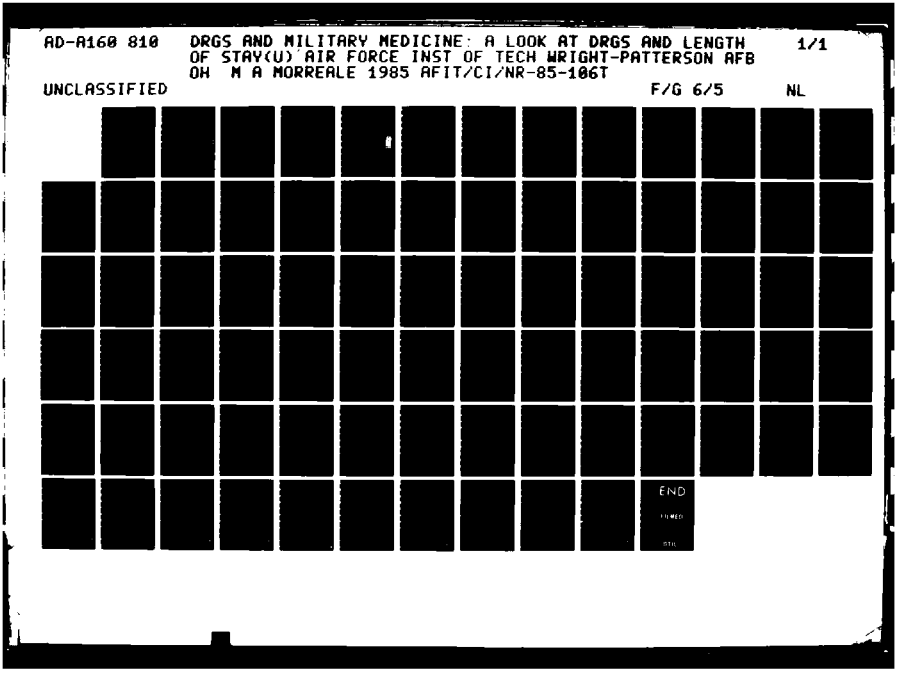
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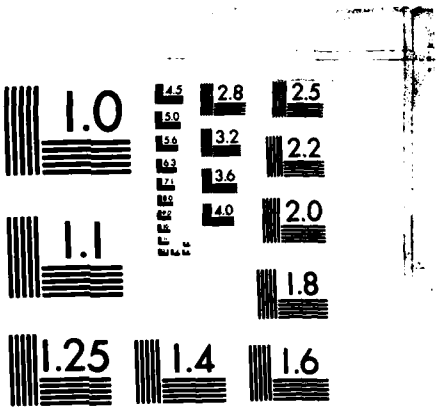

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1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
AFIT/CI/NR 85-106T		

4. TITLE (and Subtitle)	5. TYPE OF REPORT & PERIOD COVERED
DRGs and Military Medicine: A Look at DRGs and Length of Stay	THESIS/DISSERTATION
	6. PERFORMING ORG. REPORT NUMBER

7. AUTHOR(s)	8. CONTRACT OR GRANT NUMBER(s)
Mary Ann Morreale	

9. PERFORMING ORGANIZATION NAME AND ADDRESS	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
AFIT STUDENT AT: Yale University	

11. CONTROLLING OFFICE NAME AND ADDRESS	12. REPORT DATE
AFIT/NR WPAFB OH 45433 - 6583	1985
	13. NUMBER OF PAGES
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)	15. SECURITY CLASS. (of this report)
	UNCLASS
	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

DTIC ELECTE S OCT 30 1985 D

B

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

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DIGEST

This ~~paper~~ thesis is an administrative, exploratory study of Diagnosis Related Groups (DRGs) and their potential use in the military medical service. As such it explores the development and uses of DRGs and examines the results of an analysis of length of stay by DRGs. Data was obtained from a USAF tertiary care facility. Data from existing sources was used but in an uncustomary comparison (for the Armed Services) utilizing Diagnosis Related Groups (DRGs) and the National Hospital Discharge Survey data for comparisons of mean length of stays.

The typical patient in the military sample is a military beneficiary. Only approximately one third of the patients sampled are on active duty status, the mean age of the sample is 36.98 years and half the patients are female.

Patients were selected from 16 services and encompassed 254 DRG categories. Of these DRGs, there were ten DRGs with 20 or more observations which were considered a large enough sample for analysis in this study. A comparison of means, AUTOGRP and SAS ANOVAs were the analytic tools used to explore the data base. Significant results in the comparison were discovered through both AUTOGRP and SAS ANOVAs.

Keywords: hospitalizations; Air Force medical treatment facilities; USAF hospital system; AUTOGRP computer program; analysis of variance; SAS (Statistical Analysis System); financial analysis; computer printouts.

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DRGs AND MILITARY MEDICINE:
A LOOK AT DRGs AND LENGTH OF STAY

BY

MARY ANN MORREALE

Captain, USAF, MSC

SUNY, College of Technology, BPS

An Essay Presented to

The Faculty of the Department of Epidemiology and Public Health

Yale University

In Candidacy for the Degree of Master of Public Health

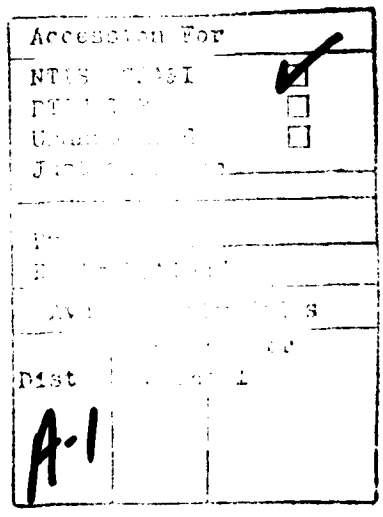
1985

ACKNOWLEDGEMENTS

This study has been accomplished with the help of many people. In particular, appreciation is given to Lieutenant Colonel Charles Bristo, Office of the USAF Surgeon General, who offered the opportunity to access the data base and offered early discussion of potential foci of study. In addition, Major Stuart Baker, USA, Health Services Research Division, contributed significantly in the discussion of results and DRG findings encountered in the US Army investigation of DRGs and military medicine.

Thanks are also tendered to Captain S. Optenberg, Captain S. Fye, and Captain R. Bigelow, who provided early discussion of potential avenues of research on this data base and shared the findings of their own research.

A special thanks is due the many members of the Yale University and staff who contributed of their time and extensive knowledge as this study progressed.



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PART 1

INTRODUCTION

PURPOSE

This exploratory study describes the development of Diagnosis Related Groups (DRGs) and examines their potential for use within the military medical service environment. To this end, this study examines the length of stay (LOS) at a United States Air Force (USAF) medical treatment facility (MTF). This study examines, by DRG, the differences in mean LOS of hospitalizations using two data sets (a military MTF and the National Hospital Discharge Survey, 1981). In addition, ten DRGs with the highest incidence in the military data set have been selected to examine what, if any, particular characteristics within the military population may have a significant impact on the military LOS.

MILITARY MEDICINE

The USAF Medical Service structure is one of staff responsibility between medical organizational levels and line responsibility within the military system. Air Force Regulation (AFR) 168-4 describes the organizational structure of the Medical Service. The Air Force Surgeon General acts as head of the USAF Medical Service and reports directly to the Chief of Staff, USAF. In his function as a staff officer, the Air Force Surgeon General provides technical supervision over all Air Force Medical Service activities. Regulations equivalent to governing by-laws

referred to by the Joint Commission on Accreditation of Hospitals are established by the Office of the Air Force Surgeon General and Headquarters, USAF.

There are six major objectives in the USAF Hospital System. The first objective is to stress operational medical support for the base and community care. The second is to optimize the use of professional, scientific and technical personnel and materials. The third objective involves regionalization of medical care within the continental U.S. (CONUS) depending on facility locations and the service population within the Department of Defense (DoD). The fourth objective addresses the regulating of patients between facilities to provide high quality of care and full use of medical resources. The fifth objective is to expand the postgraduate education program. The last objective encompasses improving the use and control of Medical Board and Physical Evaluation Board systems. (These boards evaluate the medical and physical fitness of active duty Air Force members for continued military service.) [1]

The USAF Hospital System is a regionalized care delivery system comprised of medical treatment facilities of different sizes and capabilities within established geographic boundaries. Each area contains a regional hospital to serve the health care needs within that location. The number and size of the regions are determined based on service population and capabilities of Air Force Meidcal Treatment Facilities (MTFs) within the area. [2]

An area medical center is a large hospital with four major areas of responsibility. It provides the widest range of medical and dental care for beneficiaries. It contains the widest range of specialized and consultative support for other facilities within its region. It provides postgraduate health education and physical evaluation board referral service.

A regional hospital also provides medical and dental care. It contains a smaller range of specialties and consultants and provides physical evaluation board service. [3]

In the interest of meeting the military mission, LOS becomes an important criteria. The sooner patients recover, the sooner they are fit to resume their military duties. Thus, the personnel readiness posture is enhanced.

CASEMIX

Casemix is a term used to describe the degree of case complexity (level of care required) of specific diagnoses and the mix of different diagnoses treated by an institution. The concept of casemix and its effect on resource consumption has been addressed at length. [4,5,6,7,8,9,10]

Any analysis of casemix requires several common factors:

- A common disease classification
- A manageable number of disease categories
- A uniform cost accounting chart and allocation system

-A weighting system identifying the degree of intensity or complexity of care required for comparison purposes.

Klastorin and Watts describe various approaches used to date to aggregate the grouping of diagnoses which is the first step in establishing casemix. Once a diagnostic aggregation method is chosen, appropriate weights must be established and assigned for the different types of cases. To date both the Veterans Administration (VA) (uses New Jersey weights) and the Health Care Financing Administration (HCFA) [11] have established weighting systems to be used with the DRG classification system developed at Yale University. Klastorin and Watts identified that doubt exists that a single set of weights for casemix would be valid for an entire population of hospitals in that functional homogeneity becomes questionable. It would behoove any organization to examine closely any weighting system it might contemplate implementing for comparison usage. [12,13]

DIAGNOSIS RELATED GROUPS

Several factors influenced the developement of DRGs. In the 1970's there was increasing concern over utilization of hospital care and rising health care costs. During this time, it was difficult to obtain case specific costs. Due to the lack of uniformity in cost accounting, inadequate comparisons across institutions were accomplished using averages. The development of DRGs offered an industrial quality control approach to managing a hospital and a way of

defining the products of a hospital.

