



Burn Dressings: A Critical Indicator for Patient Care Classification in Burn Units

CPT Dennis M. Driscoll, AN

DTIC
ELECTE
JUN 17 1992

Nursing services consume approximately 60% of a hospital personnel budget, requiring justification for staffing levels and manpower expenses. The lack of an adequate level of nursing care affects the operation of the entire health care team. The purpose of this descriptive study is to establish the mean tasking time to apply burn dressings. The number of nursing staff required to complete a burn dressing application is dependent on the location of injury and the ability of the patient to cooperate. Establishing the essential mean tasking time for routine post-operative dressing assists in the production of accurate reporting of nursing manpower requirements.

Introduction

The current economic climate of modern health care, particularly in critical care, requires hospital administrators to manage personnel with efficiency while maintaining quality of care. When the nursing staff is inadequate, the operations of all health care providers are affected. If nursing services require more resources to provide safe, high quality patient care, then such requirements must be documented using valid and reliable measurement tools. With nursing services consuming an estimated 60% of a hospital's total personnel budget, nursing staff levels and operating expenses must be justified.¹

Many nursing experts believe the quality of nursing care is greatest when the workload and staffing are balanced, with the staff assignments between 90 and 110% of recommended requirements. Staffing which falls below predetermined requirements precludes the completion of all essential nursing tasks, drastically compromising the quality of care.¹ Staffing at levels greater than recommended requirements impairs the quality of nursing care by encouraging excessive socialization among co-workers, relaxation of standards, and disregard for critical detail of care. Inappropriate staffing has been implicated in job dissatisfaction, which leads to excessive staff turnover. This may account for increased time and cost for recruitment and training of nursing staff replacements.

Since not all patients do not require the same nursing care, it is necessary to establish an accurate method to determine staffing needs. One method of documenting requirements is the use of patient classification systems. The primary goal of a classification system is to forecast patient care needs and estimate the essential staff levels required to provide safe care.

The Workload Management System for Nurses (WMSN) is a

combined effort within the Department of Defense to establish a valid, reliable patient classification system. It is a two-part system which first classifies patients into one of six distinct categories, and then provides staffing guidelines that determine the essential number and mix of personnel recommended to provide safe nursing care. The number and mix of nursing staff assigned to provide patient care may have a significant effect on the quality of care delivered and the way care is delivered by other health care team members. The classification system incorporates both direct and indirect nursing care requirements. The WMSN is based on research findings which established and validated mean tasking times for 357 direct nursing care activities.² The staffing method uses results from both the direct care studies and additional indirect nursing care studies.³⁻⁶

Direct nursing care activities require hands-on care or face to face communication in order to implement the prescribed care plan. These actions normally take place in the presence of the patient and/or family. The activities are observable behaviors that can include the following: placement of equipment at the bedside; explanation of a procedure to the patient; preparation of the patient; performance of the task; and routine teaching.^{5,7}

Indirect care comprises patient-centered activities completed away from the bedside, to include: communicating about patients; planning patient care; travel or patient transportation; transcribing orders; preparation of medication or equipment; managerial duties; and waiting time. A third category, termed "unavailable to provide patient care," includes activities such as housekeeping; clerical work; communicating with others; attending meetings; acquiring supplies; and doing errands. Some activities performed off the unit are unique to the military, such as field training exercises, administrative duty, and ceremonies. One study reported the use of nine agencies to collect data on 461 shifts, where 24.5% of staff time involved direct patient care, 60.5% involved indirect care duties, and 15% of the time the staff was unavailable for patient care.^{4,5,8} The ratio of direct to indirect patient care time varies between the different specialty areas. The majority of nursing time is spent in 11 categories, with a composite mean of 24.5% providing direct care (Fig. 1).⁴

In the WMSN, nursing care requirements are categorized using nine groups of critical indicators: vital signs; monitoring; activities of daily living; feeding; treatments/procedures/medications; intravenous therapy; teaching; emotional support; and continuous care. The classification tool contains a total of 99 factors. Each factor within a group carries a specific weight or point value. Nurses complete the WMSN patient classification on a daily basis, identifying the direct patient care activities projected for a 24-hour period. The number of points is totaled and the patients are classified into one of six categories of care. The categories of care range from 1, representing mini-

Nursing Service Branch, U.S. Army Institute of Surgical Research, Fort Sam Houston, TX 78234-5012

The opinions or assertions contained herein are the views of the author and are not to be construed as official or as reflecting the views of the Department of Defense.

This manuscript was received for review in October 1990. The revised manuscript was accepted for publication in March 1991.

Reprint & Copyright © by Association of Military Surgeons of U.S., 1991.



