

**Final Staff Recommendation on The Ambulatory Surgery Guaranteed
Revenue System**

Health Services Cost Review Commission
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The purpose of this paper is to propose methodological changes and a plan to implement the HSCRC's Prospective Ambulatory Surgery Guaranteed Revenue Payment System. This document is a final recommendation and is ready for Commission action.

Introduction

Ambulatory surgery revenue has been increasing much substantially faster than the allowed outpatient rate increases. The Commission wishes to constrain this rate of increase by establishing limits on the rate of increase in the revenue per case-mix adjusted ambulatory surgery case for each hospital, and to provide better incentives to control utilization. The guarantee/limit will be established using a base year, FY 2007, and will be used to set the allowable revenue for an ambulatory surgery case with a weight of one (1) for FY 2008 and subsequent years. The limit will be adjusted for outpatient rate increases, and an intensity allowance to allow for changes in technology and within APG increases in case-mix intensity. The rest of this paper describes the proposed system in more detail.

The ambulatory surgery revenue per case has been increasing much faster than the outpatient update factor. From CY 2005 to CY 2006 ambulatory surgery revenue rose by 12.2%. Decomposing this into its components, the number of cases rose by 3.3% and the revenue per case rose by 8.7%. The case mix, measured using APGs, dropped by 0.3%. The revenue per ambulatory surgery case has consistently been increasing substantially faster than the outpatient update factor over the last several years. CareFirst provided data showing that between 2004 and 2005 their outpatient payments, and payments per patient, increased much more in Maryland than they did in DC and Virginia.

The next section of this paper provides a simple description of how the guaranteed revenue system would work, and provides a simple example. The subsequent sections provide a detailed description of the methodology.

Overview and example

1. Establish a base year. If FY 2008 is the first year to which the guaranteed revenue would apply, then the base year would be FY 2007.
2. Calculate the ambulatory surgery case mix index (CMI) and charge per case mix adjusted case for the hospital in the base year.
3. Adjust for the impact of rate changes between the years and for the intensity allowance. The result is the approved charge for the hospital for the rate year for an ambulatory surgery case with a weight of 1.0.
4. After the end of the rate year calculate the actual charge per case with a weight of 1.0. Compare this with the approved charge from step 3. If the actual is higher than the approved charge then the excess is subtracted from the approved revenue for the subsequent year, and if the actual is less than the approved charge the difference is added to the approved revenue for the subsequent year.

Example:

Base year charge per case	\$2,200
Base year case mix index	1.1
Base year charge per case with weight of 1.0	\$2,000
Ambulatory surgery rate increase	5%
Intensity allowance	1.0%
Approved rate	\$2,120

Scenario 1:

Actual revenue per case	\$2,250
Actual rate year case mix index	1.11
Actual revenue per case with weight of 1.0	\$2,027

Since the actual case mix adjusted revenue is less than the approved revenue, the difference will be added to the approved revenue for the subsequent year.

Scenario 2:

Actual revenue per case	\$2,300
Actual rate year case mix index	1.06
Actual revenue per case with weight of 1.0	\$2,170

The actual rate exceeds the approved rate by \$50, so the excess revenue will be subtracted from the approved revenue for the subsequent year.

The adjustment for Scenario 2 is calculated as follows:

Actual revenue per case with weight of 1.0	\$2,170
Approved revenue per case with weight of 1.0	\$2,120
Excess per case with weight of 1.0	\$50
Number of cases	5,000
Case mix index in rate year	1.06
Excess revenue $1.06 \times 5,000 \times \$50 =$	\$265,000

So \$265,000 will be subtracted from the approved revenue for the hospital for the subsequent year.

Discussion of some of the major components of the system

Case weights using the principal APG:

Case weights are being developed using just the principal APG, which has been assigned using Maryland weights. Earlier modeling developed case weights using the weight for the principal APG, and discounted weights for second and subsequent significant procedures. It was found that the use of the principal APG only to assign case weights resulted in little loss of explanatory power, greatly simplified the system, and will make it much easier for hospitals to monitor their performance.

Magnitude of the intensity allowance:

How much of an allowance should be provided for changes in medical technology and for changes in case mix that are not accounted for by the APGs? When the inpatient GIR was first implemented a 1% allowance was provided for technology/intensity. When the GIR was adopted the amount that charge per discharge was increasing in excess of input price inflation was about the same as the excess currently being observed for ambulatory surgery charge per case. The staff is recommending an intensity allowance of 1%.

Multiple visits within a record:

Some records include charges and information for multiple visits to the hospital, not just for a single ambulatory surgery visit. Most of these have been eliminated as a result of the elimination of cases involving chemotherapy, radiation therapy, or medical visits. However, some such cases remain in the data, probably primarily for return visits for wound care. In the future the records for such cases should be separated into multiple records, separating the charges for the different visits. A technical committee should be set up to advise on how that separation should be done.

