Characteristics of High Staff Intensive Medicare Psychiatric Inpatients

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Previous analyses of the costs of Medicare psychiatric inpatients have been limited by the use of claims and provider cost reports that fail to quantify differences in patient characteristics and routine costs. This article uses new primary data from 66 psychiatric inpatient units in 40 facilities nationwide to measure the times staff spend in therapeutic and other activities caring for Medicare patients. Patient days are divided into two groups of very high and low staff intensity and patient characteristics compared in each group. Results identify key patient characteristics associated with high staffing days, including old age, dementia and cognitive impairment, severe psychiatric diagnosis, deficits in activities of daily living (ADLs), and assaultive or agitated behaviors. Policy implications and suggested enhancements are made with regard to the proposed CMS case-mix classification system based on claims data alone.

INTRODUCTION

Since 1982, psychiatric hospitals and distinct part units (DPUs) of acute general hospitals have been paid under the Tax Equity and Fiscal Responsibility Act (TEFRA) cost-based system. Patients treated in these facilities were exempted from per case general hospital prospective payment system (PPS) because of concerns that (1) the relevant diagnosis-related groups (DRGs) were too aggregated to isolate high-cost subgroups, and (2) many patients had significant numbers of uncovered days due to program benefit restrictions, thereby rendering a per stay basis of payment inefficient and inequitable. Provider payments under TEFRA have been limited to a target amount per discharge that does not reflect any changes in case mix or market factors (Frank and Lave, 1986; Schumacher et al., 1986; Horgan and Jencks, 1987; Langenbrunner et al., 1989; Cromwell, Harrow, and McGuire, 1991; Lave, 2003). Following the Balanced Budget Act of 1997 (BBA) that further restricted payments under TEFRA (Liu and Cromwell, 1998; Menke et al., 1998), Congress mandated CMS in the 1999 Balanced Budget Refinement Act (BBRA) to pursue the feasibility of a per diem prospective payment methodology for all psychiatric inpatients covered by Medicare.[1] Paying a fixed rate per day, in particular, must address high-cost outliers; namely, those patients (or patient days) with extraordinary staffing and other costs that could be systematically underpaid (Essock-Vitale, 1987; DesHarnais and Schumacher, 1991; Davis et al., 1995).

CMS recently published a proposed payment system for PPS-exempt psychiatric facilities based on internal research (*Federal Register*, 2003). The case-mix system was anchored by psychiatric and

[1] For alternative approaches to classifying psychiatric inpatients, refer to English et al., 1986; Ashcraft et al.,1989; Mitchell et al.,1987; Freiman, Mitchell, and Rosenbach, 1988; and Fries et al.,1990.

substance abuse DRGs with comorbid medical, psychiatric, and age adjustors (American Psychiatric Association, 2001a). Medicare claims, combined with hospital cost reports, were used to calibrate case-mix relative weights. Unfortunately, the usual cost-finding methods for identifying such patients are inaccurate. Although ancillary services could be costed with considerable accuracy because charges were unique to each patient, routine costs in the nursing units are based on a global average daily cost across all patients in a facility. Therefore, within a hospital, daily routine costs analyzed by CMS do not vary at all, thereby understating, or compressing, patient-specific cost differences. This limitation is notable in that approximately 85 percent of psychiatric inpatient costs are incurred on routine units involving staff assessment, counseling, drug management, nursing care, and behavioral monitoring rather than surgical and ancillary procedures off-unit (Cromwell et al., 2003). Moreover, claims-based costing is limited in meeting the congressional mandate that any new PPS be based on patient characteristics, many of which are not reported on claims. Unless the routine costs associated with individual psychiatric patients are quantified, the final case-mix cost weights are driven, in large part, by differences only in minor ancillary usage and facility-level characteristics.

Recognizing the limitations of claims, a broad national survey of psychiatric providers was conducted to collect primary data on the times staff spend with patients on routine units. After reviewing our data collection strategy and methods for constructing routine costs and ways to characterize patients, we present key findings showing how skewed are the differences in daily routine costs. Then, concentrating on the most versus least staff intensive inpatient days, we compare patients in terms of daily activities (e.g., group therapy), psychiatric and medical diagnoses, admission status, behavioral characteristics, and finally, medical treatments. We conclude by presenting a taxonomy of staff-intensive patient types and draw policy implications for a psychiatric inpatient classification system.

DATA COLLECTION

Sampling Strategy

An overlapping, four-stage hierarchical sampling design was employed: Census division, facility, psychiatric unit, and patient. The sampling frame for selecting facilities consisted of 1,846 inpatient psychiatric facilities with units exempt from the Medicare inpatient PPS. The sampling frame, first, was stratified by the nine Federal Census divisions to ensure that the results would be nationally representative. Probability proportional-to-size sampling (i.e., each facility's share of Medicare-covered psychiatric days) was conducted to select a final sample of facilities. Facilities with less than 10 beds were excluded from the sample for cost reasons to assure a minimum number of Medicare observations in each site. Using the regional random sample, facilities were contacted, and 40 agreed to participate on a first-to-agree basis constrained by regional sample quotas. The 40 sites comprised 2.2 percent of the national facility count and 4.5 percent of all Medicare-covered days. Strong industry support resulted in few invited hospitals opting out of the study. A total of 27 facilities were acute hospitals operating DPUs, 10 were private psychiatric hospitals, and 3 were public (i.e., county, State) psychiatric hospitals. Among the 1,846 Medicare providers, nationally, the participation rate by facility type is highest for the private psychiatric hospitals (3.6 percent)

and lowest for the public DPUs (1.3 percent). Of the sample of 40 facilities, 28 are non-teaching (1.8 percent) and 12 are teaching facilities (4.4 percent). Three were in rural localities (1.3 percent).

