

# Toward a prospective payment system for ambulatory surgery

by Joanna Lion, James Vertrees, Alan Malbon, Ann Collard, and Peter Mowschenson

*In this article, ambulatory surgery among the aged Medicare population in 1985 is examined. Total hospital facility charges for ambulatory surgery in that year were estimated at \$1.8 billion, with about one-half of that amount involving cataract surgery. The possibility of using diagnosis-related groups for a prospective payment system for ambulatory surgery was examined and was rejected for two reasons: (1) about 20 percent of the dollar volume of hospital-based ambulatory surgery fell into medical diagnosis-related groups and (2) the ratio of*

*inpatient diagnosis-related group weight to outpatient billed charges for the ambulatory procedures falling into a given diagnosis-related group varied more than tenfold, making diagnosis-related group weights impossible to use in a consistent manner. A newly developed version of ambulatory visit groups and the even newer ambulatory patient groups were then considered as an alternative for a prospective payment system. These are briefly described.*

## Introduction

The purpose of this article is to evaluate the feasibility of using diagnosis-related groups (DRGs) for a prospective payment system for hospital outpatient ambulatory surgery for Medicare beneficiaries. Although the DRGs were neither designed nor intended for this purpose, the simplicity of their use in this context, if feasible, would be of obvious appeal. In addition, an assessment of this option was of interest to staff in the Executive Office of Management and Budget and must therefore be reckoned with in designing any prospective payment system.

## Background

This analysis is especially timely because Congress has mandated that the Health Care Financing Administration (HCFA) design a prospective payment system for ambulatory surgery to be implemented in 1990. (This system was initially mandated by the Omnibus Budget Reconciliation Act of 1986 (OBRA 86) for April 1, 1989, with recommendations concerning implementation of a full prospective payment mechanism for ambulatory surgery services by October 1, 1989. An interim system is in place pending development of a final system.) Extension of the prospective payment system to all hospital outpatient ambulatory care provided to Medicare patients is required by 1991.

Although the initial prospective payment system is limited to ambulatory surgery in hospital outpatient departments (OPDs), a reimbursement system for ambulatory surgery cannot be designed in a vacuum. This is because at least four additional issues, three of them also mandated for congressional examination, impact on the design of a payment system for hospital-based ambulatory surgery.

The first congressional requirement is that a "blended rate" be used in reimbursing hospital OPDs for doing surgery that is also done in freestanding ambulatory surgery centers. Until October 1987, payment for hospital OPDs was on a cost basis. Current payment is based on

the least of the hospital's reasonable cost, customary charges, or a blend of the hospital's reasonable cost and the ambulatory surgery center's prospective payment rate. Since October 1988, this blend has been 50-50.

Effective October 1, 1988, payment for OPD radiology is also based on a similar blended amount that is the lowest of cost, charges, or 62 percent of the radiologists' global fee schedule. Effective October 1, 1989, approximately 100 other diagnostic services—such as EKGs—are paid on the least of cost, charges, or a 65-35 blend of OPD cost and the technical component of physician's office charges.

Meanwhile, the Prospective Payment Assessment Commission (ProPAC) has suggested that a regional factor in ambulatory surgery reimbursement be included so that payment would be made one-third on national hospital cost estimates, one-third on the hospital's own cost estimates, and one-third on the ambulatory surgery center blended rate. Despite all these changes in reimbursement methodology, there is obviously still considerable financial incentive for hospitals to deliver as much care as possible on an outpatient basis although this incentive is not as strong as in the first 4 years of the prospective payment system.

The second congressional mandate is, of course, the extension of a prospective payment system to all hospital outpatient department care for Medicare beneficiaries by 1991. Although hospital-based ambulatory surgery is highly visible, it actually accounts, in both volume and cost, for a minority of the care delivered to Medicare beneficiaries in hospital OPDs. In 1985, visits involving a surgical procedure were estimated at about 5 percent of all visits and about one-quarter of all billed charges (Bowen, 1988). For fiscal year 1989, ambulatory surgery as a percent of total billed charges had increased to approximately 35 percent of all hospital OPD care (Brandeis University, 1990).

The third congressionally mandated requirement involves the whole issue of reimbursement for physicians' fees. This broad issue is currently the subject of a large HCFA-funded project at Harvard. Investigators of the physician fee project are in the process of attaching relative values to the entire range of services performed by physicians—including, of course, surgery performed in an ambulatory setting (Boyle, 1988; Hsiao, 1988). This mandate does not technically affect the first and second mandates, because the first two are specific to the

Research for this article was funded by the Health Care Financing Administration under Cooperative Agreement No. 17-C-99026.

Reprint requests: Joanna Lion, Ph.D., Heller School, Brandeis University, Waltham, Massachusetts 02254.

facility component of hospital OPD care, whereas this one is specific to the professional component of all care rendered across all settings, whether hospital inpatient, hospital outpatient, or physicians' private offices. Nevertheless, the issues do overlap, to some extent, because physicians doing surgery in their private offices (rather than setting up ambulatory surgery centers) pay all of their expenses out of the professional component instead of billing separately for both facility and professional components as hospital OPDs and freestanding surgery centers do.

