

**ASSESSMENT OF
BLUE CROSS BLUE SHIELD OF DELAWARE'S (BCBSD) METHODOLOGY
TO DETERMINE THE COSTS AND COST RANKINGS OF TWO SERVICES:
OUTPATIENT SURGERY AND OUTPATIENT RADIOLOGY**

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1. OVERVIEW OF PRESENT REPORT

In 2010, Blue Cross Blue Shield of Delaware (BCBSD) conducted an evaluation of outpatient surgery and outpatient radiology services provided at geographically different sites within the selected Delaware counties. Hereinafter, that BCBSD evaluation will be referred to as “the BCBSD cost study”. The purpose of the BCBSD cost study was to estimate the separate costs of each outpatient services at the different settings and then rank the alternate sites by their costs. Following their cost study, BCBSD signed a contract with the Center for Community Research and Service (UD), at the University of Delaware to engage Paul Solano, Ph.D. to assess the soundness of the BCBCD methodology for determining the separate costs of the two services and the subsequent ranking of the sites according to the determined costs. The present appraisal does not entail cost determination but rather an evaluation of the methodology that BCBSD employed to derive their own cost estimates and cost rankings.

2. DIMENSIONS OF THE ASSESSMENT

The assessment of the methodology employed by BCBSD (and as listed in the order specified by the contract) was and did include consideration of the appropriateness of:

1. Data generation from twelve consecutive months of utilization, based on dates of service, with three months of utilization data after the 12 months.
2. The range of the CPT codes for selection of surgical and radiology services.
3. The comparability of CPT codes utilized for data selection among alternate sites and the outpatient and radiology settings.

4. Separation of analysis and data summary (of costs) at the county level, by facility, and by code levels, to conduct regional analysis.
5. Comparison of average amount of allowables at different sites.
6. The rankings criterion, inclusive of breaking points of the scale, to determine the appropriate order and categories of cost levels.
7. The utilization of data of professional (physicians and other certified health personnel) claims three days prior and three days after the services were rendered as a basis of cost determination.
8. The general determination that professional claims added to hospital outpatient/ASC service claims of one day results in an episode of care inclusive of all reasonable costs associated with surgeries.
9. The rejection of not allocating claims with multiple lines for various categories of services (lab, etc) to specific surgeries.
10. Inclusion of Ambulatory Surgery Centers (ASC), with low utilization, in the surgery analysis.
11. For radiology, adding the professional component from free standing facilities to the technical component of hospitals to obtain global to global fee comparison.

3. DATA AND INFORMATION SUPPLIED BY BCBSO

Because of confidentiality and legal issues, BCBSO did not send the BCSD cost study report. Rather, BCBSO provided the data that BCBSO used to conduct their cost analysis of the two services. The data was provided to facilitate consideration of the assessment requirements pertaining to the BCBSO methodology. Two separate EXCEL files were supplied; -- one file for

outpatient radiology services and one file for outpatient surgery services. Separate codebooks were also given for each file. Each codebook was included as an individual sheet within the EXCEL file. The codebooks described, labeled, and defined the variables included in the data sets as well as presented an example that demonstrated the bases of BCBSD own cost calculations. In each file, the data was randomly selected and representative of various outpatient radiology and outpatient surgery providers that were included in the BCBSD cost study. Both data sets were comprised of observations of providers located throughout the State of Delaware, with the providers designated by their locations in the three Delaware counties, with multiple observations drawn for providers for which each observation indicated a separate claim. The observations did not contain identifiers of any providers, individuals, patients, or facilities. The data did not allow deductive identification of any specific provider.

The variables included in the outpatient radiology data set are presented in Table 1. The variables included in the outpatient surgery data set are given in Table 2.