Although DPUs could be ascertained in CMS' provider database, no national listing of particular units by type (e.g., general, geriatric) is available to form a more refined sample frame. For hospitals that agreed to participate, their number and type of units were determined through telephone calls and one to three units were selected in each site to produce a representative mix of units. Units where Medicare patients are not treated were excluded (e.g., child and adolescent units) as were units dedicated to detox and processing admissions. A total of 66 units within facilities were sampled, comprising 62 percent of all units in the 40 participating facilities. Of these 66 units, 38 are general adult, 16 are geriatric, 4 are medical-psychiatric, 1 is forensic, and 7 are specialty units (e.g., substance abuse, developmentally disabled, psychiatric trauma). Because there were very few med-psych units in the sampled sites, yet all are expected to treat the most complex, costly patients, all self-designated med-psych units were included. Most (41) of the sampled units are located in acute general hospitals. The remaining 25 units are split between private psychiatric hospitals (19 units) and public psychiatric hospitals (6 units, including 1 forensic unit).

Once units were chosen, all patients (Medicare and non-Medicare) in a study unit during the 7-day data collection period were included in the sample. The number of days of data per patient varied from 1 to 7 days depending on whether a patient was admitted or discharged during the study period. The 7-consecutive day period was a pragmatic compromise that balanced our research need to capture staffing intensity on all weekday and weekend shifts with the extensive reporting burden on staff. All patients on a unit had to be included during a shift to accurately allocate time to Medicare patients. This precluded the use of a smaller Medicare cohort over a longer time period. Data collection was spread over 18 months and reflected staffing patterns in all four seasons of the year. Although staffing intensity may have been atypical in some units during the study, we expect any biases to average out over 40 facilities and 66 study units.

Sampling weights equal to the reciprocal of the probability of selection were developed to account for differing sampling proportions (Kish, 1965). Different sampling weights are used in the analysis depending on the unit of analysis, e.g., facility, unit, patient day.

Primary Data

Two-person study teams visited all sites prior to data collection. Interviews with hospital and unit managers were conducted on the first of the 2-day site visits to discuss market niche, staffing, case mix, and unit terminology. Direct observation by the study team was infeasible because of patient confidentiality concerns and disruptions in the process of care. Instead, the study team trained all routine unit staff on day, evening, and night nursing shifts on how to complete the forms. A site coordinator, usually a nurse, was trained intensively during the site visit to provide future staff trainings, manage data collection, and ensure quality control and patient confidentiality during the study. A week of data collection commenced the day after the site visit.

Three forms captured routine staff and patient times-in-activities for both Medicare and non-Medicare patients on every study unit. Each form covered one 8-

hour shift (480 minutes) and was collected for 21 shifts. Site coordinators checked forms daily for completeness and accuracy with support available from a 24-hour study hotline. Predesignated activities (e.g., meals, medications, group therapy) were nearly identical on forms for comparability. Staff dedicated to the unit reported their group and milieu activities on the Staff Activity Form (SAF). Staff seeing patients off-unit (e.g., radiology, operating room) were excluded. Very time-intensive activities with individual patients, such as one-to-one assigned observation and admissions assessments, were recorded on the Staff Log (SLOG). Nurses and mental health specialists also completed a Patient Activity Form (PAF) that tracked patient times in each activity. Consultant and non-unit staff time with individual patients (e.g., medical physicians, crisis staff, and lab technicians) were recorded in a log at the nurses' station.

A fourth, Patient Characteristics Form (PCF) was collected for every Medicare-eligible patient. No PCFs were collected on non-Medicare patients due to confidentiality constraints, and they are excluded from the analyses stratifying by patient characteristics. The PCF included demographic data and questions regarding behavioral and other characteristics that clinical staff determined most likely to be associated with high resource intensity (e.g., suicidality, legal status). It also included the *Diagnostic and Statistical Manual of Mental Disorders* (fourth edition) (DSM-IV) multi-axial psychiatric assessment (American Psychiatric Association, 1994). This diagnostic assessment is composed of the following five axes: Axis I—clinical disorders, other conditions that may be a focus of clinical attention; Axis II—personality disorders and mental retardation; Axis III— general medical conditions; Axis IV—psychosocial and environmental problems;

Axis V—Global Assessment of Functioning (GAF). The GAF is a 0-100 scale of mental functioning with lower scores indicating poorer functioning. The PCF was expanded after phase I of the study (a feasibility phase including the first 12 sites) to include more treatments (e.g., wound care, [intravenous] IV) and behavioral characteristics such as suicidality. The unit psychiatrist completed these forms with assistance from the treatment team at the end of the study or at time of discharge, whichever came first.