Finally, although only ambulatory care reimbursement for Medicare beneficiaries falls under the congressional mandate, given Medicare's high visibility in the health care financing arena, any system designed for Medicare should be attractive to Medicaid and to private third-party payers as well.

Keeping in mind these real-life constraints, one alternative that must be considered for a prospective payment system for ambulatory surgery is examined here. This alternative is simply the extension of the current inpatient prospective payment system using diagnosis-related groups (DRGs) to hospital-based ambulatory surgery. The purpose of this article is to evaluate the feasibility of using DRGs in a prospective payment system for hospital outpatient surgery for Medicare beneficiaries. This has been done only once before, using Canadian rather than American data (Roos and Freeman, 1989). Analysis of the Canadian data revealed that many procedures were done on an outpatient ambulatory basis in that country and were grouped in both medical and surgical DRGs. In Canada, cataract surgery was still done on an inpatient basis in 1982-84 when Canadian data were collected.

American data used to analyze the case mix of ambulatory surgery for Medicare beneficiaries using DRGs are provided for the first time using 1985 data. Approximately 65,000 visits for ambulatory surgery in hospital OPDs were analyzed. The visits were representative of visits for ambulatory surgery procedures by the entire U.S. aged Medicare population in calendar year 1985. In that year, 19.9 percent of all surgery was performed on an outpatient basis in the hospital setting and an additional 17.3 percent in a physician's office. This compares with 4.7 percent in 1982 in the OPD and 13.4 percent in a physician's office (Fisher, 1987; Schramm and Gabel, 1988). Assuming the same trend, in 1989, more than one-half of all surgery was performed on an outpatient basis, considering both OPDs and physician offices together. Ambulatory surgery centers are considered part of a physician's office-based practice in the statistics just quoted.

## Data

Data used in this article are based on information taken from the HCFA 1985 hospital outpatient department 5-percent sample file. For the analysis, visits with at least one valid *International Classification of Diseases, 9th Revision, Clinical Modification* (ICD-9-CM) (Public Health Service and Health Care Financing Administration, 1980) ambulatory surgery procedure code for the Medicare population 65 years of age or over were selected. A valid surgery procedure is defined as any

procedure that falls within the 01.00-86.99 range of ICD-9-CM procedures. All of the procedures analyzed were performed on an ambulatory basis in hospital OPDs at a time when ICD-9-CM procedure coding was still a Medicare requirement for outpatient as well as inpatient surgical procedures.

The 1985 hospital outpatient department file consists of all Medicare beneficiaries whose social security number ends in one of five particular combinations of the last two digits and who had at least one visit to a hospital outpatient department in calendar year 1985 (i.e., 5 percent of all visits). Although this file is representative of all Medicare visits, given that the focus of this research was outpatient surgery for the elderly, certain categories of visits were eliminated. These included the following:

- Visits for Medicare beneficiaries under 65 years of age.
- Nonsurgical visits.
- Visits with less than \$25 in total billed charges.
- Visits lacking a valid ICD-9-CM diagnostic code or a valid ICD-9-CM procedure.
- Bills with more than one visit (allowed in 1985, but subsequently proscribed by HCFA).

The results of the deletions reduced the actual visits by nearly one-half, so that a multiplier of 36.55 rather than of 20.00 was required to project the actual visits and total dollars to the entire aged Medicare population. Although the reduced sample is less than random, it is still almost certainly roughly representative of the aged Medicare population. About 10 percent of the visits but only 6 percent of the dollar volume for surgery were for Medicare beneficiaries under 65 years of age. This group was excluded from the projections.

About one-quarter of the visits had more than one procedure; for these visits, the more resource-intensive

**Table 1**  
**Percent of total billed charges for ambulatory surgery procedures, by surgical and medical diagnosis-related groups (DRGs)**

Body system	All DRGs	Surgical DRGs	Medical DRGs
Percent of total billed charges			
Total	100.0	78.6	21.4
Eye	59.4	57.8	1.6
Digestive	10.3	3.1	7.2
Skin and subcutaneous tissue	6.7	5.4	1.3
Renal and kidney	4.9	1.5	3.5
Other	18.7	10.9	7.8
Total billed charges projected to aged Medicare population in millions			
Total	\$1,748	\$1,374	\$374
Eye	1,038	1,010	28
Digestive	180	54	126
Skin and subcutaneous tissue	117	94	23
Renal and kidney	326	26	136
Other	326	190	136

NOTE: The projection to the entire aged Medicare population uses a multiplier of 36.55 rather than of 20 because of losses resulting from technical problems with the file.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy; Data from the 1985 hospital outpatient department 5-percent sample file.

procedure was chosen, so that each visit is represented only once. This selection process was done for two reasons. One is that the bills for visits with multiple procedures include all charges for all procedures; charges are not apportioned to the separate procedures but are totaled together. The other is that, for inpatient stays where more than one surgical procedure was performed, the DRG is automatically assigned using the more resource-intensive procedure. (About two-thirds of ICD-9-CM double coding of procedures involves cataract surgery with a separate code for lens implantation; this problem is resolved with one code using Current Procedural Terminology, Version 4 (CPT-4) of the HCFA Common Procedure Coding System (HCPCS) which is now mandated. HCPCS was not available until fiscal year 1988 for the ambulatory surgery portion of hospital OPD billing records.)

