Inpatient Transfer Episodes Among Aged Medicare Beneficiaries

William Buczko, Ph.D.

Examination of data derived from Medicare provider analysis and review (MEDPAR) discharge records for 152,337 transfer episodes of aged Medicare beneficiaries indicates that aged Medicare transfer patients have initial stays comparable to non-transfers in terms of length of stay, case-mix intensity, and total charges. During the final part of the transfer episode, however, transfers are clearly more intense cases than non-transfers. Patients treated for stroke or cardiovascular conditions are more likely to be transferred than other Medicare aged inpatients. The transfer episodes examined appear to reflect clinical considerations based primarily on patient need for specialized care.

INTRODUCTION

Transfers of Medicare beneficiaries from one hospital to another have received limited study. Although there have been studies of the cost implications of transfers for hospitals (Jencks and Bobula, 1988), little is known, at the patient level, about the types of medical conditions associated with transfers of aged Medicare beneficiaries either when first admitted or after transfer. This article examines discharge data for 152,337 hospitalized Medicare aged beneficiaries (65 years of age or over) who were transferred from one acute care facility to another during fiscal year (FY) 1987, to determine the conditions (diagnosis-related groups [DRGs]) most associated with transfers, the complexity of these conditions (DRG weight, incidences of surgery, number of payment outlier cases [under Medicare's prospective payment system (PPS)]) and differences in conditions, incidences of surgery and charges between initial and final stays in a transfer hospitalization episode and transfer stays and stays for all Medicare aged beneficiaries. The types of hospitals participating in transfers (e.g. teaching hospitals, disproportionate share hospitals [DSHs], rural referral centers [RRCs], and sole community hospitals [SCHs]) are examined.[1] The implications of the data presented for development of networks of inpatient facilities and for costs of care and reimbursement are also discussed.

TRANSFERS AND THE INPATIENT CARE NETWORK

The transfer of a patient from one hospital to another has historically occurred in instances where a patient requires treatment that is either unavailable at the hospital initially admitting the patient or could be performed more efficiently with

The author is with the Health Care Financing Administration (HCFA). The opinions expressed are those of the author and do not necessarily reflect HCFA's views or policy positions.

[1]DSHs are those hospitals that treat a high enough percentage of Medicaid and Medicare patients receiving supplemental security income payments to qualify for disproportionate share payments. RRCs are large rural hospitals with above average case-mix complexity who receive Medicare patients on referral. SCHs are primarily small rural hospitals that are the sole source of inpatient care in their area due to geographic isolation, weather and travel conditions, and absence of other competing hospitals.

better outcomes in another hospital. Often the required treatment is complex and technology-intensive, such as coronary bypass operations or organ transplants, and is in many instances referred to as "tertiary care." Sending admitted patients to hospitals specializing in tertiary care when such care is needed can be viewed as beneficial to quality of care and a justification for "regionalization" of such activity in hospitals specializing in tertiary care (Hughes, Hunt, and Luft, 1987; Maerki, Luft, and Hunt, 1986). Hospitals specializing in these types of complex modes of treatment are usually teaching hospitals.

Discharge-level research by the staff of the Prospective Payment Assessment Commission (ProPAC) found that the rate of transfers (transfers per 10,000 live discharges) had increased by about 25 percent from 1984 to 1988 and that the annual rate of increase in transfers was about 9 percent (Prospective Payment Assessment Commission, 1990a). Transfer rates declined with age and were substantially lower for beneficiaries 80 years of age or over than for beneficiaries under 80 years of age. This is expected because older beneficiaries are generally less likely to receive surgery or major operating room (OR) procedures because of their higher likelihood of comorbidities. However, many elderly Medicare beneficiaries live in rural areas, where patients needing major surgical procedures are often referred to urban hospitals or RRCs.

Sloan, Morrisey, and Valvona (1988), using Commission on Professional and Hospital Activities (CPHA) data containing discharges from a sample of 467 hospitals for 4 years (1980, 1983, 1984, and 1985), found an increase in transfer rates from 1983 to 1985, but found far less evidence of a trend toward increased transfer rates when data for 1980 were also considered, suggesting that the increase in transfers following PPS may be caused by other factors in addition to the beginning of PPS. Among Medicare patients, transferred cases were in no instance more than 3 percent of total Medicare discharges. Sloan et al. (1988) also found that most of the conditions representing a high volume of transfers involved some type of cardiovascular condition.

TRANSFER CASE COSTS AND PPS PAYMENT

Much of the initial research on cost implications of transfers occurred as part of research directed toward determining why teaching hospitals have higher costs than non-teaching hospitals, as Pettengill and Vertrees (1982), Cameron (1985), and Sloan, Feldman, and Steinwald (1983) suggested. As an extension of these studies, Welch (1987) found that as teaching involvement (residents per bed) increased, the percentage of transfers received increased and the percentage of transfers sent declined.

Research by Jencks and Bobula (1988) shows that, at the hospital level, transfers received increase with the ratio of residents to beds and that transfers received are more expensive than Medicare discharges where a transfer was not involved. Some of this reflects higher use of expensive care in intensive care units (ICUs) by transfers (Coulton et al., 1985; Munoz et al., 1988). Jencks and Bobula (1988) found that the percent of transfers received accounted for a small but significant increase in Medicare inpatient charges per case that was independent of case-mix (average DRG weight), resident-

to-bed ratio, hospital location, hospital size, and local prices. Additionally, using patient-level data for the 20 most frequently transferred DRGs, they found that, within DRGs, charges for cases received as transfers were higher than for non-transfers.

Under PPS, hospitals transferring patients to other inpatient facilities receive a per diem payment based on the average cost and length of stay for the DRG assigned to the initial stay. Hospitals receiving Medicare patients as transfers receive the full DRG payment for the final stay (the DRG assigned to the final stay need not be the same as the DRG assigned to the initial stay). Transfers may receive additional outlier adjustments to their DRG payment for days of care or costs exceeding the outlier thresholds established for the DRG assigned for the final stay. For initial stays, only cost outlier payments may be received.