In defining the concept of product lines in the hospital one must think in terms of hospital inputs and outputs. Hospital inputs in this case being defined as personnel and logistics. Outputs include such items as specific tests and procedures, use of facilities, nursing care and other services provided in the care of patients. The hospital "product" therefore can be defined as the group of services or outputs provided to each patient. A "product" thus is established for each patient making the hospital a multiproduct institution. It is important to note, however, that although each patient's care is unique, certain groups of patients have common characteristics and predictions can be made as to the amount and types of resources which will be consumed in the patient care process. There are two factors within an institution which have a major effect upon the consumption of resources: The efficiency and the effectiveness of hospital operations. [14]

The development of DRGs, therefore, centered around identifying cases using similar resources. Since there is a known correlation between LOS and cost of care [15], the dependent variable was established as LOS. Certain variables were used to define DRGs. Principle diagnosis, operating room procedures, comorbidities and complications, age and discharge status were found to effect LOS and where applicable were used to establish diagnostic groups. Because DRGs classify cases with similar resource

consumption, they essentially define the products of the hospital. The medical perspective was maintained both in the devlopment of DRGs and the definition of Major Diagnostic Categories (MDCs) which were established using physician consultation. The MDCs were created using major organ groups which paralleled medical specialty practice areas as the initial delineation. The MDCs were then divided into surgical versus medical cases and then further divided into diagnostic categories which retained medical integrity. [16]

The DRG classification method contains a manageable number of diagnostic groups for analysis purposes, a total ot 467 distinct, mutually exclusive classes. The DRGs are based on information normally collected on patient abstracts and bills and therefore, the data is readily available. Each group has a statistically stable distribution of length of stay and in addition, each group can be interpreted from a medical perspective.

DRGs function as a management tool in that with proper costing they provide useful data for decision-making. DRGs have four major functions:

(1) They offer an objective method for utilization review.

(2) They can be used as a financial tool for cost containment, resource allocation and reimbursement. [17]

(3) They can be used to evaluate comparative productivity within and between institutions.

(4) They can be used in the selection of various types of samples for quality control.

UTILIZATION REVIEW

Utilization review can be enhanced though the use of DRGs. Patterns of service use (medical, surgical, obstetrics, etc.) can be established. Variables (LOS, ancillary service use, procedures initiated, frequency of DRG occurrence) considered important to management can be analysed by provider and by service. This information also becomes important data for use by Quality Assurance and Risk Management committees. Profiles of provider practice and their impact on the specialty service and institution can be developed. Trends can then be analyzed to determine the need for expansion/reduction or redirection of services within a service. This information in conjunction with needs assessments then becomes an integral part of the planning process.

FINANCIAL ANALYSIS

The information developed from the improved utilization review can be used in the financial analysis and planning role as well. Identification of DRGs which are costly allows review of the care process and the need to investigate other options for care. A costly DRG can be considered one which:

(1) Occurs infrequently but requires very high levels of resource consumption.

(2) Occurs frequently but the level of resource

consumption includes unnecessary use of resources.

(3) Has a longer than necessary LOS which increases resource consumption, and increases the risk of iatrogenic disease (and thus additional resource consumption).

With assistance from the Chiefs of Services and other appropriate medical and management staff, management procedures, provider practice patterns and the associated costs can be evaluated by DRG using cost effective analysis. In addition, trends in practice patterns can be identified and used in forecasting models to anticipate future facility changes, equipment needs, staffing, etc.

Thompson et al. state "It is felt that future application of case-mix cost-accounting will permit new insights into (1) cost finding (2) cost projection (3) cost control (4) charging policies (5) reimbursement policies." [18]

PRODUCTIVITY

In the same way that defining the product enhances utilization review and financial management, DRGs offer a method of evaluating productivity. The provider profiles discussed in the section above on utilization review could be effectively used in evaluating productivity by provider and by service. Expectations for performance can be established for both the individual provider and the service. Lindner and Wagner discuss the use of management related groups for effective evaluation of the information provided by DRGs. [19] These management related groups are comprised of hospital managers, medical staff and other

appropriate personnel. Their function would be to analyse the data and improve the productivity of the institution.

SAMPLING FRAME FOR QUALITY STUDIES

Use of DRGs allows analysis of the quality of medical care within an institution. As discussed earlier, the MDCs and DRGs are divided using major organ groups or medical specialties. Since the medical perspective was maintained in the creation of DRGs and MDCs, DRGs are an excellent tool on which to base quality of care studies. The major benefit of DRGs for quality control is the ability to isolate and identify aberrant cases for detailed chart review. Analysis of quality can be accomplished by evaluating the impact and significance of mean LOS, ancillary procedures, surgical procedures, nosocomial rates and incident reports of medical misadventures. Analysis can be done for a specific time period or across time periods to identify trends.

AUTOGRP

One of the tools used to develop DRGs was a computer program called AUTOGRP developed at Yale University. AUTOGRP is a tool which gives its user a good feel for the descriptive statistics of the data base being analysed. AUTOGRP is capable of reviewing a data base and splitting or "classifying" that data base into groups which tend to reduce the unexplained variance in the dependent variable. The user may then obtain details of that split (values of the independent variables within each group, the amount of reduction of unexplained variance, the mean and standard

deviation of the dependent variable and the number of observations for each group). It then becomes the user's responsiblity to determine if the split is functionally or logically useable within the framework of the subject being analysed. The groupings can lead the researcher into investigating interesting results in more details that might otherwise be overlooked.

AUTOGRP provides a quick, easily learned and used method of learning about a data base. The interactive program allows the user to investigate the effects of independent variables on the dependent variable. In addition, the dependent variable within the data base can be changed quickly for additional information.

PART 2

THE STUDY

The data for this study was developed by the staff of a USAF tertiary facility for internal management use. [20] This facility is one of the largest medical treatment facilities (MTFs) in the USAF and is designated as an area medical center and a regional MTF which treats local beneficiaries as well as patients received through the aeromedical evacuation system.

METHODOLOGY

The following methodology is quoted from the original military facility study:

" The sample consisted of 1323 patient records sampled from 16 services which reflected the major inpatient services at ---- for FY 82. The only major service not sampled was obstetrics. Unique military codes added to the diagnosis codes within this service made sample selection difficult.

The source for the sample was the Medical Administrative Management System Revised (MAMSR). MAMSR was the automated patient registration system used by selected Air Force medical facilities during the study period. This system included individual patient information with regard to: (1) service of discharge; (2) diagnoses and procedures; (3) length of stay; (4) beneficiary type; (5) patient referral status; and (6) treating physician. Using historical MAMSR data, two stage proportional sampling was used. Initially, a target sample size of 1330 cases was established. Sample size was based on service diagnostic variability as well as the cost estimate for recoding records.

In the first stage, the number of records to be sampled from each of the sixteen services was determined using the following formula:

$$\frac{\text{Number of Dispositions in Service}_i}{\text{Total Dispositions of Study Services}} \times \text{Target Sample Size}$$

Where: $Service_i$ = Each of the 16 services analyzed.

In the second stage the number of individual diagnoses to be sampled from each service was determined using the following formula:

$$\frac{\text{Number of Diagnosis}_j \text{ in Service}_i}{\text{Total Dispositions in Service}_i} \times \text{Service}_i \text{ Sample Size}$$

Where: $Diagnosis_j$ = each diagnosis in $Service_i$.

After the number of cases required for each diagnosis within a service was determined, the cases were randomly selected from each diagnosis.

Upon completion of the sample selection, the 1323 patient records were retrieved. The records were then manually recoded from ICD-9 (ICD-9 is currently used by DoD) to ICD-9-CM codes. To insure accuracy of recoding, each record was reviewed by a supervisor. After conversion to ICD-9-CM codes, Health Systems International (HSI) DRG Grouper Tape (August 1983 edition) was used to obtain the DRG classification.

All but 59 records were successfully grouped to DRG. Failure to group these 59 records was due to a programming error in age computation for patients under one year of age. Once age corrections were made these remaining records were manually grouped using HSI Revised ICD-9-CM DRG Manual." [21]

Note: Dispositions = Cases

There are three research questions in this study: one primary question and two secondary questions. These research questions are:

(1) Primary Question: Can DRGs be used in the Air Force Medical Service?

(2) Secondary Questions:

(a) Do the mean lengths of stay by DRG in the military data set approximate the mean lengths of stay by DRG in the National Hospital Discharge Survey data set for the same time period?

(b) Are there selected variables which impact

significantly on the military length of stay by DRG?

There were a number of reasons why these questions were addressed in this study. DRGs are currently being used in the civilian workplace (with only a few exceptions) as a management and reimbursement tool. Any comparisons of military medical care to civilian medical care would need to have a common base, such as DRGs. Because DRGs identify hospital "products" that use similar resources, DRGs offer management a more definitive tool for evaluating the effectiveness and efficiency of internal hospital operations than previously available.

The mean LOSs of the two data sets were compared to determine if there were any significant differences. Differences in the means could be due to differences in the medical care services provided. The reasons for these differences could be due to differences in the population served, differences in available services, or differences in the way in which the services are delivered. The answer to this becomes important prior to evaluating comparisons of medical services between groups.

The last research question was addressed because cost containment is as important to the military medical service as it is in the civilian sector. Since LOS has been shown to be correlated to the cost of services rendered, identifying independent variables which impact significantly on LOS can help management in determining how much, if at all, they can control the effect of these variables (i.e.

some characteristics may be uncontrollable such as mission statements and standard military operating procedures).

