Patient nutrition acuity as a predictor of the time required to perform medical nutrition therapy

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ABSTRACT

Objective To determine if patient nutrition acuity accurately predicts the time required to perform medical nutrition therapy (MNT).
Design Data detailing demographic characteristics, patient nutrition acuity, and time spent performing MNT were collected for 12 consecutive days. Random systematic sampling was used to select 25%, or a minimum of 20 patients, from daily admissions to the hospital. Nutrition acuity was categorized using a 27-item patient acuity tool.
Subjects/setting Analysis included data from 92 acute-care hospitals nationwide; the median census was 271 patients. Of the 7,289 patients in the survey, 3,321 were included in this data analysis. All subjects were assigned an acuity rating and received MNT. Mean age (±standard deviation [SD]), was 55±24 years, and the sample was 48% male and 52% female. Time spent delivering MNT ranged from 5 to 285 minutes (mean±SD=43.3±34.2 minutes).
Statistical analyses performed Stepwise multiple regression analysis ($P<.05$), with independent variables of age, gender, and 27 acuity descriptors, determined time required to perform MNT.
Results The number of acuity descriptors assigned to patients ranged from zero (53 patients) to 20 (1 patient); the mean (±SD) for all patients was 5.6±3.1. Gender and 21 of the 27 acuity descriptors were statistically significant in predicting the time required to perform MNT.
Applications/conclusions A formula was developed to determine medical nutrition therapy time (MNTT) as minutes per patient sampled. When extrapolated to a facility's patient census, MNTT is the basis for predicting staffing requirements. The MNTT formula is crucial in the present environment of managed care where fiscal accountability challenges staffing rationales. *J Am Diet Assoc. 1999;99:1367-1372.*

Hospital administrators, physicians, consumers, and board members responsible for the overall policies governing hospitals, all share in the concern about...staffing and its relation to the spiraling costs of health services, the desired efficiency of the staff, and the rendering of health care which is acceptable in quality and therapeutic in its effect" (1, p 3). This statement, made in 1973 by Myrtle K. Aydelotte in the introduction to her landmark publication, *Nurse Staffing Methodology: A Review and Critique of Selected Literature* (1), is even more pertinent today. Since 1985, there has been a "20% real increase in the activity of the inpatient hospital population and a 12% decrease in the length of hospital stay" (2, p 13). Reorganization or downsizing was identified as the "hottest trend" in hospitals in the early 1990s, which adds more pressure to increase the efficacy and efficiency of staff (3). By 1993, to meet these demands, patient acuity (ie, classification of patients by needs) had become a tool used in nursing to forecast staffing and manage costs appropriately (3).

Clinical nutrition managers have had no such tool. Dietitians began to address their job responsibilities and staffing as early as the 1950s (4) and by 1972 a staffing methodology for acute care was postulated. Patient needs were classified by type of diet ordered and type of dietary service that ensued. This system did not remain a satisfactory method because newer approaches reflected patient need for the service of medical nutrition therapy (MNT), independent of the diet ordered.

The evolving focus on MNT was evidenced in staffing efforts. As early as 1972, clinical managers began to use subspecialists, such as dietetic technicians, to free dietitian time (5-9). Use of subspecialists led to an examination of workload and productivity (10-13) and ultimately to a productivity management model developed by The American Dietetic Association Productivity Task Force (14). By 1984, the prediction of staffing needs was based on evaluation of patients' nutritional status and medical diagnoses (7,15-18). Another approach was to assign amounts of time for specific MNT activities (5,6,11-13,17-19). Other staffing methods were based on patient nutrition care requirements (19,20), existing staffing ratios (21,22), and nutritional risk classification of patients (23). Despite these efforts, no methodology has evolved to effectively predict clinical nutrition staffing needs. As recently as 1994, clinical care continued to be relegated to a short chapter in management texts and staffing models were absent (24).

Two issues have hindered the development of an effective staffing model in clinical dietetics: a focus on the individual

Editors' note: *The MNTT formula is limited in that it is based on data collected in the early 1990s. The practice of clinical nutrition in acute care has changed. The formula, as presented, predicts direct patient care time only.*

When determining total staffing requirements, nondirect patient care time, such as team interaction, performance improvement activities, and other clinical responsibilities, should be included.