As part of research evaluating the adequacy of payments for transfer cases under PPS, ProPAC (1990b) found that payments and costs for the initial stay of a Medicare transfer episode were approximately equal as an artifact of per diem payment under PPS for these stays. However, they found that costs were significantly higher than payments for the final stay in the transfer episode. This shortfall primarily reflects the high percentage of outliers among final stays and is influenced heavily by the ratio of payment to cost observed for non-transfer outliers.

ProPAC's research also found that teaching hospitals, DSHs, and hospitals in large urban areas had received a substantially higher net percentage of Medicare cases as transfers ([transfers received – transfers out]/ total discharges) than non-teaching, non-DSH, and rural hospitals (Prospective Payment Assessment Commission, 1990b). Hospitals with high percentages of net transfers received also had higher occupancy rates, higher case-mix indexes, longer lengths of stay, and higher percentages of surgical cases and outliers than other hospitals. Additionally, both PPS and total facility margins were higher for hospitals receiving high percentages of net transfers (Prospective Payment Assessment Commission, 1990b). Their data suggest that high net inflow of Medicare transfers does not detract from the profitability of either Medicare patients or total facility operations.

Since Medicare has shifted from cost-based to DRG-based payment under PPS, observers have been concerned that inpatients who appear likely to generate losses (relative to PPS reimbursement) will be transferred in order to cut losses. This practice is often called patient "dumping." Ellis and Ruhm (1988) developed a theoretical model of transfer behavior under a DRG system, suggesting that hospitals had incentives to transfer patients if underpayment was likely. However, their model did not consider outlier payments in their assessment of transfer gain or loss.

Newhouse (1989) examined the hypothesis that, under PPS, hospitals have the incentive to dump Medicare patients who appear likely at admission to generate revenue losses because they are assigned to an unprofitable DRG. However, he did not find evidence to indicate that the transfer of Medicare inpatients was more likely given his estimated profitability of the case or that transfers were used as a tool to dump unprofitable cases.

While the studies cited in the previous paragraphs indicate some of the impacts

of transfers on Medicare cost per case, rarely has the case composition of stays in a transfer episode been examined to determine the conditions associated with initial (sending) stays and final (receiving) stays. The data analyses will examine the DRGs most associated with transfers, the clinical characteristics of transfer cases, and variation in charges, both within a transfer episode and between transfer stays and stays for all Medicare aged beneficiaries. Characteristics of hospitals participating in transfers are also examined.

DATA

The data for transfer discharges are derived from a merged file of MEDPAR data for FY 1987 containing discharges for Medicare beneficiaries 65 years of age or over who were discharged from a short-stay hospital and admitted to a different hospital. This file links all discharges where a beneficiary is discharged from a hospital and readmitted to a different hospital on the same day.

Although transfer episodes with more than two hospital stays (i.e., the patient was transferred more than once) were included in this file, these episodes were excluded from the analysis to control for extraneous variation that these episodes may introduce. Because multiple stay episodes constitute less than 10 percent of total transfer episodes, this is a relatively small deletion of cases to insure comparability across discharges. Of the remaining 196,880 transfer episodes, those involving a PPS-exempt unit were also excluded from most of the analyses presented here, although some data including these transfers are presented. All remaining episodes in the merged file of discharges for the initial and final stay of transfer episode (send-receive file) represent those Medicare patients who were admitted to a short-stay inpatient facility paid under PPS, transferred to another PPS inpatient facility and released ($n = 152,337$).

This approach to defining transfers is used because previous studies of Medicare transfers found that the admission and discharge destination information in the MEDPAR file were often inconsistent (Jencks and Bobula, 1988; Freiman and Sederer, 1990). As a result, the same methodology for defining transfers is used in this article.

Data for all Medicare aged beneficiaries were obtained from the 20-percent MEDPAR file for FY 1987. In order to obtain data on hospital characteristics, the send-receive file was merged with the Medicare Provider Specific file. DRG weights for FY 1987 were also linked to these data.

CHARACTERISTICS OF THE TRANSFER EPISODE

The following paragraphs present descriptive data on the initial and final discharges in transfer episodes for aged Medicare beneficiaries. The data presented in Table 1 show that while initial stays of transfer episodes are slightly less severe and less costly than the average Medicare discharge, final stays in the transfer episode are far more severe and costly than both initial stays and the average Medicare stay. The average length of stay for initial stays in a transfer episode is 5.7 days. This is shorter than the average length of stay for all PPS discharges in 1987 (8.8 days). In contrast, the average length of stay for final stays is 11.8 days. Similarly, the average number of ICU days

Table 1

Comparison of Sending and Receiving Transfer Admissions and All Medicare Admissions, by Selected Characteristics

Selected Characteristics	Admissions		
	Sending	Receiving	All Medicare
Average Stay			
Total Days	5.7	11.8	8.8
Intensive Care Unit	1.1	2.1	0.7
Coronary Care Unit	0.7	1.2	0.4
Average Case DRG Weight	1.130	2.178	1.292
Outlier Cases		In Percent	
Total	1.6	9.2	3.9
Day	0.6	6.3	3.0
Cost	1.0	2.9	0.9
Average Outlier Days	0.2	1.0	0.5
Average Number of Diagnoses	3.7	4.0	3.8
Average Number of Procedures	0.9	2.1	1.2
Percent Surgeries	44.2	84.4	60.7
Average Charge		In Dollars	
Total	4,820	13,815	6,478
Ancillary	3,094	9,747	4,055
Intensive Care Unit	501	1,144	359
Coronary Care Unit	309	635	169
Operating Room	101	1,183	415

NOTE: DRG is diagnosis-related group.