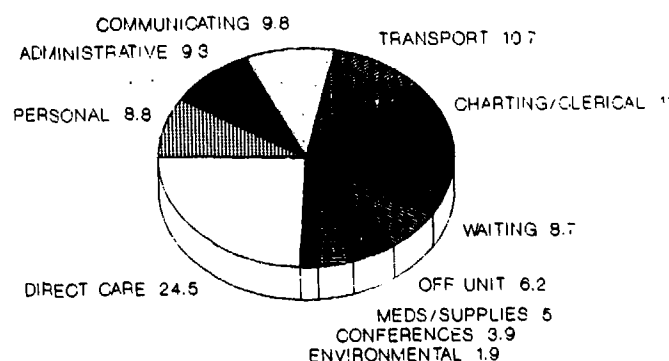


Fig. 1. Percentage of time spent by nursing personnel. (Adapted from Misner TR, Frelin AJ: Time Spent in Indirect Nursing Care. Final Report 83-004.⁴)

TABLE I
WMSN—CATEGORIES OF CARE

Category	Point Range	Care Description
I	0-12	Self care/minimal care
II	13-31	Moderate care
III	32-63	Acute care (1 staff: 3-5 patients)
IV	64-95	Intensive care (1 staff: 2 patients)
V	96-145	Continuous care (1 staff: 1 patient)
VI	146→	Critical care (> 1 staff: 1 patient)

mal care, to 6, representing critical care, with varying staff requirements for each category (Table I).⁵

The total number of patients in each of the six categories is plotted against a chart which projects total nursing care hour requirements. This number is entered in the personnel requirement table, which projects a recommended number and mix of staff required to provide direct and indirect nursing care for the next 24 hours. The current system can be used manually, or as an automated system.

In early 1988, a project was initiated to determine if the WMSN was valid and reliable in determining staffing requirements for critical and acute burn care units. A panel of seven burn nurses evaluated each indicator on the WMSN classification tool and concluded that all indicators except for "dressings" are valid for the care of burn patients.

Even with advances in wound care techniques, the application of burn wound dressing consumes a large quantity of nursing time. The WMSN includes dressings under the group of treatments/procedures/medications, but all dressings are identified as either simple or complex. WMSN defines a simple dressing procedure as taking 5 to 7 minutes to complete and being changed two times in a 24-hour period. The simple dressing carries a point value of 2. The complex dressing requires 30 minutes of nursing time once a day and is worth 4 points. (Each point represents 7.5 minutes of direct nursing care time.)

The original studies measured direct time required for dressing application in a variety of clinical areas but excluded burn units. Patients with burn injuries present a specific challenge concerning wound management. Burn wounds may be isolated to one specific area or involve a significant portion of the body. The large diversity of dressings required for burn wound care led to the speculation that burn wound dressings should be considered as a separate indicator for patient classification. Therefore, a descriptive study was undertaken to measure objectively the time spent by nursing personnel on the application of dressings to burn wounds. The findings will establish the mean essential tasking times for application of burn dressings to wounds on various parts of the body. Results of the study will validate actual nursing care time requirements for burn wound dressings which can be combined with the established indicators to provide accurate WMSN data for determining staffing requirements.

Definition of Terms

Critical Indicator: Nursing activities on the WMSN classification instrument which have the greatest impact on direct care time.⁵

Points: Number assigned to a specific critical indicator based on documented time and motion studies. Each point is equal to 7.5 minutes of direct nursing time.⁶

Mean Essential Task Time: Calculated mean including all time measurements within the 95% confidence interval.⁷

Burn Dressing Change: Includes the time to remove soiled dressing material to include splints, don clean gloves, assess the wound, and apply dressing material.

Method

The U.S. Army Institute of Surgical Research is a 16-bed critical care and a 24-bed acute care burn unit in southwest Texas. The units were selected to provide a representative sample of patients with burn injuries requiring routine burn dressings. During 1989, the average daily census of the critical care unit was 9 patients while the acute care unit averaged 15.

For study purposes, the body was divided into six anatomical regions: head/face, hand/foot, upper extremity (excluding hand), chest/abdomen, back/buttock, and lower extremity (excluding foot). The investigators developed and tested the data collection sheet. To insure ease of use and clear definitions, minor modifications in the tool were made. The method of data collection was work sampling, a technique reported by Abdallah and Levine in 1954.⁹ The two investigators were nonparticipants in the procedures, observing nurses complete routine burn dressing changes of specific body parts. Nursing personnel were assured that they were not being individually evaluated, and that the data were part of composite findings. Nursing staff quickly adjusted to the observers and it is felt that modifications of behaviors were minimal.

Data collection occurred during the day and evening shifts between the months of February and May 1989. Observations were made using a convenience sample of patients admitted either to the acute care or critical care burn unit. Using a work sampling technique, measurements were collected on routine

TABLE II
NURSING TIME IN MINUTES TO COMPLETE
DRESSING APPLICATIONS

Body region	Range	Median	Mean	N
Head/face	9.57-25.98	9.33	10.64	40
Hand/foot	1.55-17.22	7.43	7.66	48
Upper extremity	1.15-20.37	3.84	6.55	53
Chest/abdomen	0.61-29.72	5.43	7.37	37
Back/buttock	1.68-59.48	9.35	14.42	30
Lower extremity	1.45-28.50	7.03	8.59	103

burn dressing applications encompassing 311 separate body parts on 37 individuals (32 males and 5 females). The patients included had total body surface area injuries ranging from 1 to 81% ($\bar{x}$ = 33%). Patient age ranged from 18 to 88 years ($\bar{x}$ = 35). A variety of nursing staff (RN/LPN) with differing levels of expertise in burn nursing applied the dressings. There were no controls for variables, which included treatments occurring during the dressing applications. Such treatments included mechanical ventilation, therapeutic beds, hemodynamic monitoring, and administration of a variety of pharmaceutical preparations.