PET scans:

Currently PET scans are grouped with CAT scans, and no allowance is made for them in the methodology. This should not cause problems as long as the proportion of PET scans remains relatively constant within the hospitals. The new APG grouper will have a separate APG for PET scans.

Missing data:

There is evidence that some hospitals are missing substantial numbers of cases that should have been reported as ambulatory surgery, for example, breast biopsies and other cases involving radiological guidance. The staff pointed this problem out to hospitals in a letter several months ago, and delayed data submission to allow for corrections. It is anticipated that the data submissions under the new regulations will not have this problem. This issue is one of the reasons that FY 2007 is being recommended as the base year.

Use of the new grouper:

The current APG grouper is about 12 years old, and there has been considerable change in the interim in the scope and nature of ambulatory surgery. 3M is working on a new version of the grouper – APG3. The CY 2005 and 2006 ambulatory surgery data have been supplied to 3M and it is anticipated that the data with APGs grouped under APG3 will be provided by 3M in June. Staff will review the data in depth and repeat much of the modeling that has been done once the new groups are received. The adoption of a new grouper is in keeping with the policy on APR-DRGs under which the Commission automatically adopts the new version of the grouper once it becomes available.

Statewide versus hospital specific weights:

The staff methodology uses weights for the APGs that are developed using the data for all the hospitals. It has been suggested that hospital specific weights should be used, to account for differences in reporting and in the types of cases being grouped to particular APGs by different hospitals. The staff considered this suggestion, but is still recommending the use of statewide weights for two main reasons: 1) use of hospital specific weights would provide incentives for hospitals to concentrate on the types of cases they do least efficiently, and not on the types of cases they do most efficiently, and 2) cell sizes would be very small for many hospital/APG combinations if hospital specific weights are used, resulting in erratic case mix weights. However, this is an area in which good arguments can be made for either option, at least for initial implementation of the system

Base year:

The base year could be the year immediately preceding the rate year, or the year prior to that. That is, with a rate year of FY 2008, the base year could be FY 2007 or FY 2006. The staff considered recommending the use of FY 2006 as this would allow for modeling with currently available data. However, staff is recommending use of FY 2007 as the data are more complete, and there would be fewer coding changes and less change in medical practice between the base year and the rate year.

Corridors on rewards and penalties:

Staff are receptive to the idea of restricting rewards and penalties within some corridor. The corridor, if adopted, would be established once the modeling has been completed with the new grouper, and the level of variability has been studied.

Staff recommendation:

The Commission should implement a guaranteed revenue system for ambulatory surgery for FY 2008, using FY 2007 as the base year, using the methodology outlined in this paper.

Detailed description of the methodology

Adjustments to the data

No adjustments were made for labor market and direct or indirect medical education costs. Since the GOR is specific to each hospital, the labor market differences experienced by a hospital are expected to be minor, as are changes in the level of medical education. For this reason no adjustments for labor market or medical education are required. The adjustment for the change in ambulatory surgery rates automatically accounts for changes in the mark-up of the hospital, rate realignment, and updates.

APG updating, consolidation and bundling of APGs

The current APG grouper is now over 12 years old, and medical practice has changed substantially in that time. A new grouper has been developed by 3M. Data grouped under this new version are expected in June, and commercial software will be available in October.

The modeling to date has been done using the current version of the APGs, (APG2), but with some modifications. The APGs for pacemaker implant and revision appeared to be particular problems, and these APGs often include high supply charges. The most significant problem is the inclusion of procedures involving Automatic Implantable Cardio-defibrillators (AICD) in APGs that generally include much less expensive procedures. To deal with this problem a separate APG was defined to include AICD cases. The new APG grouper will take care of most or all of the problems that required new groups or remapping of codes. Much of the modeling that has been done will be repeated once the new groups are available to confirm it performs as expected. However, the staff considered that the old grouper was adequate to proceed with implementation of the GOR, and the new grouper is expected to result in further improvement of the results.

Each case may have up to 100 APGs assigned to it, but many of these APGs are for ancillary procedures, or for procedures that are an intrinsic part of the main procedure performed. APG weights were developed for the purpose of assigning the principal APG in each case. A description of the method used to calculate these weights is attached as Appendix A. The principal APG was defined to be the significant procedure APG with the highest weight.

In the research leading up to this recommendation two different approaches were taken to the assignment of weights to the cases:

- 1) Ancillary procedures were eliminated, and procedures were consolidated using the 3M APG consolidation rules, and multiple occurrences of any given APG were consolidated into a single occurrence. The case was assigned a weight that included the weight for the principal APG and discounted weights for second and subsequent significant procedure APGs.
- 2) A principal APG was assigned and the weight for the case was the weight for that APG.