SOURCE: Buczko, W., Health Care Financing Administration, 1993.

and coronary care unit (CCU) days are much higher in final stays of transfer episodes than in initial stays. However, the average ICU and CCU days for either part of the transfer episode are greater than average ICU and CCU use for all aged Medicare hospitalizations. Days of care for the whole transfer episode (initial plus final stays) are approximately double that of the average Medicare hospitalization for aged beneficiaries.

One indicator of the greater severity of final stays in a transfer episode is the substantial increase in the weight of the DRG assigned to final stays (1.130 for initial stay versus 2.178 for final stay). As will be shown later, this reflects the shifting of patients to more intense surgical DRGs after transfer. Also, the DRG weight for initial stays is slightly lower than the average for all aged Medicare hospitalizations. In contrast, the DRG weight for final stays is much higher than the average for all aged Medicare hospitalizations.

Similarly, although only 1.6 percent of all initial transfer stays qualified for Medicare outlier payments, 9.2 percent of final stays qualified for outlier payments. For all hospitalizations of aged Medicare beneficiaries, 3.9 percent of cases qualified for Medicare outlier payments. Most of the initial stay outliers qualified as cost outliers, as shown in Table 1.[2] Most of the final-stay outlier cases qualified as day outliers, as was evident for all aged Medicare hospitalizations. However, a greater percentage of final stay outliers qualified as cost outliers.

[2]Although a few initial stays exceeded the length-of-stay outlier threshold for their DRGs, PPS payment policy does not permit these cases to receive additional outlier payments.

The major reason for the observed differences between initial and final stays is the increase in number of procedures and incidence of surgery during the final stay. Surgery was performed in 44.2 percent of initial stays and 84.4 percent of final stays, compared with 60.7 percent for all aged Medicare hospitalizations. This difference is also reflected in the greater number of procedures in final stays of transfer episodes when compared with either initial stays or stays for all aged Medicare beneficiaries.

The increased incidence of surgery after transfer has a major effect on charges for transfer episodes. Charges are far greater in the final stay of the transfer episode. The average total charge for the initial stay in transfer episodes is $4,820, which is less than the average charge for all PPS discharges ($6,478) and reflects the shorter length of stay for initial stays. In contrast, the average charge for final stays is $13,815 and reflects the greater likelihood of major surgery for these stays. This is consistent with the research of Jencks and Bobula (1988), which found that charges for final stays of transfers were 1.375 times greater than charges for non-transfers. As observed for days of care, the sum of average charges for initial and final stays is greater than twice the average charge for all hospital stays for aged Medicare beneficiaries.

As Table 1 indicates, average ancillary charges, ICU charges, CCU charges, and OR charges are also substantially higher after transfer. As with ICU and CCU days, charges for both initial and final stays are significantly greater than the average for all Medicare hospitalizations. The most striking difference is the increase in OR charges after transfer, which suggests that the surgical procedures performed in the initial stay are of low complexity, especially because OR charges for initial stays are far less than average OR charges for all aged Medicare hospitalizations.

TRANSFER EPISODES BY DRG

Often, differences observed between initial and final stays reflect differences in DRG assignment during the transfer episode. Transfer episodes were usually initially admitted for non-surgical conditions. The most frequently occurring conditions in the initial stay were cardiovascular conditions (Major Diagnostic Category [MDC] 5, DRGs 103-145) accounting for 52 percent of all transfer episodes (Table 2). More than 97 percent of initial admissions in MDC 5 were for medical rather than surgical DRGs.

As shown in Table 2, the most frequently occurring condition in initial stays of transfer episodes is DRG 140 (Angina Pectoris), which accounted for 13.6 percent of initial stays. Other conditions accounting for significant shares of initial stays were DRG 122 (Circulatory Disorders w AMI w/o C.V. Comp Disch Alive), DRG 121 (Circulatory Disorders w AMI and C.V. Comp Disch Alive), DRG 127 (Heart Failure & Shock), DRG 14 (Specific Cerebrovascular Disorders except TIA), DRG 138 (Cardiac Arrythymia and Conduction Disorders w CC). This list of conditions suggests that transfer patients were initially admitted for routine conditions that usually require either only medical or minor surgical intervention.

In contrast to initial stays, final stays in a transfer episode are usually character-

Table 2

Most Frequent Diagnosis-Related Groups (DRGs) for Medicare Transfers: Initial Hospitalizations, 1987

DRG Code	Description	Transfer Cases	Percent of Transfers	Percent of Total Discharges
140	Angina Pectoris	20,793	13.6	3.8
122	Circulatory Disorders w AMI w/o C.V. Comp Disch Alive	14,252	9.4	1.3
121	Circulatory Disorders w AMI and C.V. Comp Disch Alive	11,139	7.3	1.4
127	Heart Failure and Shock	7,742	5.1	5.3
14	Specific Cerebrovascular Disorders except TIA	6,256	4.1	3.3
138	Cardiac Arrythymia and Conduction Disorders w CC	6,176	4.1	2.1
124	Circulatory Disorders except AMI, w Cardiac Cath and Complex Diagnosis	5,950	3.9	0.8
89	Simple Pneumonia/Pleurisy Age >17 w CC	3,302	2.2	3.4
174	G.I. Hemorrhage w CC	2,655	1.7	1.5
82	Respiratory Neoplasms	2,293	1.5	0.9
182	Esophagitis, G.I. and Misc. Digest Disorders Age >17 w CC	2,243	1.5	2.8
15	Transient Ischemic Attack And Precerebral Occlusions	2,193	1.4	1.6
130	Peripheral Vascular Disorders w CC	2,146	1.4	0.8
207	Disorders of the Biliary Tract w CC	2,088	1.4	0.4
125	Circulatory Disorders except AMI, w Cardiac Cath w/o Complex Diagnosis	2,042	1.3	1.1
236	Fractures of Hip and Pelvis	1,919	1.3	0.4
243	Medical Back Problems	1,690	1.1	1.4
316	Renal Failure	1,643	1.1	0.4
296	Nutritional and Misc Metabolic Disorders Age >17 w/o CC	1,563	1.0	2.2
10	Nervous System Neoplasms w CC	1,499	1.0	0.2

NOTES: Inpatient stays only. No excluded units. AMI is acute myocardial infarction. C.V. is cardiovascular. Comp is complications. Disch is discharge. TIA is transient ischemic attack. CC is complications and/or comorbidities.Cath is catheterization. G.I. is gastrointestinal. Misc is miscellaneous.

