The role of DRGs & CCs in Medicare's Acute Care Prospective Payment System

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History and Overview

As you may know, there are many third party payers and insurances in the U.S.'s complex healthcare reimbursement system. Medicare is probably the most major third party payer as it is instituted by the government (Centers for Medicare and Medicaid) and is the primary form of insurance for most of the growing aging population. Medicare has many complex reimbursement systems by category of type of facility: one for inpatient acute care facilities, one for outpatient care facilities, one for skilled nursing care facilities, as well as one for physician practices and other kinds of healthcare organizations, providers, and suppliers.

Our discussion is focused on Medicare's present reimbursement system for inpatient (IP) acute care facilities: it is defined as the Acute Care Prospective Payment System. The original goal of the payment system was to limit the expenses that Medicare was incurring under the previous fee-for-service arrangement (an arrangement where total hospital costs are reimbursed in every case). This payment system was designed for IP stays in acute care hospitals and the primary player in the reimbursement system are the diagnosis-related groups (DRGs). The DRGs are categories in which a number of related conditions or procedures fall into.

You might find the history of DRGs interesting and I will present a few lines on that prior to getting into the nuts and bolts of their workings. Upon Congress's request, the DRG systemwas created by a Yale University group as a method for monitoring the quality of care and the extent to which services were used. Not until the New Jersey Department of Healthhad experimented with using DRGs as a system of reimbursement, did Congress pass a law (TEFRA) that made DRGs the standard for Medicare reimbursement for hospital inpatient stays. Specifically, the law (Tax Equity and Fiscal Responsibility Act) mandated the implementation of DRGs as a system of determining the reimbursement a hospital should receive for any one Medicare inpatient case: this implementation was to be completed by 1983.

The DRG system is based on individual hospital payment rates and DRG relative weights that are predetermined by the Centers for Medicare and Medicaid (CMS): the administrative governmental body that oversees and controls Medicare/Medicaid and all the related entities such as fiscal intermediaries and carriers.

Structure and Drivers of DRGs

Before we cover what drives the DRG and the role of CCs in that process, let's take a brief survey of the structure of DRGs. They are actually categorized by major diagnostic categories (MDCs). For example, under the MDC 6 Diseases and Disorders of the Digestive System, are listed DRGs 146-184 and 188-190 as they are related to the Digestive system. Most of the 538 DRGs are classified under one of the 25 MDCs. There

are a few procedural DRGs that are categorized to MDC 0. Within any one MDC, the DRGs are further divided into surgical and medical categories.

What drives the DRG: How is it decided that an inpatient case will be assigned or grouped to any one DRG? Of course if any of you have practiced with a grouper, you know that the diagnosis and procedure codes play a major role in determining the DRG. When a patient is discharged, the following data items are entered into the grouper to determine the DRG (there can only be one DRG assigned to a case): ICD-9-CM diagnosis and procedure codes, age, gender, and disposition (where the pt went after s/he was discharged). *[An aside is the fact that the facility ID, payor ID, and state also play a special role in this process:* we will briefly cover this at the end.] The major drivers of the DRG are the principle diagnosis and procedure codes and the secondary diagnosis codes that are complications or commorbidities (CCs).

The principle diagnosis is the condition, after study, which occasioned the patient's admission to the hospital: this reason must be determined after study or workup (diagnostic tests for suspected diagnoses) and after the patient's discharge. The term "after study" always sounded confusing to me so I am going to take a few minutes to explain it: after study means that the reason for admission cannot be determined until after the patient has been observed and has undergone tests to confirm his or her true diagnosis/condition. The admitting dx may be very different from the true reason for the patient's admission, determined after study.

For example, let's say the patient was admitted with the following diagnoses: hemoptysis, chest pain upon inspiration, and chest congestion. The physician decides to admit him for a workup to determine what the patient's pathology is: it could be pneumonia, lung cancer, etc. After study or workup (sputum cultures, biopsies, etc), it is determined that the patient has pneumonia. Well, the true principle diagnosis was not the admitting diagnoses but the condition after study that occasioned the patient's admission to the hospital: pneumonia.