Extensive cleaning and editing of the data were conducted to address problems of wrong dates, inconsistent occupation definitions, and the like. Imputations were also carried out for missing patient data on a shift in order to avoid losing an entire day's worth of information. Imputations were either patient-specific, using shift times from a prior day or average night or weekend times where appropriate. Slightly more than 6 percent of patient days involved imputing one shift's worth of information—mostly on night shifts. Imputed total staffing minutes per patient day were only 1.8 percent higher than for non-imputed days, thereby justifying the use of all non-imputed and imputed Medicare patient days (4,149 days).

METHODS

Identifying High-Cost Patients

Primary time-in-activity data were in the form of patient, staff, and consultant logs at the shift level. Staff logs recorded staff time specific to individual patients for major activities (e.g., admission). More general staff time (e.g., time monitoring meals, group therapy, milieu management) was allocated to individual patients based on the percent of patient time spent in an activity. For example, group therapy was

allocated depending on each patient's percent of all patient group therapy time during the shift. Staff milieu management and non-patient activity times were allocated equally across all patients on the shift. Staff reported these two as residual activities after allocating their times to direct patient services. All consultant time was reported patient specific and did not need to be prorated.

Once staff times were assigned to individual patients on a shift, a weighted sum of times by nine staff positions was constructed for each patient. A common set of relative registered nurse (RN) hourly wages from sampled facilities were used as weights. For example, a patient might have had 200 minutes of RN time, 60 minutes of therapist, and 120 minutes of mental health specialist time during a day shift. Weighted total staff time, or resource intensity (costliness), would be 304.4 RN-equivalent minutes = $(200 \times 1.0) + (60 \times 0.8) + (120 \times 0.47)$, where relative RN wage rates are 1.0, 0.8 and 0.47, respectively. Using a fixed set of weights for all patients controls for inter-area differences in labor costs and reflects the higher staff skill needs of severely ill patients. It also allows us to interpret staffing intensity as a more accurate measure of the routine cost of care independent of geographic location or facility type.

Using the simple metric of resource intensive minutes, daily totals were derived for each patient by summing across the three shifts. After determining threshold values associated with daily totals, two Medicare study groups were created based on the highest (top 10 percent) versus lowest (bottom 10 percent) of resource intensive days. Characteristics of patients experiencing these very high or low intensive days are then displayed according to several analytic domains. The frequency that a particular characteristic appears in each group is a (relative) risk indicator of very high (low) staffing intensity. Comparing characteristics of patients at the two extremes of daily staffing intensity highlights best their potential contribution to routine costs. If little or no difference in relative risk is observed, it is unlikely that a characteristic is a cost driver.

Analytic Domains

High and low intensive patients are first described in terms of average daily times that staff spend with these patients in 18 activities ranging from personal care (e.g., help with toileting and grooming) to escorts off unit and overall milieu management. This analysis highlights the kinds of services that explain very intensive, costly days on the unit. Characteristics of patients then are divided into several analytic domains designed to capture different service and staffing needs. The psychiatric diagnosis domain includes principal diagnosis and severity. Axis I principal diagnoses were subdivided into five categories: (1) schizophrenia and other psychotic disorders; (2) dementias and delirium; (3) mood disorders; (4) substance-related disorders; and (5) a residual group (including eating disorders, post-traumatic stress disorders, anxieties). Next, project clinicians developed a list of 26 severe psychiatric conditions likely to explain resource-intensive patients. These included all 5-digit DSM-IV codes with the qualifiers severe, profound, or pervasive. Additional codes were identified by ranking all potentially severe diagnoses by average daily routine intensity and deleting those with below-average intensity. Conditions considered resource intensive on a high intensity basis included intermittent explosive disorder, impulse control and eating disorders, and borderline personality. (A list of codes is available on request from the authors.) Dual diagnosis patients included patients

either with a principal psychiatric diagnosis complicated by a substance-abuse diagnosis or with a substance-related disorder and a complicating psychiatric diagnosis.

The medical domain was reflected analogous to the way complicating conditions are in the current hospital PPS (information available on request from authors). Clinical staff identified a list of conditions that are particularly nursing intensive (e.g., insulin-dependent diabetes, chronic renal failure, acquired immunodeficiency syndrome (AIDS), self-inflicted wounds). Two procedure codes were also used as indicators of medical severity: morphine pump and peripheral IV catheter.

The behavioral domain included measures of both psychiatric and medical functioning. Status indicators on admission included two demographic characteristics, age and sex, plus residence prior to admission (e.g., nursing home), first break (i.e., first psychiatric admission), commitment status (voluntary, involuntary), cognitive impairment, deficits in ADL counts, and any history of falls. Behaviors during the stay affecting staffing needs included four indicators of safety risk: suicidal, assaultive, elopement, or self-neglect behavior. It also included whether the patient required hourly attention beyond routine monitoring for most of the day during the study period and whether the patient actually had one-to-one staff observation during the day.