SOURCE: Buczko, W., Health Care Financing Administration, 1993.

ized by technologically complex surgical conditions, many of which are treated primarily in teaching hospitals. As with initial stays, a majority of the most frequently occurring conditions in final stays are cardiovascular conditions (52 percent of all transfer episodes). In contrast to initial stays, 54.3 percent of final stays in MDC 5 were for surgical conditions and 45.7 percent were for medical conditions. As shown in Table 3, the most frequently occurring condition in final stays is a technologically intense surgical DRG, DRG 106 (Coronary Bypass w Cardiac Cath) which accounted for 7.9 percent of final stays. DRG 112 (Percutaneous Cardiovascular Procedures) and DRG 107 (Coronary Bypass w/o Cardiac Cath), which account for 6.8 percent and 5.7 percent of final stays, respectively, are also associated with technologically intense surgical procedures. Other conditions accounting for significant shares of initial stays were DRG 124 (Circulatory Disorders except AMI w Cardiac Cath and Complex Diagnosis), DRG 125 (Circulatory Disorders except AMI w Cardiac Cath w/o Complex Diagnosis), and DRG 14 (Specific Cerebrovascular Disorders except TIA).

The data in Tables 2 and 3 show that while initial admissions in a transfer episode are often for medical conditions (as evidenced by the DRG weight for these conditions), final stays are usually for surgical procedures which are frequently complex, technology-intensive, and often regionalized (Hughes, Hunt, and Luft, 1987). Earlier, the shift of transfer patients from medical DRGs in their initial stay to surgical DRGs in the final stay was noted for cardiovascular conditions (MDC 5).

Table 3

Most Frequent Diagnosis-Related Groups (DRGs) for Medicare Transfers: Transfer Hospitalizations, 1987

DRG Code	Description	Transfer Cases	Percent of Transfers	Percent of Total Discharges
106	Coronary Bypass w Cardiac Cath	12,102	7.9	0.6
112	Percutaneous Cardiovascular Procedures	10,354	6.8	1.0
107	Coronary Bypass w/o Cardiac Cath	8,729	5.7	0.4
124	Circulatory Disorders except AMI, w Cardiac Cath and Complex Diagnosis	7,528	4.9	0.8
125	Circulatory Disorders except AMI, w Cardiac Cath w/o Complex Diagnosis	7,245	4.8	1.1
14	Specific Cerebrovascular Disorders except TIA	4,578	3.0	3.3
122	Circulatory Disorders w AMI w/o C.V. Comp Disch Alive	4,477	2.9	1.3
121	Circulatory Disorders w AMI and C.V. Comp Disch Alive	3,733	2.5	1.4
116	Perm Cardiac Pacemaker Implant w/o AMI, Heart Failure or Shock	3,609	2.4	0.5
127	Heart Failure and Shock	3,225	2.1	5.3
82	Respiratory Neoplasms	2,445	1.6	0.9
468	Extensive O.R. Procedure Unrelated to Principal Diagnosis	2,417	1.6	1.3
1	Craniotomy Age >17 except for Trauma	2,271	1.5	0.3
138	Cardiac Arrhythmia and Conduction Disorders w CC	2,265	1.5	2.1
123	Circulatory Disorders w AMI, Expired	2,135	1.4	0.7
148	Major Small And Large Bowel Procedures w CC	1,914	1.3	1.3
409	Radiotherapy	1,905	1.3	0.1
89	Simple Pneumonia/Pleurisy Age >17 w CC	1,826	1.2	3.4
104	Cardiac Valve Procedures w Cardiac Cath	1,782	1.2	0.1
315	Other Kidney and Urinary Tract O.R. Procedures	1,723	1.1	0.3

NOTES: Inpatient stays only. No excluded units. Cath is catheterization. AMI is acute myocardial infarction. TIA is transient ischemic attack. C.V. is cardiovascular. Comp is complications. Disch is discharge. Perm is permanent. O.R. is operating room. CC is complications and/or comorbidities.

SOURCE: Buczko, W., Health Care Financing Administration, 1993.

This pattern of DRG reassignment is not unique to cardiovascular conditions. For nervous system conditions (MDC 1, DRGs 1-35), 96.3 percent of initial stays were for medical conditions whereas for final stays, 68.1 percent of hospitalizations were for medical conditions and 31.9 percent were for surgical conditions. For hepatobiliary system and pancreas disorders (MDC 7, DRGs 191-208), 82.1 percent of initial stays were for medical conditions, whereas for final stays, 34.9 percent of hospitalizations were for medical conditions and 65.1 percent were for surgical conditions.

Table 4

Most Frequent Transfer Stay Diagnosis-Related Groups (DRGs) for DRG 140 Transfers: 1987

DRG Code	Description	Number of Cases	Percent of Transfers
106	Coronary Bypass w Cardiac Cath	5,269	25.3
125	Circulatory Disorders except AMI w Cardiac Cath w/o Complex Diagnosis	3,818	18.4
124	Circulatory Disorders except AMI w Cardiac Cath and Complex Diagnosis	3,457	16.6
112	Percutaneous Cardiovascular Procedures	3,233	15.5
107	Coronary Bypass w/o Cardiac Cath	1,092	5.3
140	Angina Pectoris	624	3.0
122	Circulatory Disorders w AMI w/o C.V. Comp Disch Alive	452	2.3

NOTES: Inpatient stays only. No excluded units. Cath is catheterization. AMI is acute myocardial infarction. C.V. is cardiovascular. Comp is complication. Disch is discharge.