## Descriptive analysis

Visits for ambulatory surgery amounted to about \$1.8 billion in total billed charges when projected upward to the entire aged Medicare population. The percents of these visits that were for medical DRGs and those for

surgical DRGs are shown in Table 1. Nearly 80 percent of the charges for visits with procedures were grouped into surgical DRGs, a preliminary indication that a prospective payment system using the DRG approach might be feasible for a majority of hospital outpatient ambulatory surgery. (Only 60 percent of all visits for surgery were in surgical DRGs, however. Diagnostic endoscopies were almost entirely in medical DRGs. This type of scoping cost considerably less, on average, than incisional surgery. In any case, total volume measured in dollars rather than in visits appears to be the more useful point of reference.)

In order to examine the feasibility of using DRGs for a payment mechanism for hospital-based ambulatory surgery, the visit data were classified into individual DRGs. The leading DRGs, both medical and surgical, in terms of volume of total visits, mean billed charges, and coefficients of variation, are presented in Table 2. Table 3 displays total visits and total billed charges projected to the Medicare aged population for these DRGs. It should be noted that, although the leading DRGs for ambulatory surgery are ordered by volume of visits in Table 2, this ordering does not hold in Table 3. Even though the first three DRGs for ambulatory surgery

Table 2

### Volume of visits for the top 25 diagnosis-related groups (DRGs) for ambulatory surgery procedures

Surgical (S) or medical (M)	DRG number	DRG description	Total number of visits	Percent of total visits	Mean billed charge	Coefficient of variation
All DRGs			66,848	100.0	\$715.40	1.01
Top 25 outpatient DRGs			42,575	63.7	821.85	.98
Surgical DRG visits in top 25 outpatient DRGs			26,076	61.0	1,134.37	.81
S	39	Lens procedures	16,234	24.3	1,534	.48
M	182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders, over age 69 or with comorbidity	3,874	5.8	288	.84
S	269	Other skin, subcutaneous tissue, and breast, operating room procedures, over age 69 or with comorbidity	3,037	4.5	276	1.07
M	188	Other digestive system diagnoses, over age 69 or with comorbidity	2,079	3.1	307	.71
M	183	Esophagitis, gastroenteritis, and miscellaneous digestive disorders, age 65-69 without comorbidity	1,495	2.2	276	.70
M	47	Other disorders of the eye, age 65 or over without comorbidity	1,352	2.0	527	1.36
S	40	Extraocular procedures, except orbit, age 65 or over	1,275	1.9	573	.85
S	270	Other skin, subcutaneous tissue, and breast, operating room procedures, under age 70 without comorbidity	1,136	1.7	307	1.04
M	189	Other digestive system diagnoses, age 65-69 without comorbidity	1,019	1.5	506	.76
S	262	Breast biopsy and local excision for nonmalignancy	984	1.5	668	.65
M	280	Trauma to the skin, subcutaneous tissue, and breast, over age 69 or with comorbidity	917	1.4	135	1.02
M	174	Gastrointestinal hemorrhage, over age 69 or with comorbidity	818	1.2	287	1.02
M	283	Minor skin disorders, over age 69 or with comorbidity	784	1.2	265	1.08
S	157	Anal procedures, over age 69 or with comorbidity	784	1.2	414	.66
S	6	Carpal tunnel release	744	1.1	653	.51
M	325	Kidney and urinary tract signs and symptoms, over age 69 or with comorbidity	697	1.0	390	.90
M	348	Benign prostatic hypertrophy, over age 69 or with comorbidity	694	1.0	429	.70
S	38	Primary iris procedures	658	1.0	390	.90
M	172	Digestive malignancy, over age 69 or with comorbidity	631	1.0	324	.80
S	42	Intraocular procedures, except retina, iris, and lens	613	1.0	1,032	.85
S	364	Dilatation and curettage, conization, except for malignancy	611	0.9	638	.47
M	467	Other factors influencing health status	569	0.9	280	.96
M	318	Kidney and urinary tract neoplasms, over age 69 or with comorbidity	553	0.8	404	.78
M	331	Other kidney and urinary tract diagnoses, over age 69 or with comorbidity	516	0.8	345	.92
M	320	Kidney and urinary tract infections, over age 69 or with comorbidity	512	0.8	409	.84

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the 1985 hospital outpatient department 5-percent sample file.