Besides patient health and behavioral characteristics, actual care and treatment regimens also affect staff intensity. Indicators included number of medications at time of discharge or end of study, detox or electroconvulsive therapy (ECT), short- and long-term IVs, glucose monitoring, wound care, STAT lab work, neuro checks, and apnea monitoring.
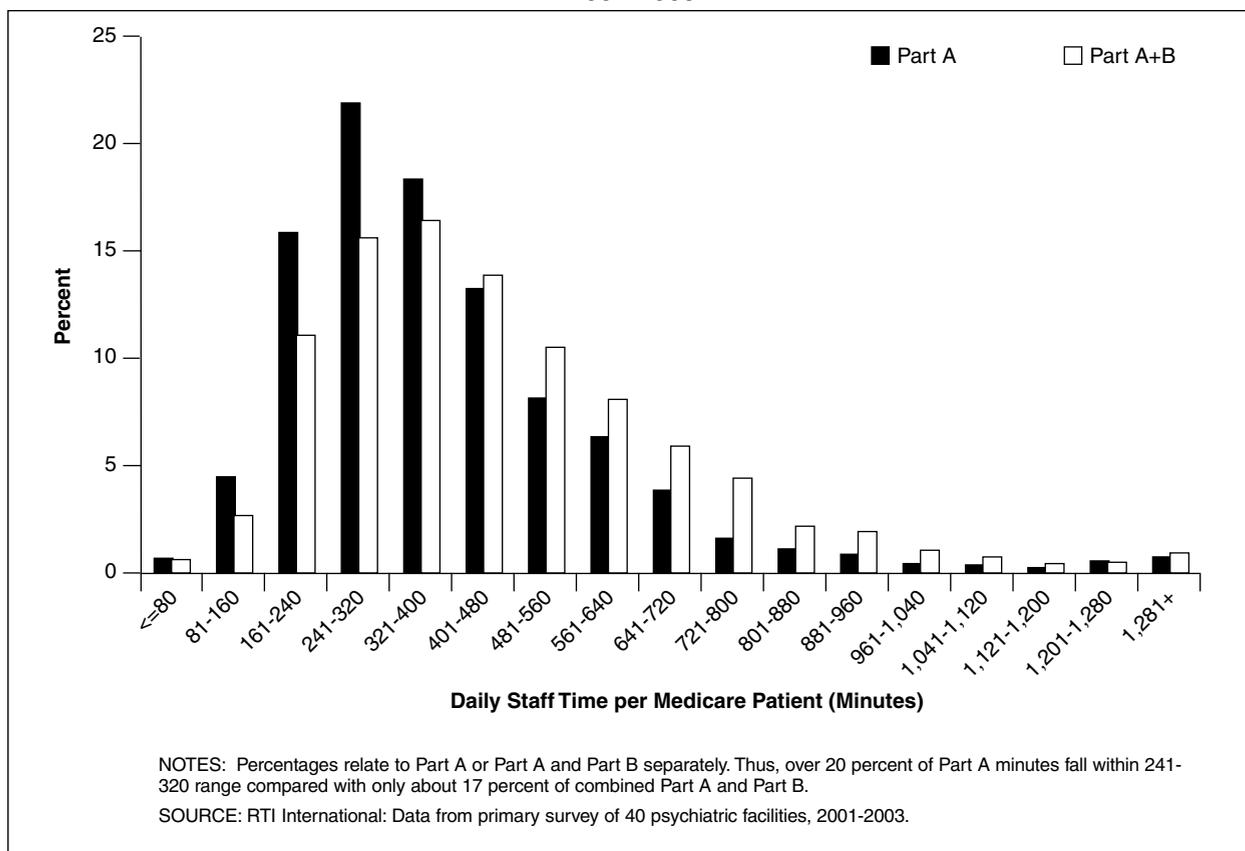
RESULTS

Skewness

Figure 1 and associated Table 1 demonstrate the skewness of routine resource intensity on a daily basis. The sample of 4,149 Medicare inpatient days show a mean of 463 RN-equivalent minutes per patient day across all Medicare Part A and Part B providers on the unit versus 392.4 minutes when limited to Part A staff alone. Daily Part A intensity ranged from 30 to 2,312 minutes, a 76-to-1 ratio. The top and bottom 10 percent thresholds imply that 20 percent of patient days differ by at least 7.5 hours of Part A RN-equivalent staff time ([642 − 187]/60). The interquartile range of 225 minutes implies that one-half of patient days differ by at least 3.74 RN-equivalent hours of staff time. At $25 per RN hour, not including ancillaries or overhead, the two ranges imply staffing cost differences of at least $188 and $94. The long right tail of the distribution, if it can be systematically related to patient characteristics, may result in a set of numerically small, but very costly patient groups.