SOURCE: Buczko, W., Health Care Financing Administration, 1993.

Table 5

Most Frequent Transfer Stay Diagnosis-Related Groups (DRGs) for DRG 122 Transfers: 1987

DRG Code	Description	Number of Cases	Percent of Transfers
106	Coronary Bypass w Cardiac Cath	3,187	22.4
112	Percutaneous Cardiovascular Procedures	2,781	19.5
122	Circulatory Disorders w AMI w/o C.V. Comp Disch Alive	2,523	17.7
107	Coronary Bypass w/o Cardiac Cath	1,591	11.2
121	Circulatory Disorders w AMI and C.V. Comp Disch Alive	1,082	7.6
125	Circulatory Disorders except AMI w Cardiac Cath w/o Complex Diagnosis	729	5.1
124	Circulatory Disorders except AMI w Cardiac Cath and Complex Diagnosis	595	4.2
123	Circulatory Disorders w AMI, Expired	512	3.6
109	Other Cardiothoracic Procedures w/o Pump	257	1.7

NOTES: Inpatient stays only. No excluded units. Cath is catheterization. AMI is acute myocardial infarction. C.V. is cardiovascular. Comp is complications. Disch is discharged.

SOURCE: Buczko, W., Health Care Financing Administration, 1993.

Table 6

Most Frequent Transfer Stay Diagnosis-Related Groups (DRGs) for DRG 121 Transfers: 1987

DRG Code	Description	Number of Cases	Percent of Transfers
106	Coronary Bypass w Cardiac Cath	1,946	17.5
121	Circulatory Disorders w AMI and C.V. Comp Disch Alive	1,827	16.4
112	Percutaneous Cardiovascular Procedures	1,099	9.9
122	Circulatory Disorders w AMI w/o C.V. Comp Disch Alive	1,083	9.7
123	Circulatory Disorders w AMI, Expired	979	8.8
107	Coronary Bypass w/o Cardiac Cath	907	8.1
124	Circulatory Disorders except AMI w Cardiac Cath and Complex Diagnosis	533	4.8
125	Circulatory Disorders except AMI w Cardiac Cath w/o Complex Diagnosis	390	3.5
104	Cardiac Valve Procedures w Cardiac Cath	252	2.3
127	Heart Failure & Shock	225	2.0

NOTES: Inpatient stays only. No excluded units. Cath is catheterization. AMI is acute myocardial infarction. C.V. is cardiovascular. Comp is complications. Disch is discharge.

SOURCE: Buczko, W., Health Care Financing Administration, 1993.

The data in Tables 4-9 show the most frequently occurring final stay DRGs for the five most frequently occurring initial stay DRGs. For DRG 140 (Table 4), DRG 122 (Table 5), and DRG 121 (Table 6), transfers often result in Coronary Bypass w or w/o Cardiac Cath (DRGs 106, 107) or Percutaneous Cardiovascular Procedures (DRG 112), which are often regionalized in major teaching hospitals. In comparison, transfers for DRG 127 (Table 7), although often ending in final stays for intense surgical conditions, often have less intense final stays than DRGs 140, 122, and 121.

For DRG 14 (Table 8), 48.1 percent of final stays were also for DRG 14. However, 13.3 percent of final stays were for DRG 1 (Craniotomy Age >17 except for Trauma). Rehabilitation (for recovering stroke patients) (DRG 462) accounted for 6.9 percent of final stays. However, transfer for rehabilitation is more frequent than the data in Table 9 suggest, because many of these transfers are to excluded units. Table 9 shows that when transfers for excluded units are also considered, 53 percent of transfers for DRG 14 are for Rehabilitation.

Table 7

Most Frequent Transfer Stay Diagnosis-Related Groups (DRGs) for DRG 127 Transfers: 1987

DRG Code	Description	Number of Cases	Percent of Transfers
127	Heart Failure & Shock	1,490	19.2
124	Circulatory Disorders except AMI w Cardiac Cath and Complex Diagnosis	1,073	13.9
104	Cardiac Valve Procedures w Cardiac Cath	560	7.2
106	Coronary Bypass w Cardiac Cath	319	4.1
123	Circulatory Disorders w AMI, Expired	305	3.9
315	Other Kidney and Urinary Tract O.R. Procedures	216	2.8
138	Cardiac Arrythmia & Conduction Disorders w CC	208	2.7
116	Permanent Pacemaker Implant w/o AMI, Heart Failure or Shock	207	2.7
109	Other Cardiothoracic Procedures w/o Pump	206	2.7
144	Other Circulatory System Diagnoses w CC	201	2.6

NOTES: Inpatient stays only. No excluded units. AMI is acute myocardial infarction. Cath is catheterization. O.R. is operating room. CC is complications and/or comorbidities.

SOURCE: Buczko, W., Health Care Financing Administration, 1993.

Table 8

Most Frequent Transfer Stay Diagnosis-Related Groups (DRGs) for DRG 14 Transfers, Inpatient Stays Only[1]: 1987

DRG Code	Description	Number of Cases	Percent of Transfers
14	Specific Cerebrovascular Disorders except TIA	3,011	48.1
1	Craniotomy Age >17 except for Trauma	829	13.3
462	Rehabilitation	530	6.9
15	Transient Ischemic Attack & Precerebral Occlusions	231	3.7
5	Extracranial Vascular Procedures	182	2.9
2	Craniotomy for Trauma Age >17 O.R. Procedures	161	2.6
468	Extensive O.R. Procedure Unrelated to Principal Diagnosis	132	2.1
12	Degenerative Nervous System Disorders	113	1.8

[1]No excluded units.