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Table 1
Descriptors of the Patient Acuity Tool[a]

Factor	Descriptors	Explanation and examples
Physical status	1. Age category	<2 y or ≥65 y
	2. Weight profile	Intentional or unintentional weight loss or weight gain; overweight; underweight; poor growth
	3. Partial or complete immobility	Evaluation for decubitus ulcers and bone demineralization; requires alternative anthropometric measurements; needs assistance with feeding or needs eating devices
Neurologic status	4. Unconscious	Unresponsive. If checked, exclude descriptors 5, 6, and 21.
	5. Alteration in mental status	Confusion or disorientation; dementia; psychological impairment
	6. Sensory deficit or communication barrier	Uncompensated or impaired vision, hearing, speech; language barrier
Feeding status	7. Special food needs	Allergies; anorexia; multiple food preferences or restrictions; cultural or religious needs; need for oral supplements
	8. Feeding method: tube feeding	Requirement or potential requirement for tube feeding; receiving tube feeding; changing from tube feeding to intake by mouth
	9. Feeding method: parenteral feeding	Requirement or potential requirement for parenteral feeding; receiving parenteral feeding; changing from parenteral feeding to tube feeding or intake by mouth
	10. Need for nutrient intake analysis (limited)	Requirement or potential requirement for calculation of intake by mouth or tube feeding or requirement for any one nutrient or combination of nutrients
	11. Need for nutrient intake analysis (comprehensive)	Requires calculation of intake by mouth, tube feeding, parenteral feeding, kilocalorie count or any combination of these; micronutrient analysis; nitrogen balance
Biochemical status	12. Need for laboratory data evaluation (limited)	Requires interpretation of laboratory values
	13. Need for laboratory data evaluation (comprehensive)	Requires in-depth analysis of laboratory values
	14. Need for evaluation of energy requirements	Requires calculation of basal energy expenditure or indirect calorimetry
	15. Alteration in fluid balance status	Dehydration, overhydration, edema, ascites, need to monitor intake and output
Review of systems	16. Alteration in immune status	Neutropenic precautions; transplantation; chemotherapy; radiation therapy; immune deficiency disorder
	17. Alteration in gastrointestinal status	Malabsorption; gastrointestinal intolerance; pharyngitis; esophagitis; nausea; vomiting; diarrhea; constipation; at risk for aspiration; high gastric residuals
	18. Alteration in skin integrity	Decubitus ulcers; dermatologic signs of nutrient deficit; delayed wound healing; burns; cellulitis; other skin infections
	19. Alteration in respiratory status	Dependent on ventilator or supplemental oxygen; abnormal oxygen and/or carbon dioxide values; respiratory alkalosis or acidosis; tracheotomy tube
	20. Alteration in hemodynamic status	Fever, arterial hypertension, portal hypertension, shock states
	21. Alteration in chewing/swallowing	Dysphagia; chewing and/or swallowing disorders
	22. Multiple systems instability	Trauma; recent transplant; severe fluid or electrolyte imbalance with accompanying renal or hepatic compromise
Counseling and education	23. Procedure-related counseling	Patient and/or significant others require explanation related to a test or procedure (before or after procedure)
	24. Need for nutrition counseling (limited)	Patient and/or significant others require less than 30 minutes of counseling and education secondary to diagnosis or lifestyle changes; drug-nutrient interaction counseling
	25. Need for nutrition counseling (comprehensive)	Patient and/or significant others require in-depth counseling and education requiring multiple sessions; structured educational program
	26. Special emotional needs	Eating disorder (anorexia nervosa, obesity); decision to continue or discontinue nutrition support; newly diagnosed chronic disease or metabolic or genetic nutrition disorder; nutrition support for terminally ill
	27. Need for discharge planning	Documented discharge plan for nutrition care (including hospital outpatient service or other care facility)

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patient rather than on a hospital's total patient population and the inability to measure the service of MNT. A population-focused patient classification system that addressed patients' nutritional needs was missing—a tool that could describe the MNT acuity of the patient population and link it to time necessary for delivery of the therapy. The Clinical Nutrition Management dietetic practice group of The American Dietetic Association, with support from Ross Laboratories, developed the Patient Acuity Staffing Study to fill this need (25). The study was implemented in 2 parts: part 1 focused on indirect care, or the dietetics office and routine functions of clinical nutrition practice; part 2 focused on direct care, or the delivery of MNT. Part 2, which was the basis for the current staffing research, addressed the issue of a patient acuity tool to describe MNT and link it to the time spent delivering MNT. Analysis of the data yielded the medical nutrition therapy time (MNTT) formula, to our knowledge the first tool of its kind designed to predict MNT time for a patient population (26).