The principle procedure is one of three things:
(1) a therapeutic procedure: one that is used to proactively resolve a pathology such as excision of malignant lesion as opposed to one that is
merely for investigative purposes [usually termed as a diagnostic procedure] as a laparoscopy,
(2) a procedure performed to treat a complication,
(3) the procedure that is most related to the principle diagnosis.

A complication is pathological condition that arises during the patient's stay such as a postoperative infection: it requires additional treatment and extends the length of stay by one day 75% of the cases.

A commorbidity is a pathology that was present upon admission such as congestive heart failure and requires additional treatment or extends the length of stay by one day in 75% of the cases.

Are you ready for action? Finally! Let's watch the drivers of DRGs in action

Website for grouping:
http://www.irpsys.com/cgi-bin/webplus.exe?Script=/irpsys/drgcalc.wml

Now that we have covered most of the basic terminology we are ready to sit back now and watch the magic of DRGs and see the effect of CCs thereon: Enter the following codes in a DRG grouper: 486. You should have DRG 089- simple pneumonia and pleurisy age > 17 w/o CC. Now enter 486 and 410.91; you should have DRG 090, the match to 089: the only difference that it has is "WITH" CC. The code 410.91 was a CC and its presence changed the DRG. Obviously this DRG would be a higher paying one than the one w/o CC. In our theoretical case, the MI was a complication. Be sure to note how the lower number of the DRG pair (DRG 89 instead of DRG 90) had the CC designation and therefore, it would have the higher DRG weight and resultant payment.

Let's try another example, this time a commorbidity: enter 682.6 and group. You should have DRG 278 Cellulitis age > 17 w/o CC. Now go back and put 682.6 & 428.0--notice that the DRG changed to 277 (Cellulitis ....w/CC). The congestive heart failure in our theoretical case was a commorbidity--in other words the patient already had that when he was admitted.

You could experiment with many more cases and not only look at the CCs and how they can potentially change the DRG, but also look at how the procedures or the principle dx changes it. The possibilities are endless and you will be learning how they work in the process. Upon a simple scan of the list of DRG descriptions in this Excel workbook, the DRG CC "pairs" will be obvious. I always thought these were fun to play with. With each inpatient case, look at the DRG list and the CC lists and try to determine what DRG you should have and then group the cases and see if your guess was correct.

In some cases, a CC may be present but yet not affect or change the DRG. Try entering 434.91 and 250.00 in a grouper and you should have DRG 014. Now add 481 (a CC) to the grouper and note that the DRG did not change. It will not change because DRG 014 is not one of a pair that has with and without CC. See how the principle diagnosis has a huge effect on the DRG? That is why it is so crucial to assign it correctly for proper reimbursement. And of course, the one of the DRG pair that has "w/CC" will have a higher relative weight and thus result in more reimbursement for the hospital. In fact, you can study the list of DRGs and just about guess which ones will have a higher relative weight: for example, the one of each pair that has "with" anything will have a higher weight that the one of the pair that has "w/o" something. You can also verify your educated guess by entering codes to get those different DRGs as I have already illustrated.

Now is the time to talk more about payment rates and relative weights and be able to determine what the reimbursement will be for any one DRG. Take DRG 015, its relative

weight is 0.94420. Let's say the hospital rate is $1,000. *[By the way, it should be easy to see why we need to know the facility ID in order to determine the exact reimbursement rate for any one facility/hospital because each one has its own assigned rate. Actually, this rate can be based or multiplied or simply adjusted by a number of additional local and special factors including, but not limited to, whether they are classified as being in a rural area or an urban area and other additional special costs that may be incurred such as for medical education in a teaching facility or costs for serving a unusually large number of low-income patients.]* To calculate the reimbursement, we multiply the relative weight by the payment rate (0.94420 times $1,000 = $944.20). It should be easy to see that if our DRG has a
relative weight of 3.12561, our reimbursement would be about three times more than we had before(3.12561 times $1,000 = $3125.61). This is why it is so crucial to properly determine the correct DRG.