The primary research question was evaluated through a review of the literature concerning DRGs (Part 1), a review of the Air Force Medical Service, and the analysis of the secondary questions. The secondary question concerning the mean lengths of stay was evaluated using the following formula (chosen due to the continuous nature of the dependent variable, LOS and the type of data base evaluated):

$$Z = \frac{\bar{X}_M - \bar{X}_N}{\sqrt{\sigma_M^2/n_M + \sigma_N^2/n_N}}$$

There were two analytical tools used to evaluate the secondary question of variables within the military data base that had a significant impact on the dependent variable, LOS. These tools were AUTOGRP and an Analysis of Variance (ANOVA). AUTOGRP was chosen because of its ability to group a data base by given variables and to give specific details on the results of the procedures performed and the interactive capability of this software program which allows the researcher to make decisions based on results of previous procedures. The ANOVA analysis is a more traditional method of statistical analysis and was chosen based on the categorical nature of the variables being examined. The independent variables (Table 2.1) evaluated were:

(1) Demographics: age, race, sex, marital status.

(2) Military Characteristics: Beneficiary status (Active Duty, Retired, Dependents of Active Duty, Dependents of Retired, etc.), military rank, length of military service.

(3) Medical Care Characteristics: Provider (physician), Admission type (direct, transfer, other), Operative Procedures.

The independent variables were specifically chosen by the researcher for several reasons. Age was selected because a large portion of beneficiaries receiving care within the military medical system are Active Duty members and their dependents who are relatively young. While the DRGs are corrected for age, this researcher was interested in any additional impact of more finite age splits on the dependent variable, LOS. Marital status was selected because of the large number of new enlisted trainees at the host base. It was the intent of this study to determine if unmarried personnel are kept longer than those individuals who are married (and thus have the potential for support of home care). Sex and race were selected because they are demographics of the population not included in the DRG splitting exercise.

Beneficiary status was chosen to examine which groups had longer (or shorter) lengths of stay because this information is important in evaluating the needs of the population served, the quality of care rendered, and projecting changes in services required in the future. Rank and length of service were selected to evaluate if certain groups within these variables had different LOSs within the military group.

The medical care characteristics were chosen to determine if certain characteristics of the care process corresponded to differences within the military group.

These groups of variables, therefore, cover characteristics of the population in general, characteristics specific to the military environment, and characteristics of the care process. Any characteristics within these groupings could cause a change in the dependent variable and it is important to know the impact of these variables prior to attempting comparisons within the military system or between the military and civilian systems.

AUTOGRP was utilized to explore the data base and identify important variables. The first step involved looking at the data base as a whole. The "classify" command was invoked using various independent variables and the results were then examined. The second step involved forming individual groups for each of the ten most commonly occurring DRGs in the military data base. In addition, a subgroup was formed for each of the above ten groups comprised of active military duty members only. The "classify" command was invoked using various independent variables and the results were then examined for those active duty groups. AUTOGRP was also used to extract the descriptive statistics for this study.

An Analysis of Variance (ANOVA) was developed and performed on each of the ten most common DRG groups. A log

transformation of the dependent variable, LOS was accomplished as it more accurately described the LOS distribution. The independent variables for each of the ANOVAs was beneficiary status, sex, marital status, and admission types (Table 2.1).

TABLE 2.1

INDEPENDENT VARIABLES FOR AUTOGRP & ANOVA

VARIABLE	VALUE
Beneficiary Status	Active Duty (AD)
	RETIRED
	Length of Service (RET/LOS)
	Permanent Disability Retirement List (RET/PDRL)
	Temporary Disability Retirement List (RET/TDRL)
	DEPENDENT
	Active Duty (DEP/AD)
	Retired (DEP/RET)
	Deceased Retired (DEP/DEC RET)
	NATO
Sex	Male
	Female
Marital Status	Married
	Single
Admission Type	Direct
	Transfer
	Other

PART 3

ANALYSIS

DESCRIPTIVE STATISTICS

The study consisted of a review of 1323 records from 16 services (Exhibit 1) encompassing 254 DRGs (Exhibit 2). Descriptive statistics for this study are shown in Table 3.1.

COMPARISONS OF MEANS

The mean LOS for the military data set, the NHDS data set and the differences in mean LOS for the 10 most commonly occurring military DRGs are given in Table 3.2 (no outliers are removed). The mean LOS of these 10 DRGs in the military ranged from 2.11 days below to 16.66 days above the corresponding NHDS mean LOS. There were five of the ten DRGs where the differences in LOS were statistically significant at the p=.025 (two-tail) (actual difference in mean LOS between the two data sets are listed and the Standard Error (SE) of the military data set):

- DRG #56, Rhinoplasty, +2.46 days with SE = +.70;

- DRG #69 Otitis Media & URI Age 18-69 without Complications or Comorbidities, -1.93 days with S.E.= +.21;

- DRG #125, Circulatory Disorders except AMI, with Cardiac Catheterization without Complex Diagnoses, +5.64 days with S.E. = +2.14 (Mean LOS difference = +2.92 days, S.E.= +1.07 with outliers removed).

- DRG #421 Viral Illness, -2.11 days with S.E.=+.26;

- DRG #430 Psychoses, +16.66 days with S.E.= +5.68 (Mean LOS difference = +15.9 days; S.E.= +0.95 with outlier removed).

There were three of the 10 DRGs with operationally different LOS:

- #125, Circulatory Disorders as noted above;

- # 215, Back and Neck Procedures, +11.19 days with S.E.= +8.13 (Mean LOS difference = +2.43; S.E.= +2.8 with outlier removed)

- #430, Psychoses as noted above.

This brings out an important point in this study as in any other, which is that the researcher must judge the results in the light of the actual impact of changes in the dependent variable. In this case, where LOS is being investigated one might find a difference in mean LOS may be operationally different (e.g. is substantially different and impacts on the operational aspects of the institution) but not statistically different (i.e. DRG #215, +11.19 days) or vice versa (i.e. DRG #380, +1.1 days).

The range of the actual differences in means of all 254 DRGs in the study group was -20.9 to +35 days with two extreme outlier DRGs, #432 +61.6 days and #219, +156.6 days. Thirty-one percent (16% above and 15% below) of the DRGs mean LOS at the military MTF were statistically different from NHDS mean LOS. Table 3.3 shows the distribution of the means for the military data. As can be seen, 52% of the military DRG differences in mean LOS fall

within -3.0 and +3.0 days; 13.0% between +/- 3.01 and 5.0 days; 10.5% between +/- 5.01 and 7.0 days; 5.4% between +/- 7.01 and 10.0 days; 16.7% were +/- 10.01 or greater.

Assuming that one concurs that a difference of three or more days may be considered operationally (or substantially) different, then there are 22.6% of the study DRGs that have operationally and statistically different LOS. The question arises at this point, why are 22.6% of the study DRGs different? Why are 32 of the military DRGs statistically and operationally greater than the NHDS corresponding DRGs? Why are there 26 military DRGs that are lower LOS in than the NHDS data set? Is it due to population differences or to differences in the services provided? At this point there is no clear answer to these questions and it was not the intent of this study to go further into the comparison of the military data set to the NHDS data set than to determine if the means were equal.

AUTOGRP RESULTS

Results of analysis of the military data base by AUTOGRP are presented in Table 3.4. The initial analysis explored all DRGs in the military data as a single group. Provider (physician) grouping in all DRGs explained 21.8% of the unexplained variation in LOS in the entire military data base and DRGs explained 31.6% of the variation in the dependent variable for the entire study group. This means that DRGs are effective in explaining LOS and can be a useful management tool in evaluating LOS within an

institution.

Analysis of the ten most commonly occurring DRGs revealed some interesting results (Table 3.4). In nine of the ten DRGs the independent variable, provider (physician), could be grouped to explain a substantial amount of variance in mean LOS. Without more details on the providers (i.e. resident, board certified, number years of practice, etc.) it is impossible to evaluate the effectiveness of the grouping. It is very interesting to note, however, that the range of variance explained by provider is from 0 to 58% and that this variation occurs within a single institution under a common medical and management team. One would normally be inclined to expect variations between geographic areas or between institutions of different management teams but not within a single institution. These differences in LOS can be due to differences in provider practice patterns, differences in severity of cases treated by the provider (i.e. one provider admitting borderline patients that might have been treatable as an outpatient vs a provider who admits only those clearly requiring hospitalization), or management policies (i.e. admit ill, single, active duty members who live in barracks and must go out to dining halls for meals).

A cut-off of 10% explained variance by AUTOGRP was established as significant enough for discussion in this document. Age proved to group substantially in four DRGs: #125, Circulatory Disorders except AMI, with Cardiac Catheterization without Complex Diagnosis; #183,

Esophagitis, Gastroenteritis & Miscellaneous Digestive Disorders, Age 18-69 w/o CC; #355, Non-Radical Hysterectomy, Age < 70 w/o CC; and #430, Psychoses. (See Tables 3.4A, 3.4B, 3.4C, 3.4D in attachments). In DRGs 125 and 183 (Tables 3.4A and 3.4B) the grouping appears to be caused by five patients with unusually long mean LOS and DRG 355 (Table 3.4C) appears to be influenced by three patients with long mean LOS. A larger data set is needed to determine if these are outliers or if this distribution is consistent in a larger data base.

DRG 430 (Table 3.4D) shows a more definitive split in the grouping of age to explain mean LOS (17-22 year olds with a mean LOS of 53.6 days and 24-57 year olds with mean LOS 17.4 days with one outlier at 66 days). Obviously there is something occurring in the treatment of 17-22 year olds that makes them very different from the older group. It is at this point that management would need to explore the programs and care given to this group to determine if there is a satisfactory reason for this difference.

Operative procedures explained a substantial amount of variance in mean LOS (Table 3.4E) in only one DRG: #183, Esophagitis, Gastroenteritis & Miscellaneous Digestive Disorders, Age 18-69 w/o CC.. Cases which involved cardiac catheterization had a mean LOS of 4.0 days while all other operative procedures were grouped into a second group with a mean LOS of 17.36 days. If this finding were to reappear in a larger data set and the short length of stay is medically

appropriate for Cardiac Catheterizations and the longer LOS is appropriate for the other conditions listed, then consideration should be given to establishing an additional DRG to split this group for military use (assuming that resource consumption is different between these groups).