METHODS

Patient Acuity Tool

Clinical nutrition departments from across the country were asked to volunteer for the Patient Acuity Study so that a cross section of types and sizes of hospitals would be included. Nationwide, facilities ranged from county to university hospi-

Table 2
Medical nutrition therapy (MNT) delivery time[a]

Activity	Day 1 (date)[b]	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Activity total time
	← minutes →								
Initial patient classification[c]		10							10
Intervention and documentation[d]			15	5					20
Nutrient intake analysis[e]				15					15
Nutrition counseling[f]					25				25
Discharge planning[g]							10		10
Reclassification, day 8[h]									0
Subtotals (min)	0	10	15	20	25	0	10	0	
Grand total (min)									80

[a]Copyright [e]Clinical Nutrition Management dietetic practice group, The American Dietetic Association, December 1990.
[b]Day of admission is always day 1. For each day, the date is added.
[c]Time for completion of patient classification data, time record, and day 1 acuity score; patient is evaluated visually but not provided with MNT.
[d]Includes patient charting and care plan evaluations.
[e]Includes kilocalorie counts, parenteral and enteral feeding evaluations, and documentation.
[f]Includes preparation and delivery of patient and/or care provider education and documentation.
[g]Individual patient planning, including follow-up provider interactions and documentation. Unit discharge planning activities are not included.
[h]Time for complete patient reclassification for patients still available; all initial patient classification criteria apply.

tals. Data were collected on 7,289 patients; newborns were excluded. The Patient Acuity Tool, described in Table 1, was validated using the equivalence method of interrater reliability. Construct validity was based on similar research in nursing and social work services. Content validity was the result of the expertise of the authors, and face validity was confirmed during initial testing and subsequent application in the field.

Registered dietitians subjected the acuity tool to test-retest reliability, then collected the data. At each facility, systematic random sampling was used to select 25% of daily admissions to the hospital, or a minimum of 20 patients. A patient chosen but discharged within 24 hours of admission was excluded and replaced by a patient who had been admitted on the original selection day. Patient data were collected for a maximum of 8 days or until the patient was discharged or died.

The 27-item Patient Acuity Tool was used to evaluate patient nutrition acuity at the time of admission. As shown in Table 2, which describes what patient data need to be collected on which days, all subsequent MNT delivery time was recorded in 5-minute intervals throughout the patient's stay. For our study, only total time spent delivering MNT was recorded, although the original data were categorized by time and activity. Because individual MNT activities were not uniquely defined, they were meaningless as separate data subcategories.

Study Population

Only patients who received at least a minimum of MNT (initial screening evaluation), or 46% of the Patient Acuity Study participants (N=7,289), were considered in this analysis (n=3,321). Patients (54%) were excluded from this analysis if they did not receive initial evaluation, if they resided in non–acute-care units, or if data were inaccurate. For 1,201 of the patients who did not receive MNT, there were 28 statements in this study to select from to describe why the patient did not receive care. Selections included length of stay less than 24 hours, lack of a physician order for MNT, and patient discharged before becoming a priority for the dietitian.

MNTT Data Analysis

The objective of this research was to determine if patient MNT acuity could accurately predict MNTT. The hypothesis tested was that age, gender, and 27 acuity descriptors could predict MNTT. Multiple regression ($P<.05$) with stepwise entry and removal was used. The statistical significance of each independent variable was assessed by means of the Student t test (2-tailed distribution) and the dependent variable, MNTT, was subjected to a logarithmic (base 10) transformation. The adjusted R^2, rather than the R^2, was reported for the measure of goodness of fit for the model, as it more accurately reflected the inclusion of the large number of variables.

RESULTS

Patient and Hospital Demographics

The MNTT analysis was based on the 3,321 patients who were eligible to receive MNT. Patient assessment with the Patient Acuity Tool resulted in the use of descriptors in a range of zero (53 patients) to 20 (1 patient); mean±standard deviation (SD) for all patients was 5.6±3.1. Total time for providing MNT to a patient during the study (maximum of 8 days of hospitalization) ranged from 5 to 285 minutes; the mean±SD was 43.3±34 minutes.