A few odds and ends

I have heard of the term **case mix index** and never understood what it meant or how to calculate it? A discussion about DRGs is not complete without mention of the case mix index and the part that DRGs play in determining this common and important variable. I am going to make up a situation to illustrate how to calculate this variable. It is very important to understand and know how to calculate what is termed as the hospital's case mix index. The index is basically an indication of the average weights of all the DRGs that the hospital ends up with after a number of discharges. It is a small measure of the severity of the cases that the hospital treats. As you may recall, the more severe conditions/cases are assigned a DRG that has a higher relative weight.

Refer to the table to the below: to calculate the case mix index, we use the basic averaging principles. First we multiply each DRG rate by the number of cases that the hospital had for that DRG. The results of that calculation are illustrated in column D. Next we add the products in column D for a total sum of 158. We then add all the cases for each DRG (the numbers in column C) for total sum of 111. Our last step is to take the sum of the rates that we multiplied by the number of cases (158) and divide that by the sum of the number of cases (111) to end up with our average: 1.4234 case mix index.

To interpret this figure, consider it like this: when you average out each inpatient case with its DRG rate in relation to the number of cases that are assigned each different DRG rate, you end up with 1.4. You can sort of verify this number by visually examining your data and asking yourself this question. Does it look like this hospital had about an equal number of cases with a DRG weight that was over 1.4 and about an equal number of cases with a DRG weight that was under 1.4? The implications of this index is a measure of the severity of the cases the hospital treats...the theoretical base comparison index is usually 1.0000. Hospitals with an index under 1 are considered to have less severe cases than those with an index above 1.

A.	B.	C.	D.

Mock DRG	Mock DRG rates	Mock # of discharge cases for the particular DRG	
225	1	12	12
543	3	5	15
123	2	35	70
346	5	7	35
023	0.5	52	26
Totals for columns C and D:		111	158

Whatever is "**DRG creep**?"
This is a term used to describe a statistical change in the case mix index for a hospital that has fraudulent implications if the true severity of the cases the hospital treats has not changed. The hospital's case mix index gradually increases due to the fraudulent assignment of diagnoses (PDX and/or CCs) that result in more cases that have DRGs with higher relative weights. The assignment of these diagnoses codes are not substantiated by the documentation in the medical record. This practice should be judiciously avoided.

I want to throw "**outliers**" out the window--what are they?
Recall that the DRG system was instigated to cut the amount of costs that Medicare was incurring to pay for inpatient hospital stays. Also, recall the that previous system of reimbursement was one where the facility was simply paid the amount that they charged: at least what it cost for them. The predetermined rates for reimbursement were either more or less than the actual costs incurred in providing the service. The hospitals obviously faced a challenge in the cases where the reimbursement they received was less than what it cost them to provide inpatient services to their patients. Medicare makes provision for those cases where the reimbursement that the DRG dictates is significantly lower than the true cost of care for the hospital. (The exact difference is dictated by Medicare.) These cases are called outliers.

Non-Surgical/Non-OR Procedures: Certain non-surgical procedures or non-operating room procedures can also affect the DRG in certain circumstances. These types of procedures are usually performed without the patient having to be taken to the operating room. In all the cases that the non-OR procedure affects the DRG, two circumstances have to be in place: (1) the principle diagnosis has to be related to the non-OR procedure as is evident by the DRG description, and (2) there must not be an any additional procedures coded that do not relate to the principle diagnosis. If either of the aforementioned conditions are not present, the DRG will be not be affected by the non-surgical or non-OR procedure. In the case that the second condition is not met, and there are additional procedure codes assigned that do not relate to the principle diagnosis, the DRG will become a surgical DRG. The DRG pair that includes the phrase “with a certain procedure” will always carry a greater weight that the other pair that states “without a certain procedure.”