Table 1: OUTPATIENT RADIOLOGY SERVICES

A. PROVIDER TYPE	Hospital or radiologist
B. COUNTY	County location of the provider's site
C. PROVIDER	Masked identification (id) of a provider
D. CPT CATEGORY	CPT (Current Procedural Terminology) codes are numbers assigned to every activity and service a medical practitioner provided to a patient which could be medical, surgical and diagnostic services. CPT codes are used by insurers to determine the amount of reimbursement that they will pay to a practitioner.
E. HOSPITAL UNITS	The number of service units for which a hospital bills for the technical component of its rendered service/activity.
F. HOSPITAL ALLOWED	Allowed amount in dollars for A hospital's bill for the units of (the technical components for) service/activity.
G. HOSP \$ / UNIT	Average allowed amount in dollars per unit (or unit cost) of service/activity provided by a hospital. $G = (F/E)$.
H. PROFESSIONAL UNITS	Quantity of service units, defined as professional units, billed by a radiologist for service/ activity provided in a hospital.
I. PROFESSIONAL ALLOWED	Allowed amount in dollars for the quantity of service units, defined as professional units, billed by a radiologist provided in a hospital.
J. PROFESSIONAL \$ / UNIT	Average allowed amount in dollars per unit (of service/activity) provided by a radiologist in a hospital.
K. RADIOLOGIST UNITS	Quantity of service units billed by a radiologist for service/activity provided in a <u>non</u> -hospital setting. This measure is the Global units billed by a radiologist.
L. RADIOLOGIST ALLOWED	Allowed amount in dollars for the quantity of service units billed by a radiologist provided in a <u>non</u> -hospital setting. This measure is the Global allowed amount billed by a radiologist.
M. GLOBAL	Global measures the total allowed amount per unit of service of a provider's claims. Global could represent one of two types of service delivery. First, it can represent the hospital technical allowed amount per unit, HOSP \$ / UNIT (G) plus the professional amount per unit, PROFESSIONAL \$ / UNIT (J) , i.e., the combined allowed amounts per unit of both the hospital and the radiologist (professional) who rendered the service <u>within</u> the hospital. Alternatively, it can represent the allowed amount in dollars per unit of service for the quantity of service units billed by a particular radiologist provided in a <u>non</u> -hospital setting (I).

Table 2: OUTPATIENT SURGERY SERVICES

A. COUNTY	County location of the provider site
B. CPT	CPT (Current Procedural Terminology) codes are numbers assigned to every activity and service a medical practitioner provided to a patient which could be medical, surgical and diagnostic services. CPT codes are used by insurers to determine the amount of reimbursement that they will pay to a practitioner.
C. FACILITY ID	Masked identification (id) of a provider.
D. UNIT COST	The calculated average (unit) cost for the provider for rendering a service/activity specified by a CPT code.
E. CLAIM DATE OF SVC	Date of service for each claim, for information purposes only as an indicator of separate claim.
F. FACILITY AMOUNT	Allowed amount in dollars for each claim by a facility.
G. RELATED AMOUNT	Related <u>non</u> -facility costs, if any, associated with facility claims. These amounts include bills from other providers such as anesthesia, surgeon etc. that occurred three (3) days prior or three (3) days after the facility claim.
H. TOTAL AMOUNT	Total amount in dollars is the sum of the facility amount and the related amount.
I. AVERAGE	The average is the total amount in dollars divided by the claim count of a facility. The average is the unit cost (D above). It is derived by summing the separate values of each claim submitted by a provider for services with the <u>same</u> CPT code over the time frame of the study.

4. THE METHODOLOGY OF THE BCBSD COST STUDY

Before the individual assessment dimensions stated above are discussed, the BCBSD cost methodology of each of the two outpatient services is reviewed. A caveat is that the nomenclature of cost refers to the financial amounts in the form of BCBSD allowed or paid payment to providers, or the payment billed to the BCBSD and received payment by providers. The cost methodologies applied to the two services differ slightly because of the obvious substantive nature differences in their service delivery and medical purpose. Consequently, each service will be described in separate sections. The bolded words refer to definitions in Tables 1 and 2. CPT codes refer to the codes found in *Current Procedural Terminology CPT 2011, Standard Edition* that was published in 2010 by the American Medical Association (AMA). The AMA views the CPT codes as guidelines that describe the procedures and services that physicians and other medical care providers perform and each of the five digit codes signifies and defines a particular service or procedure.

A. OUTPATIENT RADIOLOGY SERVICES

i. Cost Derived From Billing And Allowed Amounts

Outpatient radiology services were provided to patients/clients in two alternate settings throughout the State of Delaware for the cost determination period of 15 months.

(1) Hospital settings: Outpatient radiology services are delivered in various hospitals. In this situation, two sources of billing are involved for determining the cost of service claims.

- a. Hospitals billed BCBSD for a number of service units that comprised only the technical component of the radiology service (e.g., equipment, operations, overhead, hospital personnel) i.e., the **hospital units**.