Activities

The top 10 percent of Medicare inpatient days averaged 835.0 minutes of Part A-covered RN-equivalent staff time versus 150.1 minutes for the least intensive 10 percent of days, an absolute difference of 645 minutes, or 10.75 RN hours (Table 2). One-to-one staff observation time (including restraints/seclusion observation) accounts for 206.2 minutes, or 32 percent of the difference. Another 20 percent (133.6 minutes) is explained by assessment/treatment planning time. This includes treatment team meetings in which multiple staff

Figure 1

Frequency Distribution of Daily Staff Time per Medicare Patient: Part A and Total Part A Care: 2001-2003

NOTES: Percentages relate to Part A or Part A and Part B separately. Thus, over 20 percent of Part A minutes fall within 241-320 range compared with only about 17 percent of combined Part A and Part B.

SOURCE: RTI International: Data from primary survey of 40 psychiatric facilities, 2001-2003.

of all levels devote time to one patient that can result in greater intensity than one-to-one time. The third and fourth most important activities differentiating the two groups are unit based: milieu management/shift report and other (non-patient) staff activity. Together, these two activities explain more than 132 minutes, or 21 percent, of the difference between the high and low intensity days. Such differences are explained by systematic differences in overall staffing ratios and occupancy rates across facilities and psychiatric units. Nevertheless, nearly four-fifths of staff time between the two extreme intensive groups can be said to be devoted to individual patients during an inpatient day. Individual and group therapy staff time with patients, together, explain approximately 3.4 percent (21.8/645) of the aver-

age difference in intensity between the extreme intensity groups. This is equivalent to the average staff time patients receive in physical nursing care and only approximately one-half the time staff spends helping patients with their personal care. The minor role of group therapy activities may be attributable to their infrequent use on weekends. Also, when provided, staff group therapy time is spread across several patients at once unlike one-to-one personal and physical nursing care.

Table 2 includes patients who were admitted or discharged during the day. These truncated days lack three full shifts of care which explains some of the low intensity days. The difference in intake/discharge times alone explains little of the intensity differential (18.1 out of 645 minutes). Other results showed that patients

Table 1

Distributional Statistic for Medicare Daily Part A and Part B Resource Intensity[1] : 2001-2003

Statistic	Part A and Part B	Part A Providers Only
	Minutes	
Mean (4,149 Days)	463.0	392.4
Standard Deviation	246.6	214.0
Coefficient of Variation	53.3	54.5
Quintile Thresholds		
Maximum	2,379.2	2,312.6
Top 5 Percent	916.6	776.4
Top 10 Percent	758.4	641.8
Top 25 Percent	579.6	477.9
Median	410.2	345.3
Bottom 25 Percent	287.2	253.2
Bottom 10 Percent	210.1	187.1
Bottom 5 Percent	173.1	156.6
Minimum	29.7	29.7

[1] Resource intensity defined as the number of registered nurse wage equivalent staff minutes per patient day. Patient day figures weighted by sampling probabilities.

NOTES: Unweighted total days in parentheses next to mean. Figures include imputed data for 6.4 percent of days with at least one missing shift.

SOURCE: RTI International: Data from primary survey of 40 psychiatric facilities, 2001-2003.

on admission day (or night) were two to four times less likely to be involved in therapy, community meetings, structured activities, and physical nursing care.

Diagnoses

Table 3 presents demographic and diagnostic characteristics of patients associated with the top and bottom 10 percent of resource intensive days. In terms of principal diagnosis, very intensive patients are more likely (than the lowest 10 percent) to have dementia or a mood or residual "unclassified" disorder while schizophrenia patients are more likely to have low intensity days. DSM-IV taxonomy assigns affective psychotic disorders to the more intensive (and presumably costly) mood disorders instead of grouping them with lower cost schizophrenia in DRG 430. (Average daily intensity of mood disorders was 14 percent greater versus schizophrenia patients.) Patients with a substance-related principal diagnosis almost never experienced a high staff intensive day.

Consider, next, the severity of psychiatric illness. Over 57 percent of very intensive days involved patients with at least one severe complicating psychiatric disorder reported on either DSM-IV Axis I or II. When DRGs 429, organic disturbances, and 430, psychoses, are stratified by presence of a severe complicating psychiatric condition (not shown in table), patients with the complication are 23 percent more staff intensive, implying substantial within-DRG cost differences. Psychiatric severity and intensity of care is also borne out by GAF scores. Nearly two-thirds of very intensive days involved patients with GAF scores of 29 or less, implying poorer mental functioning. Conversely, only approximately one-third of very intensive patient days involved patients with GAF scores of 30 or above. Dual diagnosis does not seem to be associated with greater resource intensity. This is partially explained by the fact that 9 in 10 patients with a principal diagnosis of substance abuse were also dual diagnosis patients, and these patients tend to be the least staff intensive. Nevertheless, dual diagnosis patients with other than substance-abuse as a principal diagnosis were also found to be less intensive on average.