Marital status only grouped in one DRG, #183, Esophagitis, Gastroenteritis & Miscellaneous Digestive Disorders, Age 18-69 without Complications or Comorbidities (Table 3.4F). Patients who were single had a mean LOS of 3.08 days while married patients had a mean LOS of 8.44 days. This result poses an interesting question: Why is there a difference in LOS? Is it because one group is more sick and requires more care than the other? If this is so, why is one group sicker? Do single beneficiaries seek care sooner and therefore have a less severe case than marrieds? Are there social/environmental factors that cause this difference? These are questions to be explored in a subsequent study. To answer these questions, these new independent variables should be introduced in AUTOGRP after establishing the splits (groupings) created by provider grouping.

Beneficiary status grouped substantially in only one DRG, #183, Esophagitis, Gastroenteritis & Miscellaneous Digestive Disorders, Age 18-69 without Complications or Comorbidities (Table 3.4G). The first group was formed of active duty (AD) and retired on temporary disability retirement list (RET/TDRL) members with a mean LOS of 4.06 days. The second group included retired due to length of

service (RET/LOS) and dependents of retired personnel. In this case the grouping is probably related to the age factor since most AD and RET/TDRL would be younger than those patients in group two.

Other independent variables were evaluated but failed to group in such a way as to reduce the unexplained variance in LOS. These independent variables were race, sex, and admission type.

ANALYSIS OF VARIANCE (ANOVAs)

ANOVAs were executed using Statistical Analysis System (SAS) on the ten DRGs. A logarithmic transformation was performed on the dependent variable, LOS, as this more closely approximated the distribution. Although porviders appeared in AUTOGRP as the most significant variable, providers were not used in the ANOVA model due to the large number of physicians in the data set and the lack of knowledge as to whether the AUTOGRP splitting had functional significance (e.g. too many degrees of freedom would have been required if no grouping was attempted).

In DRG #56, Rhinoplasty, the model showed an R^2 of 0.719756 (p=0.0002). The independent variables that proved significant were beneficiary status (p=0.0563), marital status (p=0.0003), and admission type (p=0.0001). This indicates that this model explains 72% of the variance in the dependent variable, LOS (with a high degree of probability). Marital Status and Admission type are highly associated with the LOS and Beneficiary Status is also

significant but to a lesser degree. Marital Status and beneficiary status results indicate that there are population differences that cause variations within the military data set, while the admission type results indicate that there are possible differences in case mix that cause the variations in LOS.

DRG #69, Otitis Media & URI, Age 18-69 without Complications or Comorbities (w/o cc) had an R^2 of 0.180775 (p=0.2306). There were no variables with a significant impact on the dependent variable. This means that any differences in the dependent variable are due to factors not included in this model.

DRG #125, Circulatory Disorders except AMI, with Cardiac Catheterization, had an R^2 of 0.393116 (p=0.0910). The only significant variable in the model was admission type with a p value of 0.0068. This model explained 39% of the variation in LOS for this DRG and is somewhat significant. Admission type was highly associated with LOS. This would indicate that the LOS was influenced not by population characteristics but by the type of services needed.

DRG 162, Inguinal and Femoral Hernia Procedure, Age 18-69 w/o cc had an R^2 of 0.537132 (p=0.0078). Two variables showed significant effect on the model: beneficiary status (p=0.0127) and marital status (p=0.0008). This means that this model explains 53% of the variance in LOS and is a strong model. Marital status is highly associated with LOS while beneficiary status is associated to a lesser degree but still significantly. These variables indicate that

differences in the DRG within the WHMC data set may be due to population differences.

DRG #183, Esophagitis, Gastroenteritis & Miscellaneous Digestive Disorders, Age 18-69 w/o cc, had an R^2 of 0.349907 (p=0.1312). No variables were significant in this model. There is a good probability that the 35% explained variance is due to chance.

DRG 215, Back and Neck Procedures, had an R^2 of 0.524287 (p=0.0521). Sex (p=0.0105), beneficiary status (p=0.0313) and marital status (p=0.0261) were significant. This model explains 52% of the variance in LOS (although this result is not as strong as some of the other DRGs with a smaller p value). Again, sex, beneficiary status and marital status are variables that describe the population and therefore, evidence the possibility of differences in LOS being due more to these population differences than to the manner in which the care is provided.

DRG 243, Medical Back procedures, had an R^2 of 0.307798 (p=0.7065). Only marital status was significant at p=0.0359. This indicates that 30% of the variance is explained but there is high likelyhood that this is due to chance (p value is very high) and therefore that the model is not significant in this DRG.

DRG 355, Non-Radical Hysterectomy, Age < 70 w/o cc, had an R^2 of 0.735016 (p=0.0001). Only admission type (p=0.0001) was significant for DRG #355. This model explains 73% of the variance in LOS and is quite significant

at (p=0.0001). Since admission type is the significant variable, it is likely that the variation is due to differences in services provided and not population differences.

DRG #421, Viral Illness Age >=18, had an R^2 of 0.130810 with no significant variables in the model. This model was not significant in this DRG.

DRG #430, Psychoses, had an R^2 of 0.639448 (p=0.1441). Age (p=0.0295) was the only significant variable in this model. This model explains 64% of the variance in LOS but is only moderately significant. Age as a factor is associated with LOS and therefore indicates that differences are due to population differences.

SUMMARY REMARKS

Can DRGs be useful in the Air Force Medical Service? This study has shown that the use of DRGs allows one to compare characteristics of similar products (i.e. LOS). DRGs were developed to group diagnoses which retained medical integrity while reflecting comparable resource use. To determine if DRGs would be useful in financial comparisons between military and civilian medical treatment facilities, one would need to adjust the cost of military medical care for unique costs (i.e. maintaining and exercising Air Transportable Clinics and Hospitals, Air Staging Facilities (which care for patients moving through the aeromedical evacuation system), Wartime training exercises, etc.)

This study indicates that there is a difference in LOS in

some DRGs (either higher or lower) in the military versus the civilian system. Since the differences are not clustered together (i.e. all greater than or all less than the NHDS group), the differences are not due solely to the population, or the casemix/services provided but to a combination of these factors. The question now is what is there about the population, the patient mix or the manner in which the services are rendered which is causing this difference. How much of this difference is do to severity of illness differences of the cases in the two groups? In other words are the shorter military LOS due to the fact that military beneficiaries recover more quickly or are they less ill when admitted or are there policies within the military environment that cause patients to be discharged earlier? On the other hand, are longer military lengths of stay, due to these patients being more severely ill or healing more slowly, or the lack of adequate services for quick, accurate diagnosis, treatment and cure? These are questions that remain to be answered.

Are there factors within the military population or the military delivery of medical care that affects LOS? The results of AUTOGRP and ANOVA indicate that this is so. AUTOGRP (which gives the researcher more feedback of the independent variables impact on the dependent variable than ANOVA) indicates that population differences and casemix and/or services provided affect LOS in the military. Results of age, marital status, and sex in AUTOGRP and

marital status and sex in ANOVA indicates that there may be differences in the popluation which would explain variations of LOS within the military. Results of admission type, operative procedure and provider in AUTOGRP and admission type in ANOVA indicates that there may also be differences in the casemix or services provided that would explain the different LOSs within a military DRG category. The results of beneficary status in AUTOGRP and ANOVA indicates that there may be military characteristics that explain the differences in DRG LOSs within the military.

TABLE 3.1

DESCRIPTIVE STATISTICS

	Military Data	National Data
SAMPLE SIZE	1323	3854000
DRG CATEGORIES	254	468
MEAN AGE (YRS)	36.98	42.1
GENDER: MALE	59.4%	40.0%
FEMALE	40.6%	60.0%
MARITAL STATUS: MARRIED	61.0%	NA
OTHER	39.0%	NA
BENEFICIARY STATUS: ACTIVE DUTY	33.5%	NA
RETIRED	25.0%	NA
DEPENDENT	41.6%	NA

TABLE 3.2

DRGs WITH 20 OR MORE OBSERVATIONS

DRG	TITLE	MILITARY MEDICAL CENTER # OBSERVATIONS	MILITARY MEDICAL CENTER MEAN LENGTH OF STAY	MILITARY MEDICAL CENTER STANDARD ERROR	NATIONAL HOSPITAL DISCHARGE SURVEY, 1981 MEAN LENGTH OF STAY	NATIONAL HOSPITAL DISCHARGE SURVEY, 1981 STANDARD ERROR	ACTUAL DIFFERENCE IN MEAN LENGTH OF STAY (Mil-NHDS)
56	Rhinoplasty	28	4.96	0.70	2.5	0.3	2.46*
69	Otitis Media & URI Age 18-69 w/o cc	39	2.67	0.21	4.6	0.5	-1.93*
125	Circ Disorders exc AMI, w/ Card Cath w/o Complex Diagnosis	27	9.44	2.14	3.8	0.4	5.64*
162	Inguinal & Femoral Hernia Proc, Age 18-69 w/o cc	25	4.04	0.49	4.5	0.4	-0.46
183	Esophagitis, Gastroenteritis & Misc Digestive Disorders Age 18-69 w/o cc	28	6.14	1.42	4.4	0.4	1.74
215	Back & Neck Proc	22	22.59	8.13	11.4	0.9	11.19
243	Medical Back Prob	24	10.42	2.11	7.5	0.6	2.92
355	Non-Radical Hysterectomy Age < 70 w/o cc	25	7.96	0.84	7.3	0.6	0.66
421	Viral Illness Age > = 18	38	3.29	0.26	5.4	0.6	-2.11*
430	Psychoses	22	33.86	5.68	17.2	0.9	16.66*

*Note: Statistically Significant @ p=.025 (two-tailed)

TABLE 3.3

DISTRIBUTION OF DIFFERENCES
(MILITARY - NHDS)

OF DRG MEANS OF LENGTH OF STAY

RANGE	# OF DRGs	# OF DRGs SIGNIFICANT @ p=.025
> -20.0 DAYS	1	1
- 10.01 TO -20.0 DAYS	5	5
-7.01 TO -10.0 DAYS	3	3
-5.01 TO -7.0 DAYS	10	7
-3.01 TO -5.0 DAYS	13	10
-2.01 TO -3.0 DAYS	19	12
-1.01 TO 2.0 DAYS	9	2
0.00 TO -1.0 DAYS	30	0
0.01 TO 1.0 DAYS	29	0
1.01 TO 2.0 DAYS	26	1
2.01 TO 3.0 DAYS	21	8
3.01 TO 5.0 DAYS	21	8
5.01 TO 7.0 DAYS	17	6
7.01 TO 10.0 DAYS	11	4
10.01 TO 20.0 DAYS	28	9
> 20.0 DAYS	9	5

*NOTE: TWO-TAILED TEST

PART FOUR

LIMITATIONS

The major limitation of this project is the small size of the data base. Consequently, all results should be considered tentative due to the exploratory nature of the analysis of LOS and additional analysis on a large scale should be accomplished prior to any definitive conclusions about the data. The small data set meant that all DRGs were not represented and that there were relatively few DRGs with a large enough cell size to attempt analysis.