- b. BCBSD paid an aggregate allowed amount (**hospital allowed**) for all the hospital units of the hospital provider.
- c. An average (or unit) cost (the **hosp \$/unit**) for the technical component of radiology services was calculated by the division of the provider's total **hospital allowed** amounts by the total number of **hospital units** delivered by the provider.
- d. In addition, for the same service claims, BCBSD was billed for all the units of services conducted by a radiologist (s) within the hospital, i.e., the **professional units**.
- e. BCBSD paid an allowed amount (**professional allowed**) for the all the professional units that were provided at the particular hospital.
- f. An average (or unit) cost (the **professional \$/unit**) was calculated by the division of the radiologists' total **professional allowed** amounts by the total number of **hospital units** delivered by the provider.
- g. The average professional service costs (**professional \$/unit**) and the average hospital service costs (**hosp \$/unit**) of a particular facility were added to derive an average (unit) cost, referred to as **Global** cost of a hospital provider. The **Global** cost is merely an average cost of radiology services of the all BCBSD allowable amounts that are at a particular hospital for radiology services inclusive of both technical and professional services. That is, **Global** unit cost equals **hosp \$/unit** plus **professional \$/unit**.

(2) Non-hospital setting: The second (and alternate) delivery mechanism of radiology services occurred in non-hospital settings. These settings were stand alone radiology facilities (radiology units).

- a. The “independent” radiology entity billed BCBSD for a total number of service units (**radiologist units**) encompassed by the evaluation period.
- b. BCBSD paid the radiological entity an allowed amount in dollars for the total billed service units during the evaluation period (**radiologist allowed**).
- c. A **Global** allowed amount was then determined. It is the total allowed amount by BCBSD for all service units provided by a radiologist (**radiologist allowed**) of a facility divided by the number of service units that were delivered (**radiologist units**). That is the Global amount is the average or unit cost of service units provided by a particular radiologist facility.

ii. **Cost Determination**

- (1) The billed and allowed amounts for the two alternate service deliveries – hospital and non-hospital settings ---were paid according to the Current Procedural Terminology (CPT) codes (See Tables 1 and 2).
- (2) The allowed payments were applied to the separate CPT codes encompassing MRI (magnetic resonance angiography) scans, MRA (magnetic resonance imaging) scans, CT (computer tomography) scans, and “OTHER” radiology services.
- (3) The **GLOBAL** allowed amounts then were arranged according to three factors: county, CPT code, and provider.
- (4) The providers were assigned to one of the three State of Delaware counties (New Castel, Kent, Sussex) where their practice/facility was located.
- (5) Then, each practice/facility in the separate counties was subdivided according to the specific CPT defined services. More specifically, the **Global** allowed amounts of

providers were grouped according to the same CPT codes, e.g., segmented into separate groupings, for say MRI scans and also for CT scans.

- (6) Thereafter, for each county the grouped **Global** allowed amounts for the same CPT codes were arranged from the lowest to the highest values (unit costs) for all providers.
- (7) These separate rankings of Global allowed amounts were then divided into five point ranking scale that BCBSD calls the “Zagot” ratings. The Zagot rating is merely a scale comprised of categories from one to five with five signifying the most costly. That is, the costs of a CPT defined service assigned a higher ranking number falls into a category of costs estimates which is greater than the service costs assigned to categories with lower numbers.

B. OUTPATIENT SURGERY SERVICES

The cost determination of outpatient surgery services was based on providers’ claims that encompassed a 15 month period.

- Providers’ claims were assigned to the county where the practices/facilities were located.
- All of a particular provider’s claims for the 15 month period were organized by the same CPT code.
- All provider claims comprised at least a least a facility claim for which BCBSD paid an allowed amount in dollars (**Facility Amount**) according to the a CPT code.
- Most claims also entailed a **related amount** allowed by BCBSD according to a CPT code.
- The **related amount** was any non-facility costs associated with a facility claim for service specified for a particular CPT code.

- The **related amounts** included billings from other providers such as anesthesia, surgeon etc. that occurred three (3) days prior or three (3) days after and associated with a facility claim.
- The addition of **facility amount** and **related amount** yielded a **Total Amount** in dollars paid for a specific set of claims identified by a particular CPT code.
- An **Average**, or unit, cost was then calculated by dividing the **Total Amount** allowed a provider for a specific CPT code by the number of claims submitted by the provider for the services identified by the particular CPRT code. That is, the **average amount** is merely unit costs for a service recognized by a specific CRT code.
- Thereafter, all the **Average Amounts** of all providers within a county were grouped separately according to the individual CPT codes.
- These separate groups of each CPT code were arranged from the lowest to the highest values (unit costs) for all providers.
- These separate rankings of **Average allowed amounts** of all providers were then divided into five point ranking scale that BCBSD calls the “Zagot” ratings. The Zagot ratings are merely a scale comprised of categories from one to five with five being the most costly.