NOTES: TIA is transient ischemic attack. O.R. is operating room.

SOURCE: Buczko, W., Health Care Financing Administration, 1993.

CLINICAL APPROPRIATENESS OF TRANSFERS

The primarily clinical nature of the inpatient transfers studied here is underscored by a comparison of the most frequently occurring DRGs for initial and final stays with the clinical typology created by the Codman Research Group, Inc. (1990). This classification system (shown in Table 10) groups DRGs into seven case types developed to analyze changes in the types of inpatient services used by rural Medicare beneficiaries. Medical and surgical DRGs were each divided into two groups based on whether these conditions are usually treated in local hospitals or out-of-area facilities. DRGs for minor surgical procedures treatable in outpatient and inpatient settings, technologically intensive cases treated in teaching hospitals and a few RRCs, and a set of conditions identified by Wennberg and Gittelsohn (1982) as relatively insensitive to practice style variation were pulled out of the groups previously noted and placed into separate categories. This typology is useful in this analysis because comparison of the data presented earlier

with this typology allows one to determine if the conditions treated in initial and final stays are routine conditions treatable in most hospitals (locally) or are tertiary care cases commonly treated in specialized settings.

Comparison of the data in Table 2 with this list shows that one-half of the conditions most frequently associated with initial stays in a transfer episode were medical conditions amenable to local treatment. Almost all of the remaining DRGs represented mixed severity medical conditions or low variation conditions amenable to local hospital treatment if these cases are not too severe.

Further, comparison of the list of most frequent DRGs for final hospital stays (given in Table 3) shows that the first three DRGs (106, 107, and 112) are technically based procedures that are usually treated only in teaching hospitals. Seven of the 20 conditions appearing in Table 3 are categorized in Table 10 as technically based conditions. Most of the remaining conditions are either surgical conditions of varying technological complexity or low variation conditions where transfer may well be justified, depending on the severity of the condition.

Overall, this comparison appears to reinforce the clinical appropriateness (at face value) of the transfers examined here. Although initial stays were primarily for medical conditions, subsequent reevaluation of the patient or change in the health status of the patient prompted the need for surgical treatment that could best be performed in a hospital with greater specialization in such cases.

HOSPITAL CHARACTERISTICS AND TRANSFERS

The description of variation in transfer stays by condition (DRG) and the implications of these data for appropriate treatment suggest that the incidence of initial and final stays in transfer episodes should systematically vary across groups of hospitals. Data on variation in initial and final stays by hospital characteristic are presented in Tables 11-14.

The data in Tables 11 and 12 highlight an important locational dimension associated with transfer episodes. Small hospitals and rural hospitals (especially SCHs) tended to send transfers to large urban hospitals of 200 beds or more, and received relatively few transfers. In con-

Table 9

Most Frequent Transfer Stay Diagnosis-Related Groups (DRGs) for DRG 14 Transfers, All Medicare Short-Stay Discharges[1]: 1987

DRG Code	Description	Number of Cases	Percent of Transfers
462	Rehabilitation	10,409	53.0
14	Specific Cerebrovascular Disorders except TIA	4,116	21.0
12	Degenerative Nervous System Disorders	1,723	8.8
1	Craniotomy Age >17 except for Trauma	832	4.2
15	Transient Ischemic Attack & Precerebral Occlusions	239	1.2
5	Extracranial Vascular Procedures	182	0.9
468	Extensive O.R. Procedure Unrelated to Principal Diagnosis	177	0.9

[1]Includes TEFRA-excluded facilities.

NOTES: TIA is transient ischemic attack. O.R. is operating room. TEFRA is Tax Equity and Fiscal Responsibility Act of 1982.

SOURCE: Buczko, W., Health Care Financing Administration, 1993.

Table 10

Diagnosis-Related Group (DRG) Case Typology

Case Type	Description	DRGs
Medical-Local	Local hospitals account for a majority of admissions. Includes 8 of the 10 most frequently admitted medical conditions among Medicare beneficiaries.	15, 31-33, 43-48, 64-69, 71-74, 78-81, 83-90, 94-97, 99-102, 127-129, 132-134, 138-143, 176-179, 182, 183, 188-190, 202, 204, 205-207, 235-237, 243, 250-255, 271-284, 296-298, 320-324, 346-350, 352, 366-369, 395-399, 425, 426, 444-451, 454, 455, 461-467.
Medical-Mixed	Referral based on severity. One-third or more of admissions are to rural referral centers or large urban hospitals.	9-13, 16-30, 34, 35, 82, 92-93, 124-126, 130, 131, 135-137, 144, 145, 172, 173, 180, 181, 203, 238-242, 244-249, 256, 294, 295, 299-301, 318, 319, 325-333, 403-405, 412-414, 416-423, 427-438, 452, 453, 473.
Surgical-Local	Local hospitals account for a majority of admissions. Includes many of the highest volume surgical procedures among Medicare beneficiaries.	154-162, 164-167, 191-194, 199-201, 209, 218, 219, 226, 227, 267-270, 306, 307, 336-339, 341-345, 351, 353-362, 365, 471.
Surgical-Mixed	Referral based on severity. One-third or more of admissions are to rural referral centers or large urban hospitals.	4, 5, 7, 8, 75-77, 146, 147, 150-153, 168-171, 213, 216, 217, 223, 224, 228, 232-234, 257-260, 285-293, 302-305, 308-313, 315, 334, 335, 392-394, 397-402, 406-408, 439-443, 468.
Technical-Based	Large urban and rural hospitals predominantly provide technologically sophisticated procedures and treatments.	1-3, 103-116, 119, 120, 214, 215, 263-266, 316, 317, 409, 410, 456-460, 472.
In-Out Option	Procedures commonly treated either on an inpatient or an outpatient basis.	6, 36-40, 42, 49-63, 117, 118, 185-187, 221, 222, 225, 229, 261, 262, 271-276, 280, 281, 283, 284, 363.
Low Variation	Conditions and procedures where hospitalization is needed for treatment. Little practice style variation is evident. Local hospitals generally account for most of these admissions.	14, 121-123, 148, 149, 159-162, 174, 175, 195-198, 210-212, 230, 231.