In addition, there was no detailed information on providers of care (only provider identification numbers were provided). As a result, the important implications of the providers grouping by AUTOGRP to explain the reasons for the variance in mean LOS is unknown.

Although no financial analysis was attempted here (original study looked at financial data), there are limiting factors in using DRGs for financial management in a military environment. Costs in military MTFs are aggregated at the service level and no lower. This means that patient specific costs can not be obtained under the current accounting system as no patient bill is generated. In addition, military facilities are "charged" or allocated expenses incurred by other base support organizations such as the fire department. The impact of these types of peculiarities in the cost accounting system makes it

virtually impossible to perform easy financial comparisons outside the Air Force system. Therefore, any finacnial application of DRG analysis would be severely limited.

The military environment poses another constraint in that there is a wartime mission which must be considered. Staff must be trained and medical skills maintained and facilities and equipment must be available at all times for potential combat casualties. A certain level of services, personnel and facilities must be available at all times for this contingency purpose. This requirement for readiness will constrain the amount of services, personnel and facilities that may be decreased (contrary to civilian counterparts) but need not constrain how effectively these resources can be used.

PART 5

CONCLUSION

IMPLICATIONS

Financial Analysis

As noted in the Limitations section, the potential for financial analysis using DRGs is limited in the military since costs are handled differently than in the civilian sector. However, if an acceptable weighting system could be developed for military use and adjustments made in the costing process, DRGs in conjunction with such weights would offer an objective method of resource allocation among MTFs.

If it were possible to track costs to the individual patient, it would be possible to identify which DRG categories required high resource use versus those with low resorce use. It would then be possible to evaluate the cost of care for specific DRGs and compare military costs to civilian costs within a region. The payoff of this type of comparison would be in identifying when it would be cost-effective to provide in-house care versus utilizing supplemental funds and civilian facilities for care. In addition, comparisons of costs between institutions and between military Major Commands could be effected.

Utilization Review

The information generated through analysis of medical care by DRG would allow management to identify the types of cases treated and the casemix within an institution. It

would be useful in identifying groups in the population that may require differing types or levels of care. This information could then be used in determining the scope of services, personnel assignments, and amount of operational and supplemental funding required at Medical Treatment Facilities (MTFs).

Productivity

As shown earlier, DRGs offer another tool to management to evaluate the effectiveness and efficiency of hospital operations. This tool offers management the ability to identify unusual elements (i.e. very high or very low LOS) in the care process. This is not to say that unusual elements are unacceptable, rather that these elements should be looked at in a closer way to determine the reasons for the deviation and whether these deviations are acceptable to management and the care process. In conjunction with a weighting system, management (this includes Chiefs of Services) can identify areas of light or heavy workload and redistribute this workload where possible within the institution.

Casemix and DRGs offers a method of evaluating the performance of individual providers and identifing potential problem areas (see next section on Quality Assurance). This information can be used to redistribute personnel, equipment and supplies within and between institutions. In addition, forecasting using information provided by DRGs will allow institutions to anticipate the changing needs of the population and the changing casemix in a timely manner.

By identifying ineffective use of medical resources, more services could be rendered to the benficiary population. This could result in a larger portion of the population having access to hospital care. This could reduce the overall costs of care (i.e. recovering CHAMPUS insurance patients from the civilian medical sector). More effective use of resources could also result in a savings by reducing the number of active duty patients sent to civilian institutions and paid for from supplemental funding.

Quality Assurance

Only physicians can evaluate the most significant finding in this study which was the grouping of physicians to explain a large amount of the variance in LOS.

As noted earlier, differences in physician practice patterns may be expected across geographic areas but not normally within a single institution. Some of this variation may be due to frequent transfers among institutions but since all Air Force facilities operate under standard procedures established by higher headquarters and practice under a single chief of service within an institution, one might expect a smaller impact of providers on LOS.

Data produced using DRGs will provide a Chief of Service with details of the practice of providers within the department (although this will be limited in the military due to lack of information on patient specific uses of services). With this information, providers carrying

unusually high or low work loads can be identified and evaluated to determine if management intervention is warranted (abnormally high workloads can indicate potential burn-out, inadequate time spent with patients, etc., while low workloads could be due to providers who are not as proficient as their colleagues, excessive amounts of additional duties or responsibilities such as numerous committee meetings or teaching responsibility, or management policies).

If the time ever comes that costs are identified at the patient level, more detailed provider care profiles can be developed and unusual use of ancillary services, or other management indicators identified and appropriate management action initiated (of course with the realization that there will always be some cases that fall outside the norm). This information will provide additional insight into the quality of care within an institution and would be an important addition of data for the Quality Assurance and Risk Management Committees.

RECOMMENDATIONS

Further research is necessary in the area of DRGs and military medicine. It is necessary to replicate this analysis with a much larger data set which includes all DRG categories and determine if the variables which were identified as being significant and insignificant in the analysis continue to remain so in a larger data set. Continued exploration to develop a more sensitive statistical model to explain LOS should also be untaken.

Since this project was strictly an exploratory study, the results are not to be taken as definitive. No policy changes should be effected nor should continued rsearch in other avenues of DRG investigation in the military environment be limited in any way based on these results. But one interesting finding should be explored in greater depth - the impact of the physician on LOS. Military physicians sould look closely at this finding and determine if it differs from the civilian environment. In addition, physicians should evaluate the reasons for these differences and how these causes impact on quality of care.

It is the belief of this researcher that the use of DRGs within the military is desirable and would be of benefit. To this end, several steps would need to be accomplished. Implementation of ICD-9CM for coding of medical records is essential (if this can be done through the diagnosis mapping computer tape being developed by the U.S. Army and personnel at Yale, then this would be a viable alternative to direct coding in ICD-9CM). Strong consideration should be given to the possibility of tracking costs to the patient in order to receive the full benefit of the financial analysis potential of DRGs.

Use of AUTOGRP for analysis of DRG information is also recommended. It is quick, easily learned and used and provides useful basic information that can guide future research.

Additional research should be done to determine why there

are differences in the mean LOS by DRG between the military and civilian sectors. The variables shown to be significant within the military data should be explored in greater depth to determine, if possible, the reason for their affect on LOS.

When DRGs are implemented within the military environment, they sould be fully integrated into Utilization Review, Quality Assurance and Risk Management, Financial Analysis and Performance (Productivity) Analysis in order to reap the greatest benefit.

Prior to implementing DRGs a complete educational program would need to be developed to inform all personnel of the purpose, use and value of DRGs to all groups in the health delivery field. Providers must be reassured that implementation of DRGs will assist in improving the care delivered to patients and will help to direct their efforts more effectively than in the past. Management must be reassured that the amount of useable data to be obtained will provide concrete information to assist in managing both daily operations and future planning for the facility.

In this day of high health care costs and public awareness, all measures that have a cost containment potential should be evaluated in the light of the benefit to the care process and society in general. It is more important each day to get the best value for each dollar invested in the health care industry whether that be within the military or the civilian sector.

FOOTNOTES

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EXHIBIT 1

LIST OF STUDY SERVICES

MILITARY DATA SET

****

Internal Medicine

Cardiology

Neurology

Oncology

General Surgery

Cardiothoracic Surgery

Neurosurgery

Ophthalmology

Otorhinolaryngology

Plastic Surgery

Urology

Gynecology

Pediatrics

Nursery

Orthopedics

Psychiatry

EXHIBIT 2

DRG	TITLE
1	Craniotomy age >18yr except trauma
4	Spinal procedures
5	Extracranial vascular proc
6	Carpal tunnel release
8	Peripheral & Cranial Nerve & other nerv sys proc age >70 WO CC
10	Nervous system neoplasms age >70 &/or cc
11	Nervous system neoplasms age < 70 wo cc
12	Degenerative nervous system disorders
13	Multiple sclerosis & cerebellar ataxia
14	Specific cerebrovascular disorders except TIA
15	Transient ischemic attacks
16	Nonspecific cerebrovascular disorders w cc
17	Nonspecific cerebrovascular disorders wo cc
19	Cranial & peripheral nerve & other nerv sys proc age < 70 wo cc
21	Viral meningitis
23	Nontraumatic stupor & coma
24	Seizure & headache age>=70 &/or cc
25	Seizure & headache age 18-69 wo cc
26	Seizure & headache age 0-17
32	Concussion age 18-69 wo cc
33	Concussion age 0-17
34	Other disorders of nervous system age >=70 &/or cc
35	Other disorders of nervous system age <70 wo cc
36	Retinal proc
37	Orbital proc
39	Lens proc
40	Extraocular procedures except orbit age >=18
41	Extraocular procedures except orbit age 0-17
42	Intraocular procedures except retina, iris & lens
47	Other disorders of the eye age >=18 wo cc
48	Other disorders of the eye age 0-17
50	Sialoadenectomy
52	Cleft lip and palate repair
53	Sinus & mastoid procedures age >=18
55	Misc ear, nose & throat O.R. proc
56	Rhinoplasty
58	T&A Proc exc Tonsillectomy &/or Adenoidectomy Age 0-17
59	Tonsillectomy &/or adenoidectomy age >=18
60	Tonsillectomy &/or adenoidectomy age 0-17
63	Other ear, nose & throat O.R. proc
64	Ear, nose & throat malignancy
65	Dysequilibrium
66	Epistaxis
68	Otitis Media & URI age >=70 & or cc
69	Otitis Media & URI age 18-69 wo cc
70	Otitis Media & URI age 0-17
72	Nasal trauma & deformity
73	Other ear, nose & throat Diagnoses age >=18
74	Other ear, nose & throat Diagnoses age 0-17
75	Major Chest Procedures
76	O.R. proc on resp syst except major chest w cc
77	O.R. proc on resp syst except major chest wo cc
82	Respiratory neoplasms
88	Chronic Obstructive Pulmonary Disease
89	Simple Pneumonia & pleurisy age >-70 &/or cc