5. EVALUATION

The cost determination methodologies of the two services above-described are evaluated by addressing the eleven assessment dimensions listed above. Most of these dimensions apply to both services. Consequently the two services are discussed in tandem. Because many of the assessment dimensions are interrelated in their concepts, there is redundancy in some of the evaluation responses of the separate dimensions.

The appraisal leads to the overall conclusion that the cost determination methodologies for each service are sound. With very minor reservations the methodologies are appropriate and cogent for rendering clear cut decisions about the separate cost estimates and rankings of the two outpatient services. The methodologies yield very accurate bases for evaluating the cost of the same service to patients by different providers. This judgment rests upon the fact that the BCBSD methodologies have relied upon identical CPT codes as basis of cost comparison and have enhanced comparability by further segmentation of identically-defined services to the common “regions” (i.e., three separate counties) for cost comparison of the identical CPT code-defined services.

1. Data generation from twelve consecutive months of utilization, based on dates of service, with three months of utilization data after the 12 months.

The extra three months of data added to the yearly 12 months of data should help to smooth out any volatility and swings in service activity, and thereby should be more representative of patient demand as well as the utilization of medical providers. Put differently, the 15 months of data should even out the very high and lows (peaks and valleys) that may be manifested in the costs of services and thus reflect more service costs more reflective of normal service activities.

2. The range of the CPT codes for selection of surgical and radiology services.

The CPT codes utilized for the analysis of outpatient surgical services were comprehensive, encompassing the services and procedures specified in the AMA’s CPT Codes. The CPT codes used for the BCBSD cost evaluation covered the entire range of

services and procedures for which medical facilities and medical professional could submit claims for surgical activities. The codes utilized in the BCBSD cost analysis of outpatient surgery services ranged from 10021 to 69644.

For outpatient radiology, the separate codes for Diagnostic Radiology (or Diagnostic Imaging) services and procedures that delineate imaging parts of a patient's anatomy were not utilized. If this approach were followed, then the cost determination would have conducted for a very considerable number of service units encompassed by the separate CPT codes. The CPT codes encompassed a large quantity of service designations that a span codes from 70010 to 79999. This "disaggregated" approach would have generated an assortment of cost categories based on each type of imaging technology utilized for different parts of the anatomy.

The BCBSD cost determination methodology employed an alternative approach to the individual CPT radiology codes. Instead provider claims for the separate service units specified for patient anatomy were "collapsed" or aggregated according to the following types of imaging technologies performed : MRI (magnetic resonance imaging), CT (computer tomography, or CAT) scans, MRA (magnetic resonance angiography), and "OTHER" imaging/radiology services. In general, this analytical orientation seem reasonable since each technology is characterized by its own differential cost behavior, and their service charges are based on substantial fixed costs of the purchase of the (capital) equipment that is allocated (amortized) for each service usage. Put differently, the costs incurred for service delivery are more similar within a technology and different across technologies. A potential difficulty is the cost category of "OTHER" may encompass several different imaging technologies (Ultrasound, Fluoroscopy, Nuclear Medicine, and X-Rays) whose cost behavior

may be too dissimilar for comparison of costs (average amount of allowables) across providers. The received data description did not signify what is subsumed under OTHER. The data indicate considerable variation in the unit cost (Global amounts) of providers. It is unclear whether there are substantial differences in billings (concomitantly Global amounts) among providers for services because of differential charges, or the variation in Global amounts is a product of the grouping of disparate technologies subsumed under the category of OTHER. If it would be productive to undertake further disaggregation of the OTHER category into the subsumed subcategories of technologies (if in fact they are subsumed) depends to some extent on whether the separate technologies would result in sufficient number of providers' observations of Global amounts for the individual technologies to allow cost comparison and ranking among providers.

3. The comparability of CPT codes utilized for data selection among alternate sites and the outpatient and radiology settings.