Table 3

**Descending order of mean billed charges projected to the Medicare population for the leading 25 diagnosis-related groups (DRGs) for ambulatory surgery procedures**

DRG number	DRG description	Total number of visits in Medicare population	Total billed charges in millions
39	Lens procedures	593,424	\$910.3
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders, over age 69 or with comorbidity	141,577	40.8
269	Other skin, subcutaneous tissue, and breast, operating room procedures, over age 69 or with comorbidity	110,989	30.6
40	Extraocular procedures except orbit, age 65 or over	46,590	26.7
47	Other disorders of the eye, age 65 or over, without comorbidity	49,399	26.0
262	Breast biopsy and local excision for nonmalignancy	35,962	24.0
188	Other digestive system diagnoses, over age 69 or with comorbidity	75,980	23.3
42	Intraocular procedures except retina, iris, and lens	22,403	23.1
189	Other digestive system diagnoses, age 65-69, without comorbidity	37,233	18.8
6	Carpal tunnel release	27,191	17.8
183	Esophagitis, gastroenteritis, and miscellaneous digestive disorders, age 65-69 or with comorbidity	54,627	15.1
364	Dilatation and curettage, conization except for malignancy	22,330	14.2
270	Other skin, subcutaneous tissue, and breast, operating room procedures, under age 70, without comorbidity	41,508	12.7
157	Anal procedures, over age 69 or with comorbidity	28,242	11.7
348	Benign prostatic hypertrophy, over age 69 or with comorbidity	25,359	10.9
325	Kidney and urinary tract signs and symptoms, over age 69 or with comorbidity	25,481	9.9
174	Gastrointestinal hemorrhage, over age 69 or with comorbidity	29,903	8.6
318	Kidney and urinary tract neoplasms, over age 69 or with comorbidity	20,204	8.2
320	Kidney and urinary tract infections, over age 69 or with comorbidity	18,714	7.7
283	Minor skin disorders, over age 69 or with comorbidity	28,657	7.6
172	Digestive malignancy, over age 69 or with comorbidity	23,063	7.5
38	Primary iris procedures	24,040	6.6
331	Other kidney and urinary tract diagnoses, over age 69 or with comorbidity	18,861	6.5
467	Other factors influencing health status	20,791	5.8
280	Trauma to the skin, subcutaneous tissue, and breast, over age 69 or with comorbidity	33,519	4.5
Total billed charges accounted for by top 25 DRGs		NA	\$1,278.9
Percent of total billed charges for surgical procedures accounted for by top 25 DRGs based on \$1.748 billion for patients 65 years of age or over		NA	73.2

NOTE: The projection to the entire aged Medicare population uses a multiplier of 36.55 rather than of 20 because of losses resulting from technical problems with the file. NA is not applicable.

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the 1985 hospital outpatient department 5-percent sample file.

(cataract removal, upper gastrointestinal scoping, and scheduled skin procedures) hold the same order because of their high volume, the order changes drastically after that. Eye procedures other than cataract surgery move into fourth and fifth places, and suturing of wounds moves to last place. This is, of course, because eye procedures cost more individually than do gastrointestinal scopes, and dollar volume is the product of number of visits combined with mean billed charges per visit.

Briefly, one surgical DRG—lens procedures (DRG 39)—accounts for about one-quarter of the volume of visits for surgery and for more than one-half of all billed charges for surgery in the hospital OPD. The lens procedures DRG had a mean billed charge of \$1,534 for the hospital component of the surgery for 1985 and a coefficient of variation that was quite narrow—only 0.48 untrimmed. The remainder of hospital-based ambulatory surgery procedures were fragmented among a number of other DRGs, none of which accounted for even 5 percent of the billed charges for ambulatory surgery. Digestive system endoscopies (DRG 182) were in second place. Although coded in the ICD-9-CM surgical range, considerable controversy exists as to whether scoping is a

surgical procedure. For example, digestive system scopes are performed primarily by medical subspecialists, rather than by surgeons.

### Arguments for diagnosis-related groups

With this as background, the arguments in favor of the DRG approach as a prospective payment system for hospital-based ambulatory care can be stated as follows:

- Hospital OPD charges are still less tightly regulated than inpatient charges; the regulation that does exist tends to be on a piecemeal basis rather than by viewing all of the components of a visit together, as has been done for a hospital stay.
- Some types of surgery—such as cataract removal and lens implantation—were done in 1989 in both an inpatient and a same-day surgery setting.
- A substantial majority of hospital outpatient department surgery was done on an inpatient basis as recently as 5 years ago and, thus, fell into the original design of the DRG system.
- The DRG system is both familiar to hospitals and well entrenched politically for inpatient care.

If it could be demonstrated that the weights currently in use for inpatient surgery DRGs have the same relative resource use in a same-day surgery setting, a complete mechanism for a prospective payment system for ambulatory surgery would already be in place. This system would require only relatively minor changes in hospital reporting, that is, the treatment of ambulatory surgery as a "zero day" stay and its transfer, for reimbursement purposes, to Part A of the Medicare Provider Analysis and Review (MEDPAR) file from the Part B hospital outpatient department file. Even given the arguments against the use of DRGs for this purpose, this approach would, because of its simplicity, have great appeal. Using this methodology, zero day stays could simply have the inpatient weights assigned by HCFA

discounted to accommodate the room and board portion of hospital inpatient expenses.