It was found that there were only minor differences in the explanatory power of these two models, and the differences in the outcomes were relatively minor. As a result we are recommending the use of the simpler second model. This should enable hospitals to monitor their performance much more easily.

Calculation of case-mix weights

Case-mix weights were calculated using an iterative process that takes account of the relative charge levels of the hospitals. This step differs from the development of case mix weights described in Appendix A, and used for the assignment of the principal APG in that additional cases were dropped from the analysis. The exclusions for this step are described in the next paragraph.

Cases with an adjusted charge of under \$10 were dropped on the rationale that they were probably data errors, as were any cases that included an APG for chemotherapy or chemotherapy drugs, or radiation therapy, or that included APG 993 (inpatient procedure) or cochlear implants. Any case that included an emergency room charge, or that was classified as a delivery, was dropped. Cases with a valid medical APG assigned were also dropped, on the assumption that these must include other than just ambulatory surgery visits. Cases at the Hopkins oncology center were dropped. Cases from the University of Maryland Shock Trauma and Cancer centers will be dropped once they are identified in the data, but it is anticipated that very few such cases remain in the data after the editing and exclusions described.

First iteration

Calculate the average charge by principal APG: call this the expected charge.

Calculate each hospital's mean charge and the mean expected charge for the cases treated by the hospital, just using the principal APG code.

Calculate a hospital specific adjustment factor, which is the mean charge divided by the mean expected charge.

Adjust the charge by dividing it by this adjustment factor.

Recalculate the mean expected charge for each APG and the hospital adjustment factor. Adjust the adjusted charges again using the hospital adjustment factor.

Repeat once more, recalculating the mean expected charge for each APG. These mean expected charges (MEC) are the basis for the APG case-mix weights.

The FY2007 data will be used for the calculation of the weights. In practice, the base year data, the year prior to the rate year, would be used to calculate the case-mix weights.

Alternatives considered:

The weights could have been calculated using adjusted charges, and without the iteration to eliminate the impact of different hospital charge levels. The reasons for using hospital specific relative value weights (also know as iterative weights) have been discussed extensively in the context of the inpatient DRG weights and will not be repeated here.

Separate weights could have been calculated for each hospital using the hospital's own data. This method reduces the cell sizes and so results in less reliable weights. It also provides incentives for hospitals to try to increase the volume of cases in APGs that they were performing inefficiently in the base period, and to reduce the volume of cases in APGs in which they were efficient in the base period. For these reasons we have tentatively decided to continue to use statewide weights.

Calculation of hospital case-mix indices

Using FY2007 data, the expected charge for the case is the MEC for the principal APG in the case.

Calculate the weight for each APG as the MEC for the APG divided by the mean MEC over all cases.

Calculate the case-mix weight for the case as the weight for the principal APG in the case. The mean case-mix index over the state is then 1.0 for FY 2007.

Use these weights to assign a case-mix weight to each case in FY2008.

Calculate the mean adjusted charge and mean case-mix index for each hospital for each of FY2007 and FY2008.

Calculate the statewide standardized charge for FY2007 and FY2008 as the mean adjusted charge divided by the mean case-mix index for the year.

Alternatives considered:

The weight for each case will be based on the principal APG assigned to the case. An alternative would have been to assign the full weight for the principal APG and a discounted weight for second and subsequent significant procedure APGs. The advantages of using just the principal APG to assign the weight to the case are:

- 1) the monitoring of the system by the hospitals will be greatly simplified if the case mix weight is based on a single APG and that APG is identified by the HSCRC data processing contractor.
- 2) The potential for case mix creep due to reporting more secondary procedures will be reduced or eliminated.

This latter is an important benefit, as we do not know the extent to which secondary procedures could be added, but suspect there are still issues with the completeness of the reporting of procedures. The disadvantage of using only the principal APG is that the

hospitals have less of an incentive to improve the completeness of the coding of secondary procedures. We believe the advantages of using just the principal APG substantially outweigh the disadvantages.

Outpatient price leveling factor

The charges per case-mix adjusted case increase over time due to approved rate increases, rate realignment, and increases in utilization of services within APGs. The approved charge per case should be adjusted for the increase in the ambulatory surgery rates between the base year and the rate year. This will be done using charges split into 31 charge buckets. The definition of the charge buckets has been extensively reviewed in the process of developing this system.

Classify the charges for ambulatory surgery cases into 31 charge buckets, then use the revenues in these charge buckets to calculate a weighted average rate increase, using the rate increases approved by revenue center. Some charge buckets involve charges from several revenue centers. For these charge buckets the rate increase will be a weighted average of the relevant rate increases in the revenue centers mapping to the charge bucket.