The comparability of CPT codes utilized for data selection a central assumption of BCBSD's analytical approach to cost determination. The CPT codes do provide a description of the various types of service that medical facilities and personnel provide to a patient. If costs of medical service provision by different providers are to be compared, they should be evaluated for the same if not identical service unit or units. This objective can be accomplished in principle by using CPT codes as has been done by BCBSD with their cost methodologies. The CPT codes finely delineate specific medical services/activities for many categories of services of which surgery and radiology are two.¹ When a medical facility

¹ The other medical service/activity categories are Evaluation and Management, Anesthesiology, Pathology and Laboratory, and Medicine excluding Anesthesiology)

and/or medical personnel perform services for a patient's medical episode, they must signify the different service units that are provided in accordance with the description given in the CPT codes, each of which are comprised of five digits. A particular code number defines a particular service so that service units are standardized for their content. Consequently, if medical facilities and/or medical personnel submit service claims (to an insurer) by a specific code, all such facilities and/or personnel are indicating that they have provided the same service/activity to a patient. Therefore the evaluation of the costs of the same CPT-defined service unit across providers should yield reasonable bases for comparison to determine cost differentials of the service/activity.

4. Separation of analysis and data summary (of costs) at the county level, by facility, and by code levels, to conduct regional analysis.

BCBSD's methodological approach to the regional analysis of provider costs augments the cost comparison of the same services among providers. As stated above, the use of the identical CPT codes facilitates the comparison of the pricing of the same service by different providers. However, given the variation in income, the economies, and age structures of the three Delaware counties, there are likely to be differences in labor and factor markets which could contribute to different price levels and variations in prices for the production of medical services among the three regions. More specifically, the production of medical services of each county may be constrained by differences in the costs of labor, rent, land, buildings and materials and supplies. Consequently, these market differences could result in variations in the prices charged by providers in the separate counties. Comparability of service delivery among providers is further refined by segmenting providers of the same

service unit (i.e., the identical CPT code) according to the counties where the providers are located. This grouping allows comparison of the service costs of providers that compete in the same economic and social environment, and thus are subject to the same economic, social, and labor market forces that determine their charges for a service.

5. Comparison of an average amount of allowables at different sites.

The comparison of the average amount of allowables at different medical care sites is a reasonable basis for comparing the cost differences among providers of the same service. As described in the methodology section, the average amount of allowables is the average or unit costs figures used for comparing the costs of a defined CPT code service unit. For radiology services, the global costs are constructed with the average allowable amounts of either standalone sites or hospital sites with combined facility and professional charges. For outpatient surgery services, the average cost for a site is the total amount of allowables in dollars divided by the number of claims by a facility.

Consideration of the appropriateness of comparing the average of allowable amounts involves several interrelated dimensions. First, it is assumed that the criteria for determining the allowable amounts are applied similarly and consistently for all providers. Second, the allowable amounts should be applied consistently for the same service unit across all providers, as has been done through the use of the identical CPT code for a particular service that is compared. Third, the average (or unit cost) amount of allowables for a provider at different site permits a smoothing out of the variation in the allowable amounts of providers for all their separate claims for a particular service, -- a behavior that which the data distinctly shows. In so doing, the average allowable amounts also smoothes

out the variation in a providers' submitted billings (charges) for a CPT defined code of service. Since they are derived from its submitted billings, a provider's average amount of allowables for a service is representative of the typical or expected cost that is incurred for the delivery of that specific service. In effect, the average amounts of allowables, and inferentially the providers' bills, are indicative of how providers have "managed" their service delivery resources and priced the services, with higher average billing reflecting higher charges and costs. Thus arraying the average amount of allowables paid for a particular CPT defined code service delivered at different medical sites would yield a comparative perspective or picture of the cost differential among providers of the same service.

6. The rankings criterion, inclusive of breaking points of the scale, to determine the appropriate order and categories of cost levels.

As stated in the section on BCBSD methodology, the estimated unit costs of providers of a particular outpatient radiology service/procedure and a particular outpatient service/procedure are ranked from low costs to high costs. Then ratings are applied to the ordered costs; the scale used ranges from one to five with one the lowest and five the highest costs. Each rating demarcates mutually exclusive categories of cost levels. BCBSD refers to this ranking of cost levels as "Zagot" ratings. In principle, the ranking of providers' average amounts of allowables is quite a productive mechanism to compare providers' service delivery. The ordering of costs and establishing categories of cost levels with breaking points delineated by a one to five scale is fruitful approach because of the stipulations of the BCBSD's methodology that guides the cost determination of provider

service delivery. The cogent analytical and conceptual issues of this methodology are addressed directly in assessment dimensions numbered 3, 4, 5, and 10.