90 Simple Pneumonia & pleurisy age 18-69 wo cc
91 Simple Pneumonia & pleurisy age 0-17
97 Bronchitis & asthma age 18-69 wo cc
98 Bronchitis & asthma age 0-17
99 Respiratory signs & symptoms age >=70 &/or cc
100 Respiratory signs & symptoms age <70 wo cc
101 Other resp diagnoses age >=70 &/or CC
102 Other resp diagnoses age <70
105 Cardiac Valve Procedure w pump & wo cardiac cath
106 Coronary Bypass w cardiac cath
107 Coronary Bypass wo cardiac cath
108 Cardiothor proc, except valve & coronary bypass w pump
109 Cardiothoracic proc wo pump
111 Major reconstructive vascular procedures age <70 wo cc
112 Vascular proc except major reconstr
115 Permanent cardiac pacemaker implant w AMI or CHF
116 Permanent cardiac pacemaker implant wo AMI or CHF
118 Cardiac Pacemeaker pulse Generator replacement only
120 Other O.R. proc on the circulatory system
122 Circulatory Disorders with AMI wo CV comp disch alive
123 Circulatory Disorders with AMI , expired
124 Circulatory Disorders exc AMI, w card cath & complex diag
125 Circulatory Disorders exc AMI, w card cath wo complex diag
129 Cardiac arrest
130 Peripheral vascular disorders age >=70 &/or cc
131 Peripheral vascular disorders age <70 wo cc
132 Atherosclerosis age >=70 &/or cc
133 Atherosclerosis age <70 wo cc
134 Hypertension
135 Cardiac congenital & valvular disorders age >=70 &/or cc
136 Cardiac congenital & valvular disorders age 18-69 wo cc
137 Cardiac congenital & valvular disorders age 0-17
138 Cardiac arrythmia & conduction disorders age >=70 &/or cc
139 Cardiac arrythmia & conduction disorders age <70 wo cc
140 Angina Pectoris
141 Syncope & collapse age >=70 &/or cc
142 Syncope & collapse age <70 wo cc
143 Chest pain
147 Rectal Resection age <70 wo cc
148 Major small & large Bowel proc age >=70 &/or cc
149 Major small & large bowel proc age <70 wo cc
154 Stomach, Esophageal & duodenal proc age >=70 &/or cc
156 Stomach, Esophageal & duodenal proc age 0-17
158 Anal proc age ,70 wo cc
159 Hernia proc except inguinal & femoral age >=70 and/or cc
160 Hernia proc except inguinal & femoral age 18-69 wo cc
161 Inguinal & femoral hernia proc age >=70 &/or cc
162 Inguinal & femoral hernia proc age 18-69 wo cc
163 Hernia proc age 0-17
165 Appendectomy w compl princ diag age <70 wo cc
167 Appendectomy wo compl princ diag age <70 wo cc
171 Other Digestive syst proc age <70 wo cc
172 Digestive malignancy age >=70 &/or cc
173 Digestive malignancy age <70 wo cc
174 G.I. Hemorrhage age >=70 &/or cc
175 G.I. Hemorrhage age <70 w/o cc

EXHIBIT 2

181 G.I. Obstruction age <70 w/o cc
182 Esophagitis, gastroenteritis & misc Digest dis age >=70 &/or cc
183 Esophagitis, gastroenteritis & misc Digest dis age 18-69 w/o cc
184 Esophagitis, gastroenteritis & misc Digest dis age 0-17
187 Dental Estraction & restorations
188 Other Digestive System Diagnosis age >=70 &/or CC
189 Other Digestive System Diagnosis age 18-69 w/o CC
191 Major Pancreas, Liver & Shunt Procedures
195 Total Cholecystectomey w/ CDE Age >=70 &/or CC
197 Total Cholecystectomey w/o CDE Age >=70 &/or CC
198 Total Cholecystectomey w/o CDE Age <70 w/o CC
200 Hepatobiliary Diagnostic Procedure for Non-malignancy
203 Malignancy of Hepatobiliary System or Pancreas
206 Disorders of Liver exc Malig, Cirr, Alc Hepa Age <70 w/o CC
208 Disorders of the Biliary Tract age <70 w/o CC
209 Major Joint Procedures
210 Hip & Femur Proc exc Major Joint Age >=70 &/or CC
212 Hip & Femur Proc exc Major Joint Age 0-17
214 Back & Neck Procedures age >=70 &/or CC
215 Back & Neck Procedures age <70 w/o CC
216 Biopsies of Musculoskeletal System & Connective Tissue
218 Lower Ext & Humer Proc exc Hip, Foot, Femur, age>=70 &/or CC
219 Lower Ext & Humer Proc exc Hip, Foot, Femur, age 18-69 w/o CC
221 Knee Procedures age >=70 &/or CC
222 Knee Procedures age <70 w/o CC
224 Upper Extremity Proc exc Humerus & Hand Age < 70 w/o CC
225 Foot Procedures
227 Soft Tissue Proc Age < 70 w/o CC
229 Hand Proc exc Ganglion
230 Local Excision & Removal of Int Fix Devices of Hip & Femur
231 Local Excision & Removal of Int Fix Devices exc Hip & Femur
232 Arthroscopy
234 Other Musculoskelet Sys & Conn Tiss O.R. Proc Age < 70 w/o CC
235 Fractures of Femur
239 Pathological Fractures & Musculoskeletal & Conn Tiss Malig
243 Medical Back Problems
245 Bone Diseases & Septic Arthropathy Age < 70 w/o CC
247 Signs & Symptoms pf Musculoskeletal System & Conn Tissue
248 Tendonitis, Myositis, & Bursitis
249 Aftercare, Musculoskeletal Sys & Conn Tissue
251 Fx, Sprns, Strns & disl of Forearm,Hand,Foot Age 18-69 w/o CC
252 Fx, Sprns, Strns & disl of Forearm,Hand,Foot Age 0-17
253 Fx, Sprns, Strns & disl of Uparm, Lowleg ex foot Age >=70 &/or CC
254 Fx, Sprns, Strns & disl of Uparm, Lowleg ex foot Age 18-69 w/o CC
255 Fx, Sprns, Strns & disl of Uparm, Lowleg ex foot Age 0-17
256 Other Diagnosis of Musculoskeletal Sys & Conn Tissue
257 Total Mastectomy for Malignancy Age >= 70 &/or CC
258 Total Mastectomy for Malignancy Age <70 w/o CC
261 Breast Biopsy Proc for Non-malig exc Biops & Loc Exc
262 Breast Biopsy & Local Excision for Non-malig
264 Skin Grafts for Skin Ulcer or Cellulitis Age <70 w/o CC
266 Skin Grafts except for Skin Ulcer or Cellulitis Age w/o CC
267 Perianal & Pilonidal Proc
268 Skin, Subcutaneous Tissue & Breast Plastic Proc
270 Other Skin, Subcut Tissue & Breast O.R. Proc Age <70 w/o CC
272 Major Skin Disorders Age >=70 &/or CC

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274 Malignant Breast Disorders Age >=70 &/or CC
275 Malignant Breast Disorders Age <70 w/o CC
276 Non-malignant Breast Disorders
277 Cellulitis Age >=70 &/or CC
278 Cellulitis Age 18-69 w/o CC
279 Cellulitis Age 0-17
285 Amputations for Endocrine, Nutritional & Metabolic Disorders
288 O.R. Proc for Obesity
294 Diabetes Age >=36
295 Diabetes Age 0-35
297 Nutritional & Misc Metabolic Disorders age 18-69 w/o CC
298 Nutritional & Misc Metabolic Disorders age 0-17
299 Inborn Errors of Metabolism
301 Endocrine Disorders Age <70 w/o CC
303 Kidney, Ureter, & Major Bladder Proc for Neoplasm
304 Kidney, Ureter, & Major Bladder Proc for Non-maliog Age >=70 &/or CC
305 Kidney, Ureter, & Major Bladder Proc for Non-maliog Age <70 w/o CC
306 Prostatectomy Age >=70 &/or CC
308 Minor Bladder Proc Age >=70 &/or CC
309 Minor Bladder Proc Age <70 w/o CC
310 Transurethral Proc Age >=70 &/or CC
311 Transurethral Proc Age <70 w/o CC
313 Urethral Proc Age 18-69 w/o CC
320 Kidney & Urinary Tract Infectins Age >=70 &/or CC
321 Kidney & Urinary Tract Infectins Age 18-69 w/o CC
322 Kidney & Urinary Tract Infectins Age 0-17
323 Urinary Stones Age >=70 &/or CC
326 Kidney & Urinary Tract Signs & Symptoms Age 18-69 w/o CC
331 Other Kidney & Urinary Tract Diagnosis Age >=70 &/or CC
332 Other Kidney & Urinary Tract Diagnosis Age 18-69 w/o CC
335 Major Male Pelvic Proc w/o CC
336 Transurethral Prostatectomy Age >=70 &/or CC
337 Transurethral Prostatectomy Age <70 w/o CC
338 Testes Proc, for Malig
339 Testes Proc, Non-Malig Age >=18
341 Penis Proc
342 Circumcision age >=18
347 Malignancy, Male Repro Sys Age < 70 w/o CC
348 Benign Prostatic Hypertrophy Age >=70 &/or CC
349 Benign Prostatic Hypertrophy Age <70 w/o CC
350 Inflammation of the Male Repro Sys
352 Other Male Repro Sys Diag
354 Non-radical Hysterectomy Age >=70 &/or CC
355 Non-radical Hysterectomy Age <70 w/o CC
356 Female Repro Sys Reconstructive Proc
357 Uterus & Adenexa Proc for Malig
358 Uterus & Adenexa Proc for Non-malig exc Tubal Interr
360 Vagina, Cervix & Vulva Proc
361 Laparoscopy & Endoscopy (Female) exc Tubal Interruption
362 Laparascopic Tubal Interr
364 D&C,Conization except malignancy
365 Other Female Repro Sys O.R. Proc
368 Infections, Female Repor Sys
369 Menstrual & Other Female Repor Sys Disorders
380 Abortion w/o D&C
381 Abortions w/ D&C