In the following section, the key issue of weighting surgical DRGs on an inpatient as opposed to an outpatient basis is further explored. The hypothesis is that the ratio of inpatient-to-outpatient service use is constant across DRGs for those DRGs that now contain substantial amounts of outpatient surgery.

## How diagnosis-related groups perform

The results of a first attempt to use weights for DRGs formed by visits for ambulatory surgery without alteration from the inpatient standards are presented in Tables 4 and 5. As is immediately apparent from the ratio of weight to

**Table 4**  
**The 10 leading surgical diagnosis-related groups (DRGs) with ambulatory surgery procedures, by ratio of inpatient weight to mean charges**

DRG number	Surgical DRG description	Inpatient weight	Mean ambulatory surgery charge	Ratio of weight to mean charge (+ 100)
39	Lens procedure	0.57	\$1,534	26.9
364	Dilatation and curettage, conization except for malignancy	0.39	638	16.4
6	Carpal tunnel release	0.41	653	15.9
42	Intraocular procedures except retina, iris, and lens	0.65	1,032	15.9
262	Breast biopsy and local excision for nonmalignancy	0.43	668	15.5
40	Extraocular procedures except orbit, age 65 or over	0.41	573	14.0
38	Primary iris procedures	0.40	276	6.9
157	Anal procedures, over age 69 or with comorbidity	0.73	414	5.7
270	Other skin, subcutaneous tissue, and breast procedures, under age 70, without comorbidity	0.76	307	4.0
269	Other skin, subcutaneous tissue, and breast, operating room procedures, over age 69 or with comorbidity	1.13	276	2.4

NOTE: Weights as published by the Prospective Payment Assessment Commission for 1985 (1986).

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the 1985 hospital outpatient department 5-percent sample file.

**Table 5**  
**Leading 15 medical diagnosis-related groups (DRGs) with ambulatory surgery procedures, by ratio of inpatient weight to mean charges**

DRG number	Medical DRG description	Inpatient weight	Mean ambulatory surgery charge	Ratio of weight to mean charge (+ 100)
47	Other disorders of the eye, age 65 or over, without comorbidity	0.42	\$527	12.5
189	Other digestive system diagnoses, age 65-69, without comorbidity	0.53	506	9.5
348	Benign prostatic hypertrophy, over age 69 or with comorbidity	0.63	429	6.8
325	Kidney and urinary tract signs and symptoms, over age 69 or with comorbidity	0.65	390	6.0
183	Esophagitis, gastroenteritis, and miscellaneous digestive disorders, age 65-69, without comorbidity	0.51	276	5.4
182	Esophagitis, gastroenteritis, and miscellaneous digestive disorders, over age 69 or with comorbidity	0.60	288	4.8
320	Kidney and urinary tract infections, over age 69 or with comorbidity	0.86	409	4.8
318	Kidney and urinary tract neoplasms, over age 69 or with comorbidity	0.92	404	4.4
188	Other digestive system diagnoses, over age 69 or with comorbidity	0.72	307	4.3
331	Other kidney and urinary tract diagnoses, over age 69 or with comorbidity	0.83	345	4.2
283	Minor skin disorders, over age 69 or with comorbidity	0.64	265	4.1
467	Other factors influencing health status	0.72	280	3.9
174	Gastrointestinal hemorrhage, over age 69 or with comorbidity	0.91	287	3.2
172	Digestive malignancy, over age 69 or with comorbidity	1.07	324	3.0
280	Trauma to the skin, subcutaneous tissue, and breast, over age 69 or with comorbidity	0.54	135	2.5

NOTE: Weights as published by the Prospective Payment Assessment Commission for 1985 (1986).

SOURCE: Health Care Financing Administration, Bureau of Data Management and Strategy: Data from the 1985 hospital outpatient department 5-percent sample file.

total billed charges in Table 4, this key ratio varies by a factor of 10. Thus, the idea that outpatient DRGs could be reimbursed using a simple ratio of outpatient to inpatient DRGs is not feasible, and the appealingly simple process of using DRGs as a prospective payment mechanism for hospital-based ambulatory surgery must be rejected.

Very expensive ambulatory procedures (such as cataract surgery) tend to have weights that differ little from much less expensive ambulatory procedures (such as a polypectomy done through a scope). The clinical reason for this is almost certainly that cataract surgery represents a homogeneous set of procedures. Other homogeneous groups of procedures are dilatation and curettage, carpal tunnel release, breast biopsy, and other eye procedures. All of these DRGs have relatively similar ratios of outpatient facility charges to weights. Iris procedures, anal procedures, and skin procedures, however, are clinically heterogeneous, with only the more minor ones being performed on an outpatient basis.

