35
12	1	4.35
	<u>N=23</u>	

\* Score = Number of correct answers

## APPENDIX J

Frequency Distribution by Score\*  
for Post-Test

<b>Number of Correct Answers</b>	<b>Number of People Receiving That No. of Correct Answers</b>	<b>Percent of People Getting Correct Answers</b>
4	1	4.35
5	1	4.35
6	1	4.35
7	2	8.70
9	2	8.70
10	1	4.35
11	2	8.70
12	4	17.39
13	5	21.74
14	1	4.35
15	3	13.04
	<u>N=23</u>	

\* Score = Number of correct answers

## APPENDIX K

Frequency Distribution of Change in Answers  
From Pre- to Post-Test

**Numbers of People  
Who Changed From  
An Incorrect Answer  
on the Pre-Test to a  
Correct Answer on  
the Post-Test**

**Question Number**

1	6
4	14
8	4
9	13
9	9
9	3
9	2
10	8
11	1
12	10
15	11
15	7
16	15
16	12
19	5