SOURCE: Codman Research Group, Inc. 1990.

Table 11

Comparison of Sending and Receiving Transfer Admissions and All Medicare Admissions, by Hospital Type

Hospital Type	Admissions		
	Sending	Receiving	All Medicare
	In Percent		
Large Urban Area (MSA Population 1 Million or More)	28.7	40.6	40.7
Other Urban Area (MSA Population Fewer Than 1 Million)	26.8	49.4	37.1
Rural Area (Non-MSA)	44.4	10.0	22.2
Urban, 0-99 Beds	7.8	0.9	4.4
Urban, 100-199 Beds	13.6	5.1	12.4
Urban, 200-299 Beds	13.5	13.2	16.5
Urban, 300-499 Beds	15.4	31.5	26.6
Urban, 500 Beds or More	5.8	38.6	18.2
Rural, 0-49 Beds	10.3	0.5	3.2
Rural, 50-99 Beds	14.6	1.0	5.8
Rural, 100-149 Beds	9.2	1.7	5.0
Rural, 150-199 Beds	4.1	1.6	2.9
Rural, 200 Beds or More	4.7	5.0	4.7
Voluntary	60.6	78.6	72.6
Proprietary	14.1	8.6	12.3
Government	25.3	12.8	15.1
Major Teaching (.25 or More Residents per Bed)	3.7	21.4	8.6
Minor Teaching (Fewer Than .25 Residents per Bed)	18.0	49.0	33.8
Non-Teaching	78.3	29.6	57.5
Disproportionate Share	25.6	45.4	34.0
Sole Community Hospital (SCH)	4.7	0.8	2.2
Rural Referral Center (RRC)	5.7	6.0	5.6
Both SCH and RRC	0.9	0.4	0.6

NOTE: MSA is metropolitan statistical area.

SOURCE: Buczko, W., Health Care Financing Administration, 1993.

trast, large urban hospitals, especially teaching hospitals, were the predominant recipients of transfers.

As Table 12 indicates, 44.4 percent of initial transfers originated from hospitals located in rural areas, whereas 28.7 percent and 26.8 percent of transfer episodes originated in hospitals located in large or other urban areas, respectively. Because only 22 percent of all discharges for aged Medicare beneficiaries are from rural hospitals, it is apparent that Medicare patients are transferred out at a higher rate in rural hospitals than in urban hospitals.

Only 10 percent of transfer episodes end in rural hospitals, whereas 40.6 percent and 49.4 percent of transfer episodes end in large or other urban hospitals, respectively. Table 12 also shows that, although most transfer episodes beginning in hospitals in large urban areas end in large urban area hospitals and most transfer episodes beginning in hospitals in small urban areas end in small urban area hospitals, most transfer episodes beginning in rural hospitals end in urban hospitals in small metropolitan statistical areas (MSAs) (fewer than 1 million persons).

Table 12

Initial and Final Hospitalizations for Medicare Transfers, by Urban and Rural Location

Originating Hospital Type	Total	Transfer Hospital Type		
		Large Urban	Other Urban	Rural
		Percent		
Total	—	40.6	49.4	10.0
Large Urban	28.7	27.2	1.2	0.3
Other Urban	26.8	6.1	19.3	1.4
Rural	44.4	7.3	28.8	8.3

SOURCE: Buczko, W., Health Care Financing Administration, 1993.

Similarly, examination of origin and destination of transfer episodes by location and bed size shows a similar outflow of patients transferred to urban hospitals. The data in Table 11 mirror the data discussed earlier. Rural hospitals, especially those with 100 beds or fewer, initiate a disproportionate percentage of transfer episodes (relative to the 9 percent of all aged Medicare discharges these hospitals account for). Transfer episodes predominantly (83.3 percent) end in urban hospitals with 200 beds or more.

Table 13 shows that, regardless of location and bed size of originating hospital, most transfer patients are sent to urban hospitals with 200 beds or more. While small urban hospitals usually send transfers to large urban hospitals, rural hospitals regardless of size send transfers out of rural areas to urban hospitals. Although some transfers out of small rural hospitals were sent to larger rural hospitals (often RRCs), most transfers from rural hospitals were to hospitals with 200 beds or more in urban areas.

SCHs initiate 4.7 percent of transfer episodes but receive a negligible percentage (0.8 percent) of transfers (Table 11). Transfers initiated by SCHs are usually sent to either RRCs or urban teaching hospitals.

RRCs receive 6 percent of transfer episodes, but they also initiate 5.7 percent of transfer episodes. As shown in Table 14, RRCs receive 88.9 percent of transfer admissions from other rural hospitals; 60.4 percent originated in rural hospitals with

Table 13

Initial and Final Hospitalizations for Medicare Transfers, by Urban and Rural Location and Bed Size

Originating Hospital Type	Total	Transfer Hospital Type			
		Urban		Rural	
		Fewer Than 200 Beds	200 Beds or More	Fewer Than 100 Beds	100 Beds or More
		Percent			
Total	—	6.1	84.0	1.5	8.4
Urban, Fewer Than 200 Beds	21.7	1.8	19.4	0.1	0.4
Urban, 200 Beds or More	34.9	2.2	31.6	0.5	0.6
Rural, Fewer Than 100 Beds	25.2	1.5	17.8	0.6	5.3
Rural, 100 Beds or More	18.2	0.5	15.2	0.3	2.1

SOURCE: Buczko, W., Health Care Financing Administration, 1993.