Of the 92 participating hospitals, median capacity was 395 licensed beds (range=75 to 1,200) and daily median census was 271 patients (range=30 to 820). Thirty-four percent of patients had a length of stay 7 days or longer; 65% had a length of stay less than 7 days; 1% died. Patient distribution in specific care units appeared to approximate the distribution of typical hospitals; that is, 3% were in critical care, 9% in intensive care, and so on. Median ratios of full-time equivalent staff to patients were as follows: clinical nutrition manager, 1:271; inpatient dietitian, 1:60; and dietetic technician, 1:151. The mean (±SD) patient age was 55±24 years; 1,876 (56%) were younger than 64 years. The gender distribution was 48% male and 52% female.

Table 3
Significant predictors of medical nutrition therapy time for 3,321 subjects[a]

Variables	b[b]	SE[c]	P[d]
Gender	0.036	0.10	.0002
Physical status			
1. Age	0.022	0.010	.0279
Neurologic status			
4. Unconscious	0.083	0.031	.0073
5. Alteration in mental status	0.041	0.017	.0134
6. Sensory deficit or communication barrier	0.049	0.016	.0022
Feeding status			
7. Special food needs	0.054	0.010	<.0001
9. Feeding method: parenteral feeding	0.047	0.022	.0340
10. Need for nutrient intake analysis (limited)	0.074	0.013	<.0001
11. Need for nutrient intake analysis (comprehensive)	0.131	0.028	<.0001
Biochemical status			
12. Need for laboratory data evaluation (limited)	0.095	0.013	<.0001
13. Need for laboratory data evaluation (comprehensive)	0.123	0.017	<.0001
14. Need for evaluation of energy requirements	0.106	0.011	<.0001
15. Alteration in fluid balance status	0.024	0.012	.0468
Review of systems			
16. Alteration in immune status	0.040	0.015	.0096
17. Alteration in gastrointestinal status	0.053	0.011	<.0001
18. Alteration in skin integrity	0.085	0.018	<.0001
19. Alteration in respiratory status	0.065	0.015	<.0001
21. Alteration in chewing/swallowing	0.044	0.016	.0067
22. Multiple systems instability	0.086	0.022	.0001
Counseling and education			
23. Procedure-related counseling	0.121	0.024	<.0001
24. Need for nutrition counseling (limited)	0.104	0.011	<.0001
25. Need for nutrition counseling (comprehensive)	0.211	0.016	<.0001
Constant[e]	1.175	0.014	<.0001

[a]Adjusted R^2=0.30.
[b]b=Regression coefficient.
[c]SE=standard error.
[d]P<.05, based on Student t test. Results are rounded to 4 decimal places.
[e]Initial classification time.

Patient Acuity Tool Descriptors

The 4 Patient Acuity Tool descriptors most frequently identified were need for laboratory data evaluation (limited) (72%); weight change (56%); special food needs (48%); and age younger than 2 years or older than 65 years (46%). The 4 descriptors with the strongest prediction for MNTT were need for nutrition counseling (comprehensive), b=0.211; need for nutrient intake analysis (comprehensive), b=0.131; need for laboratory data evaluation (comprehensive), b=0.123; and procedure-related counseling, b=0.121. Thus, the MNT descriptors that were the strongest predictors of MNTT did not describe the activities most frequently conducted by the dietitians in this study.

Table 3 summarizes the results of the multiple regression analysis of patient acuity on MNTT. Gender and 21 of the 27 Patient Acuity Tool descriptors were found to be significant predictors of MNTT. The resulting MNTT staffing formula, where 1 means the descriptor (D) applied and 0 means it did not, follows: log (MNTT)=1.175+(0.036×1 if male; 0 if female)+(0.022×D1)+(0.083×D4)+(0.041×D5)+(0.049×D6)+(0.054×D7)+(0.047×D9)+(0.074×D10)+(0.131×D11)+(0.095×D12)+(0.123×D13)+(0.106×D14)+(0.024×D15)+(0.040×D16)+(0.053×D17)+ (0.085×D18) + (0.065×D19) + (0.044×D21) + (0.086×D22) + (0.121×D23) + (0.104×D24) + (0.211×D25). The result, log(MNTT), is then converted to minutes ($10^{\log(MNTT)}$).