One, the unit cost estimates of (a) the average amount of allowables for outpatient surgery, and (b) the Global amounts for outpatient radiology services are separate costs calculated for the same defined CPT code service or procedure conducted by each provider; this process promotes the comparison of comparable providers' service categories. Two, the comparability of providers' cost estimates is further enhanced when providers' cost estimates are segmented according to separate three counties where the providers are located. Such segmentation facilitates the "control" the impact of different factors that are cost drivers within the regions. Three, averaging of providers' allowables and thus indirectly their submitted billings, means that the smoothing produces cost estimates that are more representative of providers' cost behavior; i.e., monetary values more reflective of the likely or expected costs of service provision over time.

Once the comparable costs of a service/procedure among providers by county are estimated, providers' costs can be compared properly and validly by the ordering of providers' costs in ascending order of their (unit cost) dollar values, with larger values of costs indicating higher provider costs. If a numerical scale (or even an alphabetical one) is assigned to the ordered costs, the resulting ratings then the scale will parallel the rising ordered providers' costs, -- as BCBSD has done with the one through five with five highest costs. Such scaling is commonplace in empirical economics and healthcare analysis. (Whether one is low and five is high, or a reverse rating scale of say five to one is used, is irrelevant since it is the signification of the order is known and acknowledged). The BCBSD assignment of a ratings to the ordered providers' cost estimates does produce categories of

costs levels, and the scale implies that there are breaking points that divides and places the range of all costs into five mutually exclusively classes of cost.

Three related points are pertinent to this result. First, the criterion or criteria for determining the breaking points that produce the ratings categories of cost, -- i.e. the categories of cost levels of one through five, -- should be articulated. At least three methods can be considered and they could be employed together. For some service/procedure, the breaking points in the ordered providers' costs could be easily detectable because "obvious" gaps prevail in the ascending costs array. The breaking points could also be demarcated on the bases of an assessment of the frequency distribution of the cost array. Or, the different breaking points and thus the categories of cost levels could be constructed by assigning the rating categories according the percentiles; a category would be delineated for every subsequent 20 percent of the observations in the case of the five point scale. Second, for some separate service/procedures, there may be too few providers with the consequence there could be limited bases for comparing cost differentials among providers. Third, for some procedures/services, there may be many providers but the ordered cost estimates could cluster and make it difficult to distinguish classes of cost.

- 7. The utilization of data of professional (physicians and other certified health personnel) claims three days prior and three days after the services were rendered as a basis of cost determination.**
- 8. The general determination that professional claims added to hospital outpatient/ASC service claims of one day results in an episode of care inclusive of all reasonable costs associated with surgeries.**

9. The rejection of not allocating claims with multiple lines for various categories of services (lab etc) to specific surgeries.

Assessment dimensions 7, 8, and 9 are addressed together since they involve interrelated issues about what is included in and excluded from the costs of outpatient surgery services.

As stated above, the BCBSD methodology for cost determination of outpatient surgery services involves the following calculation. An average of all allowable amounts was estimated for all claims for same service/procedure as defined by a CPT code service submitted by a provider for a 15 month period. There could be two sources of a provider's claims and thus two types of allowable amounts. Every claim entailed an allowed amount by a surgical facility (ASC) called a "facility amount", and most claims also encompassed an amount of allowables called a "related amount". This set of related amount of allowables represent payments for claims by professionals (physicians and other certified health personnel e.g., surgeons, anesthesiologist) that were submitted three days prior and three days after their role in a surgery.

The specification of these two classes of "allowables" for incorporation into the costs of surgery prompts several interrelated questions that BCBSD considered in its cost determination of outpatient surgery services as stated in assessments 8 and 9. The questions are: (a) whether accounting for the facility services on the day of the operation, and the professional services performed three days before and after a surgery comprises an episode of care, (b) whether the time frame of three days prior and after surgery is sufficient to encompass all relevant professional services, and (c) whether claims with multiple lines for various categories of services (lab etc) do not have to be introduced as components of an episode of care in order to capture all relevant surgical costs.