Anal procedures are a case in point. DRG 157 is among the DRGs intended to capture only surgical procedures requiring an inpatient stay. Within this DRG, polyps in the large colon adjacent to the anus were removed on an inpatient basis using an abdominal approach. New technology has made possible the removal of these polyps using a scope procedure; this procedure is now being done on an outpatient basis. Within this DRG, then, local excision of the large bowel (ICD-9-CM procedure code 45.41) is now done inpatient only when actual incisional surgery is involved; when scoping only is involved, the procedure has moved to the OPD. For 1985, the inexpensive scoping procedure, still coded 45.41, accounted for 82 percent of the outpatient procedures done in this DRG.

Under these circumstances, it appears as though the DRGs would require an independent set of weights calculated for ambulatory surgery. Researchers from the Center for Health Policy Studies (CHPS) came to this same conclusion while analyzing surgical DRGs for private patients reimbursed for by Blue Cross of Eastern Pennsylvania (Center for Health Policy Studies, 1987). CHPS researchers found that total hospital reimbursement increased when outpatient surgery was put on a DRG basis in the two experimental hospitals they studied. The mix of DRGs for ambulatory surgery is considerably different for younger, private patients than for the aged Medicare population. Because data on ambulatory surgery in non-Medicare populations were difficult to obtain, Table 6 has been adapted from the unpublished CHPS Blue Cross Study and is included here. The only ambulatory surgery DRGs found in common among the Medicare beneficiaries and the Blue Cross populations under 65 years of age are dilatation and curettage (DRG 364) and carpal tunnel release (DRG 6). This dissimilarity of procedures will have to be considered, of course, in any prospective payment system that, like DRGs, spans both Medicare and other payers.

In order to justify use of a particular system in both inpatient and ambulatory settings, there must be consistent differences in the two settings. Use of the inpatient DRG weights allows comparisons of these differences. Using these weights, both this article and the CHPS study have shown that the ratio of resource use for

**Table 6**  
**Most common outpatient surgical diagnosis-related groups (DRGs) in the Northeastern Pennsylvania Blue Cross population, 1985-86**

DRG number	Description	Number of visits for ambulatory surgery
364	Dilatation and curettage, conization, except for malignancy	172
362	Laparoscopic tubal interruption	160
187	Dental extractions and restorations	159
222	Knee procedures, under age 70, without complications	144
360	Vagina, cervix, and vulva procedures	113
62	Myringotomy, under age 18	92
262	Breast biopsy and local excision for nonmalignancy	91
270	Other skin, subcutaneous tissue, and breast operating room procedures, under age 70, without complications	84
78	Laparoscopy and endoscopy, except tubal interruption	78
225	Foot procedures	73
6	Carpal tunnel release	64
358	Uterus and adnexa procedures for nonmalignancy, except tubal interruption	48
163	Hernia procedures, under age 18	33
159	Hernia procedures, except inguinal and femoral, over age 69 or with complications	29

SOURCE: Center for Health Policy Studies; Data adapted from Table 15, p. 30, of the Blue Cross Study, Columbia, Md., 1986.

particular surgical DRGs is different in the inpatient and outpatient settings. The conclusion is that inpatient DRGs cannot be easily or logically translated for use in ambulatory surgery populations of any age group.

The lack of relationship of resource use in the same DRG when the surgery is performed on an inpatient as opposed to an outpatient basis greatly lessens the appeal of using DRGs to reimburse for ambulatory surgery. This lack of enthusiasm is heightened by the fact that the lack of relationship of resource use has now been demonstrated in both Medicare and younger populations. Another powerful deterrent is the substantial minority of borderline surgical procedures that do not fall into a surgical DRG in the first place.

## Arguments against diagnosis-related groups

There are, of course, significant political and technical arguments against the DRG approach as well. These include:

- In the DRG approach, ICD-9-CM procedure coding is used for the formation of all surgical groups. The Part A hospital outpatient department reimbursement formerly used ICD-9-CM just as inpatient reporting did. Beginning in 1987, however, CPT-4 coding has been mandated for the fiscal intermediaries for all hospital outpatient department care. Moving ambulatory surgical procedures back to the old ICD-9-CM system in order to accommodate DRGs could be seen as a step backward.

- CPT-4 is generally acknowledged by both clinicians and researchers to be a far superior coding system to ICD-9-CM procedure codes, especially for outpatient procedures.
- The freestanding surgery centers have always used CPT-4 for both their facility and physician component reimbursement.
- About one-fifth of all charges for ambulatory surgery are for visits that fall in a medical rather than in a surgical DRG. Except for lens procedures, visits for the most common medical DRGs, as shown in Table 2, were for digestive disorders and skin disorders. These visits were for procedures that were not performed on an inpatient basis as they were 10 years ago when DRGs were first developed. The problem is more pervasive than it might first appear because visits for these procedures tend to be inexpensive and, thus, more numerous. In fact, although only 21 percent of all ambulatory surgery charges fell into a medical DRG, 39 percent of all visits with an ICD-9-CM defined surgical procedure fell into medical DRGs.
- Even if most ambulatory surgical procedures could be accommodated by the DRG system, the DRGs were never designed for nonprocedure-oriented ambulatory care. Thus, DRGs cannot accommodate charges for over 80 percent of all hospital OPD visits.