Here is an illustration: access a DRG grouper and enter the following code: 434.91. Group the case and note the DRG—it should be DRG 014—Intracranial Hemorr or cerebral infarct with a weight of 1.211. Now enter the following codes: 434.91 and procedure code 99.10. Group and you will see that the DRG changed to 559—acute ischemic stroke with use thrombolytic agent with a weight of 2.2513. If the inpatient case involves the procedure 99.10, you should include the assignment of that code because its assignment affects the DRG. Now go back and code 574.20 as PDX, 434.91 as secondary dx, 51.22 as principle procedure, and 99.10 as secondary procedure. You should get a DRG of 197 (Cholecystectomy, except by laparoscope w/o CDE w CC). This DRG is not affected by the non-OR procedure; rather it was changed based on the PDX and the related procedure. Now place 434.91 as PDX and add 574.20 as ODX and add procedure code 51.22. Now, the DRG changes to a surgical DRG, namely the 468 DRG Extensive OR Procedure unrelated to principle diagnosis. This sort of situation leading to DRG 468 is avoided when at all possible. Oftentimes a procedure of this nature is not performed during the inpatient stay, but scheduled as an outpatient procedure for some time after discharge if possible.

Another illustration: enter this set of codes: 292.0, 304.00, E980.0—group. You should have DRG: 523—alc/drug abuse, depend w/o rehab w/o CC with a weight of 0.4182. Now enter the same codes, but add 94.66; group. You should have a different DRG: 522 alc/drug abuse, depend w/ rehab w/o CC with a DRG weight of 0.6008.

One more example, enter the following codes: 518.81; 428.0; 96.70; 96.04. You should have DRG: 566 resp system dx with ventilator support (DRG weight 2.3335). Now delete the procedure codes and group and you should have a different DRG: 87 Pulmonary edema and respiratory failure (weight: 1.3835).

C/C Exclusions: As stated earlier, sometimes the codes designated as CCs do not affect the DRG. It all depends on which principal diagnosis is assigned. Each CC has a list of PDX codes which, if assigned, will cause that CC not to change the DRG. It is called the exclusion list for that specific CC code. For example, if 996.63 is entered as PDX and 599.0 as a secondary diagnosis, the result is DRG 034: “Other disorders of nervous system w/CC”. However, if 996.64 is entered with 599.0, the result is DRG 321: “Other kidney, urinary tract infection w/o CC” – even though a CC was coded. The apparent contradiction is explained by the fact that one of the codes from the exclusion list for 599.0 is 996.64.

This example underscores, once again, the importance of assigning the correct PDX. Oftentimes, the code that would usually affect the DRG will not affect it because the code is in the same anatomical or pathological category as the principle diagnosis. In our example above the principle diagnosis was infection-related and therefore the UTI code would not affect the DRG. However, another diagnosis from an unrelated body system would likely affect the DRG because it would not be related to the principle diagnosis.

Final Tidbit: the details of the **payer ID and the state** and how they play a part in determining the DRG are outside the scope of this discussion but everyone should know

that for any facility in the state of Maryland, the system for inpatient reimbursement is totally different. And it should be noted that for third party payers and insurances other than Medicare, they may have a DRG system as well, but it is a modified version of the system that Medicare uses.

References: Schraffenberger, Lou Ann. (2002). Effective Management of Coding Services
edited by Lou Ann. Published by AHIMA.

Latour, Kathleen & Eichenwald, Shirley. (2002). Health Information Management: Concepts,
Principles, Practice. Published by AHIMA.

Appendices:

General categories of CCs

- complications, including post operative
- severe developments such failure of organ, shock, severe trauma, or complications resulting from trauma
- chronic/severe pathologies such as COPD, AIDS
- ulcers/fistula/hernia/perforation
- hemorrhage/bleeding/hematoma (severe); or other conditions WITH hemorrhage
- abscess/cellulitis/infections/inflammations
- acute conditions of chronic pathologies such as uncontrolled diabetes, accelerated/malignant hypertension
- other acute conditions such dehydration & other metabolic imbalances, urinary retention, etc.

Common DRG-related abbreviations:	
O.R.	operating room (procedure)
dx	diagnosis

G.I.	gastrointestinal
CDE	common bile duct exploration
MDC	Major diagnostic category
CC	complication or commorbidity
dx	diagnosis-related group
PDX	principle diagnosis
ODX	secondary (other) diagnosis
CC	complication or commorbidity
>	greater than
<	less than
w/	with
w/o	without