EXHIBIT 2

389 Full Term Neonate W/ Major Problems
392 Splenectomey Age >=18
397 Coagulation Disorders
399 Reticuloendothelial & Immunity Disorders Age <70 w/o CC
400 Lymphoma or Leukemia w/ Major O.R. Proc
401 Lymphoma or Leukemia w/ Minor O.R. Proc Age >=70 &/or CC
403 Lymphoma or Leukemia Age >=70 &/or CC
404 Lymphoma or Leukemia Age 18-69 w/o CC
405 Lymphoma or Leukemia Age 0-17
407 Myeloprolif Disord or Poorly Diff Neopl w/ Maj O.R. Proc w/o CC
413 Other Myeloprolif Disor or Poorly Diff Neopl DX Age >=70 &/or CC
414 Other Myeloprolif Disor or Poorly Diff Neopl DX Age <70 w/o CC
419 Fever of Unknown Origin Age >=70 &/or CC
420 Fever of Unknown Origin Age 18-69 w/o CC
421 Viral Illness Age >=18
422 Viral Illness & Fever of Unknown Origin Age 0-17
425 Acute Adjust React & Disturb of Psychosocial Dysfx
426 Depressive Neuroses
427 Neuroses except depressive
428 Disorders of Personality & Impuulse Control
430 Pyschoses
431 Childhood Mental Disorders
432 Other Dignoses of Mental Disorders
436 Alcohol Dependence
437 Alcohol Use Exc Dependence
438 Alcohol & Substance Induced Organic Menatal Syndrome
441 Hand Procedures for Injuries
443 Other O.R. Procedures for Injuries Age <70 w/o CC
453 Complications of Treatment Age <70 w/o CC
464 Signs & Symptoms w/o CC
468 Unrelated O.R. Proc

TABLE 3.4A

MEAN LENGTH OF STAY (MILITARY)
GROUPED BY AGE

DRG 125

CIRCULATORY DISORDERS EXCEPT AMI,
WITH CARDIAC CATHETERIZATION
WITHOUT COMPLEX DIAGNOSIS

GROUP 1: n=16 MEAN=6.31 SD=5.24

n	MEAN	AGE (INDEP VAR)
1	3.00	1
1	2.00	3
1	16.00	34
2	3.50	42
2	7.00	43
2	8.00	44
2	5.50	49
1	12.00	50
2	2.50	51
2	7.50	53

GROUP 2: n=11 MEAN=14.0 SD=15.54

n	MEAN	AGE (INDEP VAR)
2	16.00	54
1	35.00	57
1	10.00	59
1	51.00	60
1	7.00	62
1	4.00	63
2	4.00	64
1	4.00	65
1	3.00	67

TABLE 3.4B

MEAN LENGTH OF STAY (MILITARY)
GROUPED BY AGE

DRG 183

ESOPHAGITIS, GASTROENTERITIS,
& MISC DIGEST DISORDERS
AGE 18-69 WITHOUT CC

GROUP 1:	n=18	MEAN=3.0	SD=1.57
n	MEAN	AGE (INDEP VAR)	
3	2.67	18	
5	2.40	19	
1	2.00	20	
4	4.25	21	
1	4.00	22	
1	3.00	24	
1	4.00	29	
1	1.00	33	
1	3.00	35	
GROUP 2:	n=10	MEAN=11.8	SD=10.49
n	MEAN	AGE (INDEP VAR)	
1	1.00	36	
1	27.00	38	
1	31.00	41	
1	3.00	42	
1	6.00	52	
1	4.00	53	
1	4.00	56	
1	17.00	58	
2	12.50	59	

TABLE 3.4C

MEAN LENGTH OF STAY (MILITARY)
GROUPED BY AGE

DRG 355

NON-RADICAL HYSTERECTOMY
AGE <70
WITHOUT CC

GROUP 1:	n=14	MEAN=6.57	SD=1.09
n	MEAN	AGE (INDEP VAR)	
1	8.00	23	
1	6.00	26	
1	7.00	28	
1	5.00	30	
2	6.00	32	
1	6.00	33	
2	6.50	34	
3	7.33	39	
1	7.00	41	
1	6.00	42	
GROUP 2:	n=11	MEAN=9.73	SD=5.87
n	MEAN	AGE (INDEP VAR)	
2	9.00	43	
2	6.00	45	
1	6.00	46	
2	6.00	47	
1	7.00	49	
1	15.00	60	
1	11.00	62	
1	25.00	66	

TABLE 3.4D

MEAN LENGTH OF STAY (MILITARY)
GROUPED BY AGE

DRG 430

PSYCHOSES

GROUP 1: n=10 MEAN=53.6 SD=22.10	
n	MEAN AGE (INDEP VAR)
1	62.00 17
2	50.00 18
2	46.50 19
1	58.00 20
2	72.00 21
2	39.50 22
GROUP 2: n=12 MEAN=17.42 SD=17.54	
n	MEAN AGE (INDEP VAR)
2	18.00 24
1	66.00 25
1	9.00 26
1	18.00 29
1	6.00 37
1	17.00 41
1	2.00 42
1	19.00 45
1	11.00 48
1	8.00 52
1	17.00 57

TABLE 3.4E

MEAN LENGTH OF STAY (MILITARY)
GROUPED BY OPERATIVE PROCEDURE

DRG 125

CIRCULATORY DISORDERS EXCEPT AMI,
WITH CARDIAC CATHETERIZATION
WITHOUT COMPLEX DIAGNOSIS

GROUP 1:	n=16	MEAN=4.0	SD = 3.33
n	MEAN	OPERATIVE PROCEDURE (INDEP VAR)	
1	4	3723	RT/LT HEART CARD CATH
15	4	3721	RT HEART CARDIAC CATH
GROUP 2:	n=11	MEAN=17.36	SD=13.71
n	MEAN	OPERATIVE PROCEDURE (INDEP VAR)	
2	10	CARDIAC STRESS TEST NEC	
1	10	VENOUS CUTDOWN	
1	12	C-VASC SCAN/ISOTOP FUNCT	
2	12.5	TREADMILL STRESS TEST	
1	14	SCAN OF OTHER SITES	
1	14	PT EXERCISE NEC	
2	22.5	DX ULTRASOUND-HEART	
1	51	PULMON ART WEDGE MONITOR	

TABLE 3.4F

MEAN LENGTH OF STAY (MILITARY)
GROUPED BY MARITAL STATUS

DRG 183

ESOPHAGITIS, GASTROENTERITIS,
& MISC DIGEST DISORDERS
AGE 18-69 WITHOUT CC

GROUP 1: n=12 MEAN=3.08 SD=1.78		
n	MEAN	MARITAL STATUS (INDEP VAR)
12	3.08	SINGLE

GROUP 2: n=11 MEAN=8.44 SD=9.3		
n	MEAN	MARITAL STATUS (INDEP VAR)
16	8.44	MARRIED

TABLE 3.4G

MEAN LENGTH OF STAY (MILITARY)
GROUPED BY BENEFICIARY STATUS

DRG 183

ESOPHAGITIS, GASTROENTERITIS,
& MISC DIGEST DISORDERS
AGE 18-69 WITHOUT CC

GROUP 1:	n=18	MEAN=4.06	SD=5.87
n	MEAN	STATUS(INDEP VAR)	
1	3.00	33 RETIRED/TDRL	
17	4.12	11 ACTIVE DUTY	
GROUP 2:	n=10	MEAN=9.9	SD=8.97
n	MEAN	STATUS(INDEP VAR)	
1	6.00	31 RETIRED/LOS	
9	10.33	42 DEPENDENT/RET	

***** DRG = 56 ***** 1

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
STA	5	11 31 41 42 44
SEX	2	1 2
MAR	2	M S
ADM	2	1 2

NUMBER OF OBSERVATIONS IN DATA SET = 28

***** DRG = 56 ***** 2

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	7	5.02346586	0.71763798	7.34
ERROR	20	1.95593243	0.09779662	PR > F
CORRECTED TOTAL	27	6.97939830		0.0002

R-SQUARE	C.V.	ROOT MSE	LOS MEAN
0.719756	18.9636	0.31272451	1.64907452

SOURCE	DF	TYPE I SS	F VALUE	PR > F
STA	4	0.60664120	1.55	0.2230
SEX	1	0.01560371	0.16	0.6938

***** DRG = 56 ***** 3

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	TYPE I SS	F VALUE	PR > F
MAR	1	1.20129914	12.28	0.0022
ADM	1	3.19992181	32.72	0.0001

SOURCE	DF	TYPE III SS	F VALUE	PR > F
STA	4	1.07920631	2.76	0.0563
SEX	1	0.00032503	0.00	0.9546
MAR	1	1.90080918	19.44	0.0003
ADM	1	3.19992181	32.72	0.0001

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***** DRG = 69 *****

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
STA	3	11 42 53
SEX	2	1 2
MAR	2	M S
ADM	2	1 3

NUMBER OF OBSERVATIONS IN DATA SET = 39

***** DRG = 69 *****

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	5	0.82334179	0.16506836	1.46
ERROR	33	3.74024056	0.11334062	PR > F
CORRECTED TOTAL	38	4.56358235		0.2306