## Beyond diagnosis-related groups

If there were no readily available alternative, DRGs might still be used as a stopgap measure for a prospective payment system for ambulatory surgery. This is, however, not the case. An outpatient case-mix classification system, ambulatory visit groups (AVGs), has been developed by Yale University and is now in its third generation.

AVGs use CPT-4 coding, cover ambulatory surgical procedures as well as all other ambulatory care, and are designed to be used in any ambulatory setting. Although other case-mix-based systems exist, the AVGs most closely resemble DRGs, and their construction requires the fewest data elements. AVGs are also the most widely tested and are currently being used by the Department of Defense in constructing a prospective budgeting system.

Because a prospective payment system for all hospital OPD ambulatory care will be required in any case by 1991, it appears to make more policy sense to use the same grouping mechanism for all ambulatory care. Ambulatory visit groups represent such a mechanism. The AVG for lens procedures greatly resembles the inpatient DRG for lens procedures. This single AVG captures one-half of all hospital outpatient charges for surgery, as does the cataract DRG. (The cataract AVG has an even better coefficient of variation (.38) than does the cataract DRG. This is because more precise procedure coding is possible using CPT-4.) Like DRGs, other AVGs are much more finely divided; but unlike DRGs, they are much more specific to ambulatory surgery.

The second generation of AVGs currently consists of 570 groups designed by Yale University, which has described them in detail (Schneider et al., 1986; 1988). Four studies were done to validate the AVGs. In one, primary care visits to hospital OPDs (Lion, Malbon, and Bergman, 1987) were analyzed; and in a second,

oncology OPD visits (Lion et al., 1987) were placed into groups. In these two studies, which were based on approximately 10,000 visits to teaching hospital clinics, it was found that the medical AVGs were feasible for grouping disparate visits that did not have a surgical procedure and that the coefficients of variation for total billed charges in these medical AVGs were similar to those of medical DRGs on the inpatient side. When all tests associated with the visit were included, there was approximately a hundredfold difference between the least and most expensive AVGs, compared with about a twentyfold difference for the surgical AVGs.

A third study was based on the entire set of visits to a large health maintenance organization (HMO). Approximately 10 percent of the 38,096 visits involved outpatient surgery. The most common surgical procedures in the HMO population were applying minor casts and splints, minor suturing, excision and drainage of cysts, and minor gynecological surgery such as cauterization of the cervix. Overall, 333 AVGs out of the 570 possible received at least one visit (Hornbrook, Johnson, and Hurtado, 1987). Finally, a survey of approximately 30,000 visits to emergency departments of both community and teaching hospitals in California yielded visits in approximately 180 AVGs (Schneider et al., 1986). The most common ambulatory surgical procedures in terms of volume in this population of all ages were similar to those procedures in the HMO population, especially minor and moderate suturing.

Finally, one study has now been done that is directly relevant to ambulatory surgery in the Medicare population. Using fiscal year 1988 billing data for approximately 250,000 hospital OPD visits that had a CPT-4 code in the surgical range (10,000–69,999), researchers were able to show that the new ambulatory surgery AVGs resemble the DRGs containing ambulatory surgery, as previously discussed, but with very different weights. The most common procedures performed in hospital OPDs in the Medicare population were extracapsular cataract removal with lens insertion, cystourethroscopy, upper gastrointestinal endoscopy, and colonoscopy. Of the 10 most common CPT-4 codes, 3 were cataract surgery and the other 7 involved scoping. Of great importance to the formation of a simplified prospective payment system for ambulatory surgery was the finding that over 80 percent of the dollar volume of all ambulatory surgery was accounted for by only 25 AVGs (Lion et al., 1990).

The AVGs are in the process of being completely revised. This significant revision will be called Ambulatory Patient Groups (APGs) and is being done under contract with HCFA by Health Systems International in New Haven, Connecticut. The APGs differ from AVGs in several areas: There are APGs for all ancillary procedures; there are less than 300 total APGs; and, for APGs related to procedures, CPT-4 codes instead of ICD-9-CM diagnostic codes are used as the primary axis of classification. Perhaps most importantly, the AVGs were designed to explain the variation in physician time for a visit, while the APGs consider total resource use in hospital outpatient department settings.

Meanwhile, the Department of Defense (DOD), through the Office of the Assistant Secretary of Defense for Health Affairs, is using a modified 385-group version

of the AVGs. In order to develop weights for the DOD, Medicare data were run through all AVGs, both medical and surgical. Approximately, a two hundredfold difference between high and low weights was demonstrated. Preliminary analysis of the DOD data reveals that very little surgery, even of a minor nature, is performed on an outpatient basis.