Table 2

Average Staff Intensity for Medicare Patients with Very High or Low Staff Intensive Days: 2001-2003

Resource Intensity[1]	Daily Staff Intensity			Absolute Difference
	Top 10%	Middle 80%	Bottom 10%	Top-Bottom 10% (Minimum)[2]
Total	929.3	432.7	191.2	738.0
Part A	835.0	361.6	150.1	644.9
Part B	124.3	86.0	44.8	79.5
		Part A Intensity Minutes		
Activity				
Personal Care	48.5	21.0	7.5	41.0
Meals	28.6	19.5	11.3	17.3
Medications	47.3	30.3	12.2	35.1
Intake/Discharge Planning	25.2	10.5	7.1	18.1
Assessment/Treatment Planning	145.4	53.9	11.8	133.6
Physical Nursing Care	25.2	8.8	2.4	22.8
Community Meeting	2.4	3.6	1.8	0.6
Individual Therapy	6.2	4.4	1.1	5.1
Group Therapy	20.8	11.5	4.1	16.7
Family Meetings	5.5	2.5	0.1	5.4
Structured Activity	9.0	12.1	7.9	1.1
Escort Off-Unit	3.4	2.3	0.8	2.6
Observation/Restraints	207.6	5.0	0.8	206.2
Checks	36.1	32.2	16.7	19.4
Milieu Management/Shift Report	118.0	66.8	33.7	84.3
Other Staff Activity	74.5	53.3	26.5	48.0
Legal/Court	3.0	2.3	0.5	2.5
Medical Record Charting	17.0	8.2	2.3	14.7

[1] Resource intensity defined as the number of registered nurse wage equivalent staff minutes per patient day.

[2] Top/bottom 10 percent defined as patient days in the higher/lowest 10 percent of Part A resource intensity. Means weighted by Medicare patient day sampling proportions. Activity mean values slightly different from overall Part A totals due to missing values.

NOTES: Includes patients who were admitted or discharged during the day. Observation includes restraints/seclusion observation. Medical records charting only for exceptional time (> 15 minutes) on certain patients (= zero for most patients with only routine charting).

SOURCE: RTI International: Data from primary survey of 40 psychiatric facilities, 2001-2003.

Table 3

Diagnostic Characteristics of Medicare Patients with Very High or Low Staff Intensive Days: 2001-2003

Characteristic	Part A Daily Staff Intensity		
	Bottom 10%	Middle 80%	Top 10%
Severe Psychiatric Diagnosis[1]	20.6	32.3	57.1
Global Assessment of Functioning Score			
< 29	38.2	49.8	65.7
30 +	61.8	50.2	34.3
Dual Diagnosis[2]	38.3	24.7	7.3
Any Medical Diagnosis	68.7	77.1	94.3
Severe Medical Diagnosis[3]	10.0	14.9	23.3
Major Diagnosis[4]			
Schizophrenia	51.9	46.5	34.0
Dementia	6.1	10.3	26.2
Mood Disorders	31.1	37.5	35.7
Residual Unclassified Disorder	1.1	2.2	3.8
Substance-Related	9.8	3.5	0.3

[1] Based on severe *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (DMS-IV) Axis I/II codes and other modifiers, supplemented by codes exhibiting high daily intensity.

[2] Includes patients with both a substance-related and psychiatric diagnosis.

[3] Based on DMS-IV Axis III medical codes selected by psychiatric and surgical nurses believed to be nursing intensive.

[4] Follows DMS-IV groupings.

NOTE: Percentages weighted by Medicare patient day sampling proportions.

SOURCE: RTI International: Data from primary survey of 40 psychiatric facilities, 2001-2003.

Table 4

Admission Status Characteristics of Medicare Patients with Very High or Low Staff Intensive Days: 2001-2003

Characteristic	Part A Daily Staff Intensity		
	Bottom 10%	Middle 80%	Top 10%
Sex			
Female	40.2	51.2	64.9
Male	59.8	48.8	35.1
Age Group			
Under 65 Years	82.7	61.1	34.2
65-74 Years	13.3	18.2	16.3
75 Years or Over	4.7	20.7	49.6
Prior Residence			
Nursing Home/Assisted Living Facility	10.5	15.4	46.5
Home, with Support	18.7	33.1	28.4
Correctional Facility	7.2	4.6	0.9
Psychiatric Facility	7.3	4.2	2.1
Group/Shelter/Halfway House	18.1	11.2	5.4
Homeless	9.7	5.9	0.4
Home, Alone	28.5	25.7	16.3
First Break[1]	10.9	9.5	20.9
Involuntary Commitment[2]	46.8	50.8	45.8
Cognitively Impaired[3]	38.2	49.5	70.8
ADL Deficits[4]			
0	63.3	53.7	24.6
1-2	15.0	18.1	9.9
3+	21.7	28.2	65.5
History of Falls[5]	15.8	24.2	54.8

[1] First known admission for mental problem.

[2] Commitment not converted to voluntary within 72 hours of admission.

[3] As reported by attending physician.

[4] Requiring assistance with walking, toileting, transferring, eating, bathing, and incontinence.

[5] History of accidental falls prior to admission.

NOTES: ADL is activity of daily living. Percentages weighted by Medicare patient day sampling proportions.

SOURCE: RTI International: Data from primary survey of 40 psychiatric facilities, 2001-2003.

Finally, the severity of a patient's medical condition also appears to be strongly related to staffing intensity. Almost 1 in 4 very intensive days involve patients with at least one severe medical condition compared with only 1 in 10 very low intensive days.