One might be tempted to treat the coefficients separately and state, for instance, that an older patient requires more MNTT time. Not only is this a misapplication of multiple regression analysis, where all independent variables must be considered for their contribution, but it also leads to an incorrect mathematical operation. Consider a female patient whose evaluation indicated that only descriptor number 1 (age category <2 or ≥65 years) applies. In this hypothetical case the correct solution would be log (MNTT) = $10^{1.175+0.022}$, or 15.74 minutes. Treating the coefficients separately would result in an incorrect mathematical operation: log (MNTT) = $10^{1.175}$+ $10^{0.022}$=14.96+1.05=16.01 minutes.

DISCUSSION

Screening and MNTT

Often screening is used to find patients at nutritional risk and to quantify patient load for staffing purposes. In the approach described by Ford and Fairchild (23), weight and age were 2 of the 7 nutritional risk factors used to classify patients and predict MNT care categories and, thus, MNTT. Foltz et al (27) reported the frequency of several items on screening tools used in the 388 facilities surveyed: weight (86%), recent weight loss (83%), and food intolerance (59%).

The fact that the 4 most frequently used Patient Acuity Tool descriptors in this study (limited laboratory data evaluation, weight change, special food needs, and age) have historically been key items in screening tools, but were not the most significant predictors of MNTT (comprehensive nutrition counseling, comprehensive nutrient intake analysis, comprehensive laboratory data evaluation, and procedure-related counseling) is startling. These findings suggest that current predictors of staffing for MNTT, such as number of patients screened, are inaccurate.

Patient Acuity Tool

The Patient Acuity Tool and resulting MNTT formula provide a powerful new approach for clinical nutrition managers. Nevertheless, the Patient Acuity Tool is not without its shortcomings. The design of the tool may have introduced measurement errors. For example, descriptor 26 (special emotional needs)

Table 4
Application of medical nutrition therapy time (MNTT) formula: full-time equivalent calculations

Facility situation	Census	Length of stay (d)	Total no. annual patients	50% of patients receive MNT	Average MNTT per patient (min)	Total MNTT (h)	Full-time equivalent (FTE) staff needed to provide MNT
Hospital baseline status	271	4.0	24,729	12,365	25	5,152	2.48
Scenario A: hospital changed *managed care contract*; new patient population brings a higher acuity.	271	4.0		12,365			
MNTT for patients lost			6,182		25	2,576	−1.24
MNTT for new patients			6,182		29	2,988	+1.44
Net change in FTE staff							+0.20[a]
Scenario B: length of stay was reduced, patient census was maintained; acuity was unchanged.	271	3.5	28,261	14,131	25	5,888	2.83
Net change in FTE staff							+0.35[b]
Scenario C: patient census and length of stay were reduced; acuity was increased.	225	3.5	23,464	11,732	31	6,062	2.91
Net change in FTE staff							+0.43[c]

[a]416 hours or 10.4 work weeks.
[b]728 hours or 18.2 work weeks.
[c]894 hours or 22.4 work weeks.

overlapped with 5 (alteration in mental status); 7 (special food needs) overlapped with 21 (alteration in chewing/swallowing); and 22 (multiple systems instability) overlapped with 16 through 20, which listed individual systems.

In descriptor 4 (unconscious), an attempt was made to address the issue of overlap. Inclusion of this descriptor, precluded use of 5 (alteration in mental status), 6 (sensory deficit or communication barrier), and 21 (alteration in chewing/swallowing). However, mandatory exclusion of these variables resulted in an unequal weighting of the remaining descriptors. If descriptor 4 was used, there were 23 descriptors from which to choose; if descriptor 4 was not used, there were 26 descriptors from which to choose.

These shortcomings do not imply that further studies should incorporate greater detail into the Patient Acuity Tool; rather, clarification and simplification of the tool are necessary. As evidenced in nursing, increased specificity of the variables describing patients, activities, unit, or facility often defeats the goal of having an easily used tool (3).

Criticisms of Elements of Care MNTT Model

Although the measurement in the MNTT model involved only services and not tasks, it was essentially an elements of care model: services were described and patients were rated in accordance with their need for those services. In the nursing literature several criticisms have been made of an elements of care model of patient classification (28,29), and they provide a useful framework for the current discussion.