## Conclusions

In summary, ambulatory visit groups (AVGs) or ambulatory patient groups (APGs) appear to be a feasible mechanism for use for a prospective payment system. AVGs were designed for this purpose, and their performance is superior to that of DRGs in this area. APGs are expected to perform even better in an arena such as the Medicare population, where much of hospital OPD billing consists of referred tests. Another powerful incentive for using AVGs or APGs as a reimbursement vehicle has already been mentioned. This is that ambulatory surgery centers are congressionally mandated to be reimbursed under the same prospective payment system as hospital-based clinics, using a blended rate for the facilities component of each. This is much simpler to do using AVGs or APGs; the surgery centers are unfamiliar with ICD-9-CM and have always used CPT-4 coding. Using DRGs could thus present substantial implementation problems for these centers.

The cost of outpatient care continues to be a serious problem for HCFA and other third-party payers. For example, Glen Kramon (1988) reported that hospital-based outpatient care "... still lacks the kinds of controls on the cost and appropriateness of procedures that the government and private insurers established for hospitals in the early 1980s." Based on these considerations, AVGs or APGs may well be an ideal mechanism for a case-mix-based prospective payment system for all hospital OPD visits.

## Acknowledgments

We would like to thank Thomas Talbott, Mark Wynn, and Michael Hupfer of the Health Care Financing Administration for their support. Diane Rogler, formerly of the Health Care Financing Administration and now Vice President for Administration at Annapolis General Hospital, Annapolis, Maryland, was extremely helpful with her comments on an earlier version of this article.

## References

- Bowen, O.R.: Development of Prospective Payment Methodology for Outpatient Hospital Surgical Services: Interim Report to Congress, Washington, D.C. Department of Health and Human Services, Jan. 1988.
- Boyle, J.F.: Don't feud over the RVS. *Internist* XXIX(1):40-41, Jan. 1988.
- Brandeis University: Unpublished data. Waltham, Mass., 1990.

Center for Health Policy Studies: Evaluation of the Impact of Prospective Payment Alternatives Implemented by Blue Cross of Northeastern Pennsylvania: Final Report. Columbia, Md. Center for Health Policy Studies, Jan. 1, 1987.

Fisher, C.: Impact of the prospective payment system on physician charges under Medicare. *Health Care Financing Review*. Vol. 8, No. 4. HCFA Pub. No. 03239. Office of Research and Demonstrations. Health Care Financing Administration. Washington. U.S. Government Printing Office, Summer 1987.

Hsaio, W.C., Braun, P., Yntema, D., and Becker, E.R.: Estimating physicians' work for a resource-based relative-value scale. *New England Journal of Medicine* 319(3):835-841, Sept. 29, 1988.

Hornbrook, M.C., Johnson, R.E., and Hurtado, A.: *Validation of Ambulatory Visit Groups on an HMO Database*. Unpublished final report. Portland, Ore. Kaiser Permanente, Nov. 1987.

Kramon, G.: Outpatient strategy fails to cut health costs. *The New York Times*. Mar. 8, 1988.

Lion, J., Henderson, M., Bergman, A., and Malbon, A.: Ambulatory visit groups: How they perform for oncology outpatient departments. *Journal of Cancer Program Management* 2(2):22-23, Spring 1987.

Lion, J., Malbon, A., and Bergman, A.: Ambulatory visit groups: Implications for hospital outpatient departments. *Journal of Ambulatory Care Management* 10(1):56-69, Feb. 1987.

Lion, J., Vertrees, J., Malbon, A., et al.: The case mix of ambulatory surgery as measured by ambulatory visit groups. *Journal of Ambulatory Care Management Special Issue of Ambulatory Surgery*. 13(1):33-46, Feb. 1990.

Prospective Payment Assessment Commission: Report and Recommendations to the Secretary, U.S. Department of Health and Human Services. Washington. U.S. Government Printing Office, Apr. 1986.

Public Health Service and Health Care Financing Administration: *International Classification of Diseases, 9th Revision, Clinical Modification*. 2nd ed. DHHS Pub. No. (PHS) 80-1260. Public Health Service. Washington. U.S. Government Printing Office, Sept. 1980.

Roos, N., and Freeman, J.: Evaluating the potential for inpatient-outpatient substitution with diagnosis-related groups. *Health Care Financing Review*. Vol. 10, No. 4. HCFA Pub. No. 03284. Office of Research and Demonstrations, Health Care Financing Administration. Washington. U.S. Government Printing Office, Summer 1989.

Schramm, C., and Gabel, J.: Prospective payment: Some retrospective observations. *New England Journal of Medicine* 318(25):1681-1683, June 23, 1988.

Schneider, K.C., Lichtenstein, J., Freeman, J., et al.: Ambulatory visit groups: An outpatient classification system. *Journal of Ambulatory Care Management* 11(3):1-12, Aug. 1988.

Schneider, K.C., Lichtenstein, J., Fetter, R., et al.: *The New ICD-9-CM Ambulatory Visit Groups Classification Scheme: Definitions Manual*. New Haven, Conn. Yale University, School of Organization and Management, 1986.