Since major shifts in rates are expected as a result of rate realignment between FY 2007 and FY 2008, the ambulatory surgery rate change will be calculated using revenues at the 31 charge bucket level, and weights for the charge buckets that are hospital-specific.

Utilization Increase and intensity allowance

When the Guaranteed Inpatient Revenue System (GIR) was first designed the Commission provided an allowance of 1% over factor cost inflation to allow for changes in technology and within DRG case mix intensity increases. What level of intensity increase should be provided under the GOR system? We are recommending a 1% intensity allowance. It should be noted that the system will automatically adjust for changes in case mix as measured by the APGs, so this intensity allowance is just to account for technology changes and within APG intensity changes.

Revenue constraint or Guaranteed Revenue

The methodology described above could be used to develop a guaranteed revenue per case mix adjusted ambulatory surgery case (GOR), or to place an upper bound or constraint on the revenue per case mix adjusted ambulatory surgery case (CAR). The difference is that in a GOR system a hospital's rates would be increased in a subsequent year if it did not achieve its GOR in a year, whereas in the CAR system there would be no adjustment if the actual revenue was under the allowed revenue, but there would be an adjustment to a subsequent year's revenue if the actual revenue exceeded the allowed revenue.

The risk with a GOR is that the hospitals could upcode and receive additional revenue as a result of APG case mix creep. At this point we do not know the potential for such upcoding but consider that it is relatively minor given the structure of the APGs, and that only the principal APG is being used to assign the weight to the case. Moreover, under a

CAR system, if a hospital has a sophisticated revenue monitoring system it could upcode in ambulatory surgery and adjust its rates between inpatient and outpatient services to hit the ambulatory surgery revenue limit, reducing its inpatient charges, and gaining additional revenue through the inpatient CPC.

The options available include:

1. Setting a guaranteed revenue for ambulatory surgery cases, and making adjustments in subsequent years' revenue for deviations, both up and down, from the case mix adjusted approved revenue.
2. Setting an upper limit on the revenue per ambulatory surgery case and adjusting the subsequent years' revenue if this is exceeded.
3. Setting a target revenue per case mix adjusted ambulatory surgery case and monitoring performance relative to that amount. Requiring hospitals to explain any substantial deviations from the approved target.

The staff is recommending option 1.

Exclusions:

Cochlear implants will be excluded as they are concentrated in a few hospitals and are very expensive, largely due to the cost of the implant.

Cases with a principal procedure that is a simple procedure often performed in a clinic setting will be dropped from the GOR for year 1. This issue will be revisited for subsequent years.

For FY 2008 cases in which the From and Thru dates are more than 3 days apart will be dropped from the analysis as they may involve multiple encounters. In subsequent years these cases may be split into individual encounters.

Cases that include oncology or radiation treatments will be dropped from the analysis, as they may be cycle bills involving multiple encounters.

Cases with a charge of less than \$10 will be dropped.

Corridor on gains and losses:

Since this proposal is groundbreaking it has been suggested that the gains and losses should be limited within some corridor. The staff is amenable to this suggestion. Once the data are received with the APGs assigned using the new grouper and analysis will be performed to assess the magnitude of the variations from year to year in case mix adjusted and price-leveled charge per case. Based on the results of that modeling the Staff will return to the Commission with a recommendation whether corridors are desirable, and, if they are, the recommended width of the corridor.

Appendix A

Development of APG Weights for Assignment of Principal APG

The principal APG will be assigned based on weights developed from the Maryland APG data. The purpose of this appendix is to describe the method used to develop the weights to be used to assign the principal APG, the adjustments to be made in developing these weights, and the rationale for these adjustments.

The weights will be developed with the ambulatory surgery data for the year ending June 30, 2007 (FY 2007).

It should be noted that the purpose of these weights is for the assignment of the principal APG. They are not intended for other use. Once the principal APG has been assigned new weights will be calculated for the GOR with different exclusions.

The following adjustments and exclusions will be made:

Drop cases with an adjusted charge of under \$10. Once the data are received with the new APGs, the outliers thresholds for the development of weights will be revisited.

Drop cases if the nature of the surgery was emergency, or if there was an emergency room charge.

Drop cases with a hospital ID of 54, 71 or 72. (Only 54 occurs in the data at present)

Drop APGs 51, 57, 253, 254, 255 and all APGs higher than 270 except 993 (APG numbers under APG2 – these will be revised once the APG3 listing is received).

Consolidate APGs using the 3M consolidation rules, and drop multiple occurrences of APGs.

Calculate weights, with 3 iterations to adjust for differences in the hospital case mix adjusted charge levels. This produces HSRV weights. The rationale for using HSRV weights is as for the inpatient case mix weights. Case mix weight for each APG will be calculated by dividing the mean adjusted charge for the APG by the mean charge for all included cases.

The principal APG for a case will be the highest weighted significant procedure APG in the case.