Criticisms of the elements of care model included the fact that some services (activities) were not listed in the model and that the issue of the differentiation of staff could not be resolved. In our study, services were not detailed in an attempt to include every possibility. Instead, the Patient Acuity Tool quantified MNT as services defined by broad descriptions related to patient acuity (Table 1). The resulting MNTT model yielded the ability to describe a specific patient in 4,194,304 ways (2^{22}), thereby ensuring that a heterogeneous patient population could be assessed.

Differentiation of staff was also intentionally avoided in our study. Protocols regarding the appropriate use of dietetic technicians, registered vs registered dietitians are not universal; therefore, the distinction is not useful in a staffing model that attempts to predict total MNTT. The roles of these professionals in the delivery of specific MNT are appropriately left to the discretion of the clinical nutrition manager.

Another criticism of an elements of care model is that it assesses the care needed not the care received. Our study was able to link these important issues in a meaningful way. The Patient Acuity Tool was designed to assess the nutrition care needed by the patient as observed at initial classification. The resulting analysis then linked the acuity to the care received as measured by MNTT. Because the MNTT formula was developed in actual care-delivery settings, it reflects the time required to deliver appropriate hospital-based MNT.

Predictive Validity of MNTT Formula

As noted by Edwardson and Giovannetti (30, p 116), "if the purpose of workload measurement is to forecast workload for some time in the future, then the most important evidence of validity is predictive validity." Predictive validity for the Patient Acuity Tool would have involved a comparison of the results of the study with a concurrent activity/time study; however, measuring the service of MNT is not as clear-cut and simple as measuring an activity. In addition, published studies involving MNT activities are difficult to use as a baseline because the named activities vary in content.

Screening, however, can be used to illustrate predictive validity of the Patient Acuity Tool. The activity of initial patient classification can be compared with screening or initial assessment. Results of the MNTT analysis yielded a mean (±SD) of 11.9±6.2 minutes for initial patient classification. Previous research has reported similar figures: Frey and Littleton (7) reported a time of 5 to 7 minutes per patient for initial patient classification; McManners and Barina (13) estimated time for initial chart review at 5 minutes and patient interview at 5 minutes; and Shanklin et al (19) estimated preliminary screen-

ing at 10.5±10.0 minutes, depending on the level of care of the patient.

Because of the issues of service/time measurement and patient individuality, the MNTT formula was not intended as a model to predict daily MNTT for individual patients.

APPLICATIONS

- Staffing time for MNT has not been as predictable as staffing time needed for nursing. Nursing appears to have more activities that are needed by virtually all patients. Therefore, nursing staffing models rely in part on patient census and on other medically related variables. Unlike nursing care, not all patients require MNT.
- No method has been available to predict MNT needs of a patient population based on existing indicators such as patient census, type of medical procedure, or disease/diagnosis. Clinical nutrition managers have had to determine staff needs based on a variety of approaches that rely solely on current or past patient care history. This means that if the department is currently understaffed, staffing plans will not reflect the needs of that portion of the patient population that may have needed MNT but were unable to receive it. The MNTT formula allows the manager to take a random sample of patients admitted to the hospital, establish the average MNTT per patient, and predict the time and full-time equivalent staff that will be required.
- Table 4 demonstrates the application of the MNTT formula when environmental conditions have caused the patient census to change. In each scenario, if current approaches such as estimates based on patient census and/or length of stay had been used, MNT staffing would have been maintained or reduced. In contrast, when the MNTT formula was used, the average MNTT per patient predicted a need for increased staffing to maintain quality of care.
- Clinical nutrition managers should also use the MNTT formula to establish the current acuity baseline (and resulting MNTT) of the patient population. Based on annual reassessments, or more frequent assessments as indicated by environmental changes, the MNTT formula will provide the documentation for appropriate changes in MNT staffing levels. Just as the MNTT model is applied at the hospital level, staffing for individual hospital units can also be evaluated.
- The MNTT model provides a mechanism by which staffing levels and resulting patient outcomes, or quality of care, can be linked. The MNTT model focuses only on the patient and MNT and does not include time spent on other duties or responsibilities of the staff. Because of this focus, the staffing and MNTT average for the patient population can be compared without the influence of other issues either within a hospital or between hospitals.
- Health care organizations continue to establish contracts with managed care groups; therefore, hospitals will increase the number of patient days committed to specific patient populations. The MNTT formula is crucial in this environment where fiscal accountability challenges staffing rationales. The clinical nutrition manager must respond in a proactive manner and apply the MNTT staffing model to ensure quality of care through appropriate staffing levels.

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