R-SQUARE	C.V.	ROOT MSE	LOS MEAN
0.180775	27.1363	0.33666099	1.24063010

SOURCE	DF	TYPE I SS	F VALUE	PR > F
STA	2	0.64572377	2.85	0.0722
SEX	1	0.04087316	0.36	0.5523

***** DRG = 69 *****

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	TYPE I SS	F VALUE	PR > F
MAR	1	0.10138622	0.90	0.3500
ADM	1	0.03683664	0.33	0.5724

SOURCE	DF	TYPE III SS	F VALUE	PR > F
STA	2	0.15332152	0.68	0.5104
SEX	1	0.08714978	0.77	0.3869
MAR	1	0.05866736	0.52	0.4769
ADM	1	0.03683664	0.33	0.5724

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***** DRG = 125 *****

1

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
STA	4	11 31 41 42
SEX	2	1 2
HAR	2	H S
ADM	2	1 2

NUMBER OF OBSERVATIONS IN DATA SET = 27

***** DRG = 125 *****

2

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	6	7.07872262	1.17982044	2.16
ERROR	20	10.92829426	0.54641471	PR > F
CORRECTED TOTAL	26	18.00721688		0.0910

R-SQUARE	C.V.	ROOT MSE	LOS MEAN
0.393116	37.4419	0.73919870	1.97425370

SOURCE	DF	TYPE I SS	F VALUE	PR > F
STA	3	0.53552338	0.34	0.7974
SEX	1	0.85896343	1.57	0.2244

***** DRG = 125 *****

3

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	TYPE I SS	F VALUE	PR > F
HAR	1	0.68686198	1.26	0.2755
ADM	1	4.97757383	9.11	0.0068

SOURCE	DF	TYPE III SS	F VALUE	PR > F
STA	3	1.09767524	0.67	0.5806
SEX	1	0.10186223	0.19	0.6705
HAR	1	0.20022549	0.37	0.5518
ADM	1	4.97757383	9.11	0.0068

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***** DRG = 162 ***** 1

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
STA	4	11 31 41 42
SEX	2	1 2
HAR	2	H S
ADH	1	1

NUMBER OF OBSERVATIONS IN DATA SET = 25

***** DRG = 162 ***** 2

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	5	1.79718120	0.35943624	4.41
ERROR	19	1.54839029	0.08149423	PR > F
CORRECTED TOTAL	24	3.34557149		0.0078

R-SQUARE	C.V.	ROOT MSE	LOS MEAN
0.537182	18.5298	0.28547194	1.54061189

SOURCE	DF	TYPE I SS	F VALUE	PR > F
STA	3	0.23609544	0.97	0.4273
SEX	1	0.26202776	3.22	0.0889

***** DRG = 162 ***** 3

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	TYPE I SS	F VALUE	PR > F
HAR	1	1.29905800	15.94	0.0008
ADH	0	0.00000000	.	.

SOURCE	DF	TYPE III SS	F VALUE	PR > F
STA	3	1.15304032	4.72	0.0127
SEX	1	0.06291746	0.77	0.3906
HAR	1	1.29905800	15.94	0.0008
ADH	0	0.00000000	.	.

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***** DRG = 103 *****

1

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
STA	4	11 31 33 42
SEX	2	1 2
HAR	2	N S
ADM	2	1 2

NUMBER OF OBSERVATIONS IN DATA SET = 28

***** DRG 103 *****

2

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	6	5.19146475	0.86524412	1.88
ERROR	21	9.64522642	0.45929650	PR > F
CORRECTED TOTAL	27	14.83669117		0.1312

R-SQUARE	C.V.	ROOT MSE	LOS MEAN
0.349907	41.3726	0.6777417	1.63807604

SOURCE	DF	TYPE I SS	F VALUE	PR > F
STA	3	3.73307196	2.71	0.0711
SEX	1	0.98107070	2.14	0.1587

***** DRG = 103 *****

3

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	TYPE I SS	F VALUE	PR > F
HAR	1	0.37343008	0.81	0.3774
ADM	1	0.10389201	0.23	0.6393

SOURCE	DF	TYPE III SS	F VALUE	PR > F
STA	3	2.65897699	1.93	0.1557
SEX	1	0.64872497	1.41	0.2479
HAR	1	0.25852748	0.56	0.4631
ADM	1	0.10389201	0.23	0.6393

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***** DRG = 215 *****

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
STA	4	11 31 41 42
SEX	2	1 2
HAR	2	N S
ADM	2	1 2

NUMBER OF OBSERVATIONS IN DATA SET = 22

***** DRG = 215 *****

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	6	7.66125439	1.27687573	2.76
ERROR	15	6.95145694	0.46343046	PR > F
CORRECTED TOTAL	21	14.61271133		0.0521

R-SQUARE	C.V.	ROOT MSE	LOS MEAN
0.524287	25.2534	0.68073727	2.69570028

SOURCE	DF	TYPE I SS	F VALUE	PR > F
STA	3	1.20343391	0.87	0.4804
SEX	1	3.40001480	7.34	0.0162

***** DRG = 215 *****

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	TYPE I SS	F VALUE	PR > F
HAR	1	2.99541042	6.46	0.0225
ADM	1	0.06239538	0.13	0.7189

SOURCE	DF	TYPE III SS	F VALUE	PR > F
STA	3	5.37325146	3.86	0.0313
SEX	1	3.95586713	8.54	0.0105
HAR	1	2.82485274	6.10	0.0261
ADM	1	0.06239538	0.13	0.7188

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***** DRG = 243 ***** 1

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
STA	6	11 12 31 32 41 42
SEX	2	1 2
MAR	2	M S
ADM	3	1 2 3

NUMBER OF OBSERVATIONS IN DATA SET = 24

***** DRG = 243 ***** 2

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	9	4.30131874	0.50014653	0.69
ERROR	14	10.12296248	0.72306875	PR > F
CORRECTED TOTAL	23	14.62428122		0.7065

R-SQUARE	C.V.	ROOT MSE	LOS MEAN
0.307798	40.1467	0.85033449	2.11806694

SOURCE	DF	TYPE I SS	F VALUE	PR > F
STA	5	0.37055810	0.10	0.9900
SEX	1	0.13681891	0.19	0.6702

***** DRG = 243 ***** 3

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	TYPE I SS	F VALUE	PR > F
MAR	1	3.89909133	5.39	0.0338
ADM	2	0.09485040	0.07	0.9368

SOURCE	DF	TYPE III SS	F VALUE	PR > F
STA	5	1.86064738	0.51	0.7610
SEX	1	0.09709811	0.14	0.7168
MAR	1	3.89315778	5.38	0.0359
ADM	2	0.09485040	0.07	0.9368

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***** DRG = 355 ***** 1

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
STA	4	11 41 42 44
SEX	1	2
MAR	2	M S
ADM	2	1 2

NUMBER OF OBSERVATIONS IN DATA SET = 25

***** DRG = 355 ***** 2

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	5	1.90010186	0.38002037	10.54
ERROR	19	0.68501520	0.03605343	PR > F
CORRECTED TOTAL	24	2.58511706		0.0001

R-SQUARE	C.V.	ROOT MSE	LOS MEAN
0.735016	8.9214	0.18987741	2.12834423

SOURCE	DF	TYPE I SS	F VALUE	PR > F
STA	3	0.72434610	6.70	0.0029
SEX	0	0.00000000	.	.

***** DRG = 355 ***** 3

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	TYPE I SS	F VALUE	PR > F
MAR	1	0.02999736	0.83	0.3731
ADM	1	1.14575840	31.78	0.0001

SOURCE	DF	TYPE III SS	F VALUE	PR > F
STA	3	0.21311650	1.99	0.1498
SEX	0	0.00000000	.	.
MAR	1	0.02999736	0.83	0.3731
ADM	1	1.14575840	31.78	0.0001

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***** DRG = 421 *****

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
STA	4	11 33 41 42
SEX	2	1 2
MAR	2	M S
ADM	2	1 3

NUMBER OF OBSERVATIONS IN DATA SET = 38

***** DRG = 421 *****

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	6	0.57493270	0.09582213	0.78
ERROR	31	3.82025654	0.12323408	PR > F
CORRECTED TOTAL	37	4.39518930		0.5937

R-SQUARE	C.V.	ROOT MSE	LOS MEAN
0.130810	25.1505	0.35104712	1.39578662

SOURCE	DF	TYPE I SS	F VALUE	PR > F
STA	3	0.18713309	0.51	0.6809
SEX	1	0.00223925	0.02	0.8936

***** DRG = 421 *****

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	TYPE I SS	F VALUE	PR > F
MAR	1	0.10046986	0.82	0.3735
ADM	1	0.28509056	2.31	0.1384

SOURCE	DF	TYPE III SS	F VALUE	PR > F
STA	3	0.04988728	0.13	0.9387
SEX	1	0.00353794	0.03	0.8664
MAR	1	0.08974879	0.73	0.4000
ADM	1	0.28509056	2.31	0.1384

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***** DRG = 430 *****

GENERAL LINEAR MODELS PROCEDURE

CLASS LEVEL INFORMATION

CLASS	LEVELS	VALUES
STA	6	11 31 32 41 42 44
SEX	2	1 2
MAR	2	M S
ADM	2	1 2

NUMBER OF OBSERVATIONS IN DATA SET = 22

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	7	10.66142636	1.52306091	2.33
ERROR	14	9.13858924	0.65275637	PR > F
CORRECTED TOTAL	21	19.80001560		0.0840

R-SQUARE	C.V.	ROOT MSE	LOS MEAN
0.538455	25.3429	0.80793340	3.18800963

SOURCE	DF	TYPE I SS	F VALUE	PR > F
STA	5	8.71483295	2.67	0.0625
SEX	1	1.27911557	1.96	0.1833

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: LOS

SOURCE	DF	TYPE I SS	F VALUE	PR > F
MAR	0	0.00000000	.	.
ADM	1	0.66747784	1.02	0.3291

SOURCE	DF	TYPE III SS	F VALUE	PR > F
STA	4	5.40775400	2.07	0.1491
SEX	1	1.93920582	2.97	0.1069
MAR	0	0.00000000	.	.
ADM	1	0.66747784	1.02	0.3291

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