Admission Status

Table 4 describes several key characteristics of high and low intensive patients at time of admission. Patients experiencing very high resource intensity are more likely to be female and far more likely to be age 75 or over. This group, in fact, is nearly 10-times more likely to experience a very high versus very low staff intensive day. Female patients tend to be older. This explains the sex differential in large part.

Patients with very staff intensive days are far more likely to be admitted from a nursing home or assisted living facility or to have been living at home with support. By contrast, patients with low staff intensive days are far more likely to have been admitted from a correctional or psychiatric facility, from a group/shelter/halfway house, or to be homeless. Prior nursing home residence and severe medical diagnoses are consistent in their high resource needs on inpatient psychiatric units.

Table 5

Behavioral Characteristics of Medicare Patients with Very High or Low Staff Intensive Days: 2001-2003

Characteristic	Part A Daily Staff Intensity			Requiring One-to-One Observation[2]	
	Bottom 10%[1]	Middle 80%	Top 10%[1]	Yes	No
Safety Risk			Percent		
Assault	42.5	45.0	59.5	58	36
Elopement	17.4	15.9	22.9	19	12
Self-Neglect	38.7	31.0	46.5	54	32
Suicide	13.5	11.4	10.5	23	10
Requiring Hourly Attention					
Most Days[3]	24.0	23.8	49.3	46	14

[1] Bottom/top 10 percent staff intensity days based on number of registered nurse wage equivalent staff minutes per patient day and reflect percent of patient days on group with particular condition.

[2] Based on any one-to-one staff assigned observation during a given day.

[3] Based on at least 4 out of 7 study days.

NOTE: Patient days weighted by Medicare sampling proportions.

SOURCE: RTI International: Data from primary survey of 40 psychiatric facilities, 2001-2003.

Over 20 percent of very intensive patient days involved patients experiencing a first break compared with only 10.9 percent of low intensity days. Thus, first break patients are nearly twice as likely to experience a very high versus very low staff intensive inpatient day. Cognitively impaired patients and those with more ADL deficits or a history of falls are also much more likely to experience a very high than a very low intensive day on the psychiatric unit.

Behaviors

Very high intensive days are more likely to involve patients at risk of assaultive behavior, elopement, and/or self-neglect (Table 5). Suicidal patients do not appear to be prone to very intensive days. This may be due in part to facility characteristics. Suicidal patients were more commonly found in private psychiatric facilities that exhibit lower staffing per patient (Cromwell et al., 2003). The fact that patient days with one-to-one assigned observation were more than twice as likely to involve suicidal patients (23 versus 10 percent) suggests that these patients may be less intensive in other respects (e.g., personal or physical

care needs). The other three safety risk characteristics were also associated with a greater likelihood of one-to-one staff observation.

Patients requiring hourly attention are usually confused, needy, or in an agitated state. Staff reported that they spent inordinate amounts of time talking with and redirecting such patients. As expected, almost one-half of very intensive patient days involved such patients. It is notable, however, that nearly one-quarter of low intensity days also involved these patients. Less staff assessment or medical and personal care may account for these patients.

Treatments

Table 6 presents medical treatments of patients in the top and bottom 10 percent of resource intensive days on routine care units. Use of ECT, detox, and total number of medications was collected on the entire Medicare patient sample. Very staff intensive patients, excluding off-unit staff treatment time, were over three times (5.9/1.8 percent) more likely to have ECT, although this procedure was rarely used on any particular day. Very intensive patients were more than 1.3 times (92/65 percent) more

Table 6

Medical Treatment of Medicare Patients with Very High or Very Low Staff Intensive Days: 2001-2003

Treatment	Part A Daily Staff Intensity		
	Bottom 10%	Middle 80%	Top 10%
Electro-Convulsive Therapy	1.8	6.5	5.9
Number of Medications			
0-2	34.9	24.0	8.0
3+	65.1	76.0	92.0
Detox	10.8	6.6	2.5
Apnea Monitoring[1]	0.2	2.1	6.4
Short-Term Intravenous	1.1	4.0	10.5
Long-Term Intravenous	0.0	0.4	1.9
STAT Lab, X-Ray[2]	17.4	15.5	24.8
Neuro Checks[3]	39.1	18.1	20.8
Wound Care	23.1	12.6	17.9
Glucose Monitoring	35.5	25.4	28.2

[1] Monitoring a patient for sleep apnea.

[2] Procedures that must be done immediately.

[3] Monitoring neurological status.

NOTE: Percentages weighted by Medicare patient day sampling proportions.

SOURCE: RTI International: Data from primary survey of 40 psychiatric facilities, 2001-2003.

likely to have at least three medications. Detox patients were more than four times (10.8/2.5 percent) more likely to experience a very low versus very high intensive day. Although patients in detox require intense nursing monitoring and medications, this finding is consistent with the low intensities found for the substance-related principal diagnostic group.