An EOC is a set of services provided to manage a specific medical condition of one patient over a specific time period. When an EOC is demarcated, medical care services are bundled together and delivered to a patient, and then a total fee, or bundle payment, is made for all the provided combined services. In general, the bundled or global fee comprises payments for the total cost of facility (e.g., hospital/inpatient or outpatient) services, physician services, and other relevant services that contribute to treating a patient's specific medical condition, i.e., the separate services are provided to one patient as a bundle for which there is an assigned single price. Compared to chronic illness, surgery is simpler to define as an EOC. As a modality for acute care, the bundling of surgery services is less complicated because the procedures encompassed by a surgery (a) transpire within a well-defined time frame, (b) are easily identifiable and (c) concomitantly, with service provision that is distinguishable, should allow rather straightforward designation of the resource used to the implement the services.² For surgery, an EOC would typically comprise the following services/procedures: (a) pre-surgical evaluation (a related evaluation and management, E/M, encounter including diagnosis, history and physical that would precede the date of the operation); (b) the actual surgery/operation performed by surgeons, anesthesiologists and assisting health care personnel; (c) charges for the operating room, and any equipment and devices used, and (d) post operative care, inclusive of immediate post operative recovery assessment, application of medication and supplies, compilation of notes of the operation, speaking with the patient's family and other physicians; writing of medical care orders; and follow-up care visits.

² With respect to a chronic diseases and long-term acute care, which is characterized by continuous illness and treatment, an episode of care would be specified for various services/procedures that have a therapeutic purpose, -- visits, consultations, treatment -- over agreed on time frame, say a year. However, service bundling and its pricing could be problematic because of clinical variation among patients with the same illness.

BCBSD's methodology of compiling both facility and professional allowables represents a reasonable determination of the costs of outpatient surgery services and it can also be considered as delineating an episode of care (EOC). The data used for cost estimation takes into account of the (a) facility costs inclusive of facility charges for operating room, devices, and equipment, and medical supplies as well as (b) costs of health care professionals (physicians and other certified health personnel e.g., surgeons, anesthesiologists) directly engaged in or their indirect contribution to pre-operative and post operative care for a patient that occurs not only on the day of surgery. These pre-operative and post operative services encapsulate the scope of procedures and services directly applicable to a patient's surgery. However, classification of outpatient surgery services as an EOC must be viewed as having some seemingly unavoidable limitations.

In the pre-operative period, some evaluation and management services precede an outpatient surgery but they also are a basis of the preparation and decision to perform an operation. Diagnostic procedures, radiology, and laboratory testing that involve assessment of symptoms to confirm a diagnosis and determine a course of treatment are excluded from the outpatient surgery EOC. In post-operative period, some follow up, and perhaps major, medical services are left out as components of outpatient surgery classified as an EOC. Longer term rehabilitation (beyond three days) inclusive of therapy, laboratory testing, and evaluation and management of consequences outcomes of surgery on patients were not included as services/procedures of the EOC of outpatient surgery.

The excluded pre-operative services/procedures could occur over a long time frame before a decision is made to undertake surgery. Such a set of long term medical activities could make it difficult to construct an operational definition of an EOC for outpatient

surgery. Moreover, attributing the above-stated pre-operative services/procedures to outpatient surgery as an EOC could encounter administrative complexity to the extent to which some services could also involve evaluation of multiple illnesses that complicate the allocation of the evaluation and management costs to surgery and other illnesses as well. For post operative services, the inclusion of longer term rehabilitation service would confound the cost analysis of outpatient surgery because of the likely patient to patient variation in recovery among patients who had the same type of surgery.

Alternatively, separate EOCs inclusive of the required surgery could be constructed according to the diagnosed illness. Such an undertaking is problematic because consensus is lacking in the medical profession and health care research, based in large part because of limitations on medical knowledge about course of illnesses and the impact of medical care (including operations pharmaceuticals), and patient to patient variation in both the intensity of an illness and patient response to treatment. In this respect, an EOC would be very complex in service delivery, with difficulty encountered to define appropriate services and levels, and thus difficult to specify bundled payments based on an EOC is very complex to develop. Moreover, this approach would obviate the purpose of establishing an EOC for outpatient surgery that is more amenable to delineation as an EOC and can become a basis of cost control of a “required” acute care intervention.

Outpatient surgery comprises a discrete scope of services provided for acute care within in short time frame. It is acute in terms that a specific medical condition of a brief illness is addressed and patients are ambulatory and require minimization of aftercare since surgery is to directly address the medical condition. The objective of the acute outpatient surgical care is to discharge a patient as soon as the patient illness is remedied, after which a patient

could require further acute care treatment for longer term recovery. For example, the services/procedures directly to conduct colonoscopies could become an EOC, but any services/procedures, e.g., either oncology or surgery that are provided or both, of a resulting diagnosis of colon cancer could be viewed as another episode of care. In principle, there is a strong basis to delineate the pre-operative and post operative of outpatient surgery to establish them as an EOC as BCBSO has formulated, and to estimate the costs of these separate services/procedures for the purpose of setting bundle payments.