Table 14

Transfers Sent to Other Hospitals from Rural Referral Centers (RRCs) and Received from Other Hospitals at RRCs, by Hospital Type

Hospital Type	Percent of Transfers	
	Sent to Other Hospitals	Received from Other Hospitals
Total	100.0	100.0
Urban, Fewer Than 200 Beds	2.7	5.1
Urban, 200 Beds or More	82.6	6.0
Rural, Fewer Than 100 Beds	2.4	60.4
Rural, 100 Beds or More	12.3	28.5

SOURCE: Buczko, W., Health Care Financing Administration, 1993.

100 beds or fewer, and 28.5 percent originated in rural hospitals with 100 beds or more. In comparison, 82.6 percent of transfers from RRCs are to urban hospitals with 200 beds or more (often teaching hospitals). RRCs may not be equipped to provide the most intense modes of inpatient care, as evidenced by the extent of transfers to large urban hospitals, which are often the only sources of such care. Further research is needed describing the geography of transfer and referral patterns from rural areas to determine the proximity of sending and receiving hospitals and types of hospitals involved (SCH, RRC, major or minor teaching hospital).

Although most transfers originate from voluntary hospitals, government hospitals initiated 25.3 percent of transfer episodes while accounting for only 15 percent of discharges for aged Medicare beneficiaries. Proprietary hospitals initiated 14.1 percent of transfers while accounting for 12 percent of discharges for aged Medicare beneficiaries. Thus, it does not appear that proprietaries with their increased sensitivity to profitability are more active in transferring patients.

Relatively few transfers are received by proprietary or government hospitals. This does not necessarily reflect aversion to receiving transfers among these hospitals, but partially reflects the predominantly voluntary ownership status of teaching hospitals.

As expected, most transfers (78.3 percent) were sent from non-teaching hospitals (Table 11). Most were received at teaching hospitals, with 49 percent received at minor teaching hospitals. This reflects transfers from rural hospitals to nearby teaching hospitals in smaller urban areas and the relative number of major and minor teaching hospitals in the United States. When compared with the percent of discharges for all aged Medicare beneficiaries, major teaching hospitals received disproportionately more transfers than either minor teaching or non-teaching hospitals.

DSHs, while accounting for 34 percent of discharges for aged Medicare beneficiaries, initiated 25.6 percent of transfer episodes but received 45.4 percent of transfer episodes. This reflects the substantial overlap between teaching hospitals and DSHs.

SUMMARY

The data presented show that while initial stays of transfer episodes are slightly less severe and less costly than the average Medicare discharge, final stays in the

transfer episode are far more severe and costly than both initial stays and the average Medicare stay. The major reason for the observed differences between initial and final stays is the increased incidence of surgery and number of procedures in the final stay. As a result, day and cost outliers are far more frequent in the final stay of the transfer episode, and total charges, ancillary charges, ICU charges, CCU charges, and OR charges are far greater in the final stay of the transfer episode.

Small hospitals and rural hospitals (especially SCHs) were disproportionate senders of transfers and tended to receive relatively few transfers. In contrast, large urban hospitals received an exceptionally large percentage of transfer cases. Relatively few transfers were received by rural hospitals.

Although proprietary hospitals sent far more transfers than they received, the ratio of transfers sent and received was greater for government hospitals. Many of these transfers were received at voluntary hospitals.

As expected, most transfers were sent from non-teaching hospitals. Most were received at teaching hospitals, with a surprising percentage received at light rather than heavy teaching hospitals. Similarly, DSHs also received a high rate of transfers.

Transfer episodes were usually admitted initially for non-surgical conditions. The most frequently occurring conditions in the initial stay were cardiovascular. The final stay in the transfer episode often is characterized by an increase in severity, as indicated both by the higher weight of the DRG assigned to the final stay and the shifting of patients from medical DRGs in the initial stay to surgical DRGs in the final stay. The most frequent DRGs in the final stay of the transfer episode were technologically intensive cardiovascular surgery conditions.

The picture of transfer episodes emerging from these data suggests that Medicare transfers involve cases where surgical care frequently requires specialized treatment. The transfer of patients across inpatient facilities is motivated by primarily clinical concerns related to appropriateness and quality of care. The clinical rather than economic nature of these transfers is underscored by comparison of the most frequently occurring DRGs for initial and final stays with the clinical typology created by the Codman Research Group, Inc., which supports the clinical appropriateness of the transfers documented.

"Regionalization" of treatment for conditions requiring specialized care has been argued for, with respect to quality of care maximization, by Hughes, Hunt, and Luft (1987) and Maerki, Luft, and Hunt (1986). These data suggest that, especially in rural areas, some amount of regionalization already exists. Further research is needed to determine the geography of such "de facto" networks and whether the transfer of patients to specific RRCs or urban major or minor teaching hospitals is based upon geographic proximity, availability of specialized services, or quality of care differences.

These data do not support the supposition that transfers of hospitalized Medicare beneficiaries occur for solely fiscal reasons. This is not to suggest that patient skimming and dumping do not occur. Rather, further examination of admissions from emergency rooms, refusals by hospitals to admit patients (Himmelstein

et al., 1984; Reed, Cawley, and Anderson, 1986; Schiff et al., 1986), and use of PPS-excluded units and facilities to maximize reimbursement (Freiman and Sederer, 1990) would appear of more utility than examination of transfers of patients from one inpatient setting to another.

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Reprint requests: William Buczko, Ph.D., Office of Research and Demonstrations, 2-B-14 Oak Meadows Building, 6325 Security Boulevard, Baltimore, Maryland 21207.