More detailed questions regarding nursing and other services for medically intensive patients were included later in the study (approximately two-thirds of the total patient sample). The high intensity group was far more likely to involve patients on short-term IVs (10.5/1.1 percent) and apnea monitoring for sleep disorders (6.4/0.2 percent) and somewhat more likely to require immediate STAT X-rays or blood work (24.8/17.4 percent). The least intensive patients were approximately twice as likely to have neurological checks (39.1/20.8), which could be associated with detox monitoring. Contrary to expectation, wound care also was more likely in the low intensity group. Finally, according to site interviews, medical-psychiatric units reported use of ventilators, peripheral insertion of central catheter lines, and renal dialysis, all of which require intensive staff care, but their infrequent use was insufficient for comparison purposes.

DISCUSSION

Very staff intensive Medicare days can be linked in large part to individual patient characteristics and services provided, although a prominent role was found for general milieu staffing and management on smaller or underutilized units. Group therapy does not appear to differentiate low from high intensity patients. Rather, it is the patient needing substantial clinical assessment, treatment planning, and/or one-to-one monitoring that is very staffing intensive. Personal and physical nursing care, together, identify another intensive subgroup of patients. Some activities involving many hours of staff time such as legal/court visits are rarely observed for most patients, nor are they highly correlated with a particular

patient characteristic. Consequently, they play little role in explaining the most resource intensive patient days.

What patient characteristics account for these needs? In diagnostic terms, dementia patients, in general, and patients with a severe psychiatric illness or low GAF scores are much more likely to be staffing intensive. This corresponds with the need for greater assessment and treatment planning as well as one-to-one observation. Dementia and chronically depressed patients are also more likely to undergo ECT, which is very resource-intensive. In demographic terms, the very elderly, who are often admitted from nursing homes and are cognitively impaired with many ADL deficits and a history of falls, are staffing intensive. These patients require much more help with personal care and need substantial physical nursing care. Finally, assaultive and agitated patients in general can be very staff intensive in terms of assessment, one-to-one observation, and needing hourly staff attention.

The proposed Medicare inpatient prospective payment system uses 15 DRGs based on *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD9-CM) (Centers for Disease Control and Prevention, 2004) codes for mental disorders (DHHS/CMS, 2003). Approximately 75 percent of patients fall into just two DRGs: 429, organic disturbances; and 430, psychoses (unpublished statistics). The only other distinction made in psychiatric severity by CMS is two comorbid groups: eating/conduct and drug/alcohol-induced disorders. Our results suggest the alternative use of major DSM-IV diagnostic categories in lieu of the more aggregated DRGs. Of particular importance is dividing DRG 430, psychoses, into schizophrenia versus affective psychoses which DSM-IV categorizes as mood disorders. We also recommend expanding CMS' proposed diagnostic category of severe psychiatric illness that justifies enhanced payment.

The proposed payment system also enhances payment for patients age 65 or over and those with a severe medical condition. Our results strongly support both enhancements, although we would broaden the definition of a severe medical condition. However, an under/over age 65 indicator only partially reflects the very resource intensive needs of patients with many ADL deficits. CMS might consider enhancing payment for such patients. If it does, we found that only three deficits were key resource drivers: toileting, transferring, and bathing.

Unit staff we interviewed repeatedly emphasized the monitoring required for suicidal and assaultive patients who present a danger to self or others. Our results confirm the link between such behavior and time-consuming one-on-one staff observation—particularly for assaults. Because most inpatients must be an immediate danger to self or others to qualify for admission, CMS would need to develop indicators of very strong suicidal or assaultive tendencies. Study participants provided us with categories for both suicide and assaultive tendencies that they use to identify and validate very difficult behavioral patients (e.g., recent suicide attempts, lethal threats that would result in significant injury, hospitalization, or death).

ECT treatment tends to be isolated in the age 75 or over population who are cognitively impaired, seriously neglectful of self, and require fairly constant staff attention. When recommended, our clinical experts noted that an inpatient ECT protocol calls for 6-12 treatments over 2-3 weeks and is not available in many facilities. However, many patients with these characteristics do not undergo ECT during a stay. CMS might consider enhancing payment when patients

do undergo this very costly procedure in selected sites. The American Psychiatric Association (2001b) has published guidelines for ECT use, and patients would not appear to be at risk of unnecessary service use due to payment incentives.

Some of our recommended changes could be implemented easily at no extra burden on providers. DRGs could be replaced with more clinically meaningful DSM-IV diagnostic groups using ICD9-CM codes on claims. CMS' two psychiatric comorbid groups could be expanded using ICD9-CM codes as well. Major diagnostic group could be stratified by patient age to more accurately account for the age-diagnosis interactive effects on routine costliness. Going further, a modest set of behavioral indicators (e.g., ADL deficits, assaultiveness) would require a modest supplement to claims or other data collection instruments. Collecting these indicators from a sample of (or all) providers then correlating them with a facility-wide routine per diem, however, would only produce compressed, and likely inequitable, relative weights by payment group. Compression bias could be addressed, at least partially, if the Medicare cost report distinguished among the more staff intensive medical-psychiatric and geriatric units versus general routine units—analogous to the routine and intensive care unit distinctions for PPS costing of medical and surgical patients. Alternatively, CMS could use relative weights based on our case-mix groupings of 4,149 Medicare days (Cromwell et al., 2003) and adjust the national standardized amount as was done in developing the skilled nursing facility PPS.

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