This leads to the question of whether claims for services provided three days before and three days after the outpatient operation are sufficient to demarcate outpatient surgery services as an EOC. If outpatient surgery services are viewed as acute care, an issue that arises is whether some health professional charges within the BCBSO approved acute services would be left out because they preceded or exceeded approval date. That is, it is unclear whether three days are sufficient time frame for the sanctioned pre-operative and post operative services/procedures to be received and recorded. Such activity could vary by the type of outpatient surgery. No evidence of this exclusion, however, was supplied for the present appraisal.

The issues involving what service claims should be included and excluded as well as the time frame of outpatient surgery services when they are classified as an EOC may not be easily resolved. However, a position that should be acknowledged is BCBSO's standardization of what is meant by the EOC for outpatient surgery care is an important step for estimating costs and the control of health care (outpatient surgery). Despite that variations may exist among types of surgery (CPT defined codes), a clear, complete and specific definition of what constitutes an EOC is essential to derive a known set of bundled

payments (the average amount of allowables for facility and professional services/procedures) that providers can expect as reimbursement for their claims. With BCBSD cost determination based on different CPT codes for different types of surgery, comparability of the costs estimates and thus bundled payments are enhanced. In addition to standardization of services, what is also essential is that consistency in application of the EOC defined services across providers must prevail. Consistency in applying a standard definition of an EOC for outpatient services permits not only a more straightforward and understandable payment mechanism, but it could also foster competition among providers to supply outpatient services as defined by the same CPT code at comparable costs. Finally, it must be recognized that, with the demarcation of outpatient surgery services as EOCs, such delineation works administratively easier and more efficiently if a bundle payment is made to a single entity that in turn allocates to providers who participate in an EOC. The implementation of BCBSD's EOC approach to outpatient surgery services could be an incentive for providers of outpatient services to coordinate their services/procedures for the delivery of an episode of care to an individual patient. This issue is not within the purview of the present evaluation of the BCBSD cost methodology.

10. Inclusion of Ambulatory Surgery Centers (ASC), with low utilization, in the surgery analysis.

It is quite appropriate to include Ambulatory Surgery Centers (ASC) with low utilization in the analysis of outpatient surgery costs. This inclusion is justified because it enhances the comparison of outpatient surgery service among all providers that are compensated by allowed insurance payments. That is, comparability of service provision costs and the

achieving the objective of cost comparison require that all providers of same surgery service be incorporated into the analysis.

Utilization levels are in fact a major determinant of the fees that a medical facility charges patients for a particular service. An economic expectation is that if low utilization prevails in the long run at medical facility, there will be higher cost per patient because overhead costs would be charged across fewer patients. In this situation, cost per patient could be reduced through increased utilization whereby more patients would be treated in a time period, i.e., more patients would facilitate economies of scale through which lower cost levels per patient for a service would be realized. Low utilization and higher costs (with service quality equal across providers) may indicate that a facility is not employing its resources as efficiently as other facilities that have higher utilization with lower costs. Thus a cost (average amount of allowables) comparison of all providers of the same service would permit an assessment of the efficiency of the service delivery among various competing medical care providers. Such a comparison could be the basis of spurring incentives for efficiency improvement (or alternatively dropping the service), and exerting effective cost control over medical services.

11. For radiology, adding the professional component from free standing facilities to the technical component of hospitals to obtain global to global fee comparison.

As constructed by the BCBSD methodology, the cost determination and ranking of outpatient radiology services entailed a comparison of Global costs incurred at hospital sites and at standalone radiology sites. With radiology services for the same CPT defined code units, such an approach should produce an appropriate assessment of outpatient radiology

service costs among providers practicing at the two different types of medical care sites. Radiology services within a hospital setting include both technical and professional components subsumed under one concept to compile a total allowable amount from which an average costs, or the Global amount, is derived. That is, charges are permitted for the technical dimensions of radiology service delivery at the hospital facility and an allowable fee(s) for a professional element for services of radiologist personnel. The resulting joint Global amount is comparable to services delivery at stand alone sites (for the same CPT defined code) since both the technical components and professional components are combined or lumped into one allowed fee, a Global amount of a stand alone site. This one allowable amount comprises not only the allowable cost of the technical dimensions such as the use of imaging equipment and site operational and overhead “costs” but also compensation for radiologist personnel, the professional component of the radiology service unit delivered.