Before data collection, the two investigators simultaneously timed staff members completing dressing applications on 15 individuals. Interrater reliability was established at 0.985.

Results

The data in Table II represent the direct nursing time reported in minutes to complete the dressing applications.

Discussion

The dressing applications observed during this study are similar to those applied throughout the burn unit. The patients on whom the dressings were applied mirror the general population of admissions to these units. The findings suggest that the amount of time required to complete the application of routine dressings for burn wound management is different from the dressing time measured in previous studies for WMSN. In this sample, the mean number of body parts dressed per patient is 1.91, requiring an average total nursing time of 19.34 minutes. The average nursing time cannot be generalized because the number of body parts involved varies depending on the location and percentage of body surface area burned.

The advantage of using a measurement system based on body region is that staff members can project the time requirements for dressing applications dependent on the wound location. The time required for specific body regions has been converted to points using the standard of 7.5 minutes equals 1 point. The point value is multiplied by the number of changes per 24 hours. This method allows accurate reporting of projected nursing care requirements for burn wound dressings. This study measures what is and not what should be. No attempt was made to indicate quality of care, only the time spent to apply dressings.

Data were gathered but not reported on patients undergoing

initial and second post-operative dressing changes. In these units, the first or second post-operative dressing are limited, averaging two to six per day. These dressings are labor-intensive, requiring multiple staff members from both the nursing and medical staff. These dressings appear to present different staffing requirements because of concern about disrupting the fragile skin grafts. Patients may also have limited ability to independently keep body parts elevated or positioned during these procedures. The second post-operative dressing change is significant for the removal of skin staples which secure the skin grafts in place. If a patient undergoes excision and grafting of 20% body surface area, it is estimated that 800 staples may be used to secure the grafts. Staples are usually removed during the second post-operative dressing change. These procedures increase time requirements for both the nursing and medical staff. Not enough data are available for all body part groupings to support conclusions. It is suggested that a staff nurse performing an initial or second post-operative dressing measure the time required to complete these dressings. This time can be converted using the 7.5 minutes equals 1 point and documented as a complex dressing. Plans are underway to complete data collection on these categories of dressings.

Conclusion

The findings suggest that the amount of time required to complete the application of routine dressings for burn wound management is different from the dressing time measured in previous studies for WMSN. If nurse managers are to make sound judgments about staffing and cost containment, they must measure nursing care activities appropriate to their patient population. Patients with burn wounds present a unique population which requires special wound management. Therefore, "burn dressings" must be included as a critical indicator for patient classification in burn units. The staff have been trained to use the various body group dressing application data on the WMSN classification tool accurately. Based on data collected in this study, more accurate nursing care requirements for wound care can be collected. The findings of this study were implemented in the WMSN data collection at this agency beginning in January 1990. In order to assess the importance and usefulness of the change on nursing care hour requirements utilizing the burn wound indicator, the predicted nursing personnel needs during 1990 will be compared to those of 1989.

Acknowledgments

Three individuals require special acknowledgment: W. Emery, R.N., for data collection; COL N.C. Molter, AN, for ongoing consultation and guidance; and A.D. Mason Jr., M.D., for consultation on statistical analysis.

References

1. Helmer FT, Reig L, Winkler J, et al: Development of a patient classification system for burn units—a case study. *J Burn Care Rehabil* 8:117-123, 1987
2. Sherrod SM: Nursing Care Hours Standards Study. Technical Report, HCSD Report 81-009 Part 1. Alexandria, Va. Defense Technical Information Center. Defense Logistics Agency, 1981

3. Sherrod SM, Rauch TM, Twist PA: Nursing Care Hours Standards Study: Part VIII—Executive Summary. Health Care Studies Division. Academy of Health Sciences, Fort Sam Houston, Texas, 1981, pp 1-8
4. Misner TR, Frelin AJ: Time Spent in Indirect Nursing Care. Final Report 83-004. US Department of Commerce, National Technical Information Services, Springfield, Va, 1983, pp 1-18
5. Reider KA, Lensing SB: Nursing productivity: evolution of a systems model. Nursing Management 18:33-44, 1987
6. Vail JD, Norton Da, Reider KA: Workload management system highlights staffing needs. Nursing Health Care 8:289-293, 1987
7. Reider KA, Vail JD, Norton D, et al: Workload Management System for Nurses Educational Workbook. Workload Management System for Nurses, Falls Church, Va, 1984
8. Lake WH: Nursing Staffing Based on Patient Classification. IMS, Inc. Rockville, Md, 1982
9. Abdellah F, Levine G: Work sampling applied to the study of nursing personnel. Nurs Res 3:11-16, 1954



Accession For	
NTIS GRA&I	☒
DTIC TAB	☐
Unannounced	☐
Justification	
By _____	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	20