Design and Development of the Diagnosis Related Group (DRG)

Prospective payment rates based on Diagnosis Related Groups (DRGs) are the basis of Medicare's hospital payment system. The DRGs are a patient classification scheme which provides a means of relating the type of patients a hospital treats (i.e., its case mix) to the costs incurred by the hospital. The design and development of the DRGs began in the late sixties at Yale University. The initial motivation for developing the DRGs was to create an effective framework for monitoring the quality of care and the utilization of services in a hospital setting. The first large-scale application of the DRGs was in the late seventies in the State of New Jersey. The New Jersey State Department of Health used DRGs as the basis of a prospective payment system in which hospitals were paid a fixed DRG specific amount for each patient treated. In 1982, the Tax Equity and Fiscal Responsibility Act modified the Section 223 Medicare hospital payment limits to include a case mix adjustment based on DRGs. In 1983 Congress amended the Social Security Act to include a national DRG-based hospital prospective payment system for all Medicare patients.

The evolution of the DRGs and their use as the basic unit of compensation in Medicare's hospital payment system represents a recognition of the fundamental role which a hospital's case mix plays in determining its costs. In the past, hospital characteristics such as teaching status and bed size were used to attempt to explain the substantial cost differences which existed across hospitals. However, such characteristics failed to adequately account for the cost impact of a hospital's case mix. Individual hospitals attempted to justify higher costs by contending that they treated a more "complex" mix of patients; the usual contention being that the patients treated were "sicker." Although there was consensus in the hospital industry that a more complex case mix resulted in higher costs, the concept of case mix complexity had historically lacked a precise definition. The development of the DRGs provided the first operational means of defining and measuring a hospital's case mix complexity.

The concept of case mix complexity

The concept of case mix complexity initially appears very straightforward. However, clinicians, administrators, and regulators often attach different meanings to the concept of case mix complexity depending on their backgrounds and purposes. The term case mix complexity is used to refer to an interrelated but distinct set of patient attributes which include severity of illness, prognosis, treatment difficulty, need for intervention and resource intensity. Each of these concepts has a very precise meaning which describes a particular aspect of a hospital's case mix.

- **Severity of illness.** Refers to the relative levels of loss of function and mortality that may be experienced by patients with a particular disease.
- **Prognosis.** Refers to the probable outcome of an illness including the likelihood of improvement or deterioration in the severity of the illness, the likelihood for recurrence and the probable life span.

- **Treatment difficulty.** Refers to the patient management problems which a particular illness presents to the health care provider. Such management problems are associated with illnesses without a clear pattern of symptoms, illnesses requiring sophisticated and technically difficult procedures, and illnesses requiring close monitoring and supervision.
- **Need for intervention.** Relates to the consequences in terms of severity of illness that lack of immediate or continuing care would produce.
- **Resource intensity.** Refers to the relative volume and types of diagnostic, therapeutic, and bed services used in the management of a particular illness.

When clinicians use the notion of case mix complexity, they mean that the patients treated have a greater severity of illness, present greater treatment difficulty, have poorer prognoses and have a greater need for intervention. Thus, from a clinical perspective case mix complexity refers to the condition of the patients treated, and the treatment difficulty associated with providing care. On the other hand, administrators and regulators usually use the concept of case mix complexity to indicate that the patients treated require more resources which results in a higher cost of providing care. Thus, from an administrative or regulatory perspective case mix complexity refers to the resource intensity demands that patients place on an institution. While the two interpretations of case mix complexity are often closely related, they can be very different for certain kinds of patients. For example, while terminal cancer patients are very severely ill and have a poor prognosis, they generally require few hospital resources beyond basic nursing care.

In the past, sometimes there was confusion regarding the use and interpretation of the DRGs because the aspect of case mix complexity measured by the DRGs was not clearly understood. The purpose of the DRGs is to relate a hospital's case mix to the resource demands and associated costs experienced by the hospital. Therefore, a hospital having a more complex case mix from a DRG perspective means that the hospital treats patients who require more hospital resources but not necessarily that the hospital treats patients having a greater severity of illness, a greater treatment difficulty, a poorer prognosis, or a greater need for intervention.

Patient classification

Given that DRGs were designed to relate a hospital's case mix to its resource intensity, it was necessary to develop an operational means of determining the types of patients treated and relating each patient type to the resources they consumed. While all patients are unique, groups of patients have demographic, diagnostic, and therapeutic attributes in common that determine their level of resource intensity. By developing clinically similar groups of patients with similar resource intensity, patients can be aggregated into meaningful patient classes. Moreover, if these patient classes cover the entire range of patients cared for in an inpatient setting, then collectively they constitute a patient classification scheme that provides a means of establishing and measuring hospital case mix complexity. The DRGs were therefore developed as a patient classification scheme consisting of classes of patients who were similar clinically and in terms of their consumption of hospital resources.

During the process of developing the DRG patient classification scheme, several alternative approaches to constructing the patient classes were investigated. Initially, a normative approach

was used which involved having clinicians define the DRGs using the patient characteristics which they felt were important for determining resource intensity. There was a tendency for the definitions proposed by the clinicians to include an extensive set of specifications, requiring information which might not always be collected through a hospital's medical information system. If the entire range of patients were classified in this manner, it would have ultimately led to thousands of DRGs, most of which described patients seen infrequently in a typical hospital. It, therefore, became evident that the process of DRG definition would be facilitated if data from acute care hospitals could be examined to determine the general characteristics and relative frequency of different patient types. In addition, statistical algorithms applied to this data would be useful to suggest ways of forming DRGs that were similar in terms of resource intensity. However, it was also discovered that statistical algorithms applied to historical data in the absence of clinical input would not yield a satisfactory set of DRGs. The DRGs resulting from such a statistical approach, while similar in terms of resource intensity, would contain patients with a diverse set of characteristics which could not be interpreted from a clinical perspective. Thus, it became apparent that the development of the DRG patient classification scheme required that physician judgment, statistical analysis and verification with historical data be merged into a single process. It was necessary to be able to examine large amounts of historical data with statistical algorithms available for suggesting alternative ways of forming DRGs but to do so in such a way that physicians could review the results at each step to ensure that the DRGs formed were clinically coherent.

Basic characteristics of the DRG patient classification scheme

Given the limitations of previous patient classification schemes and the experience of attempting to develop DRGs with physician panels and statistical analysis, it was concluded that in order for the DRG patient classification scheme to be practical and meaningful it should have the following characteristics:

1. The patient characteristics used in the definition of the DRGs should be limited to information routinely collected in hospital abstract systems.
2. There should be a manageable number of DRGs which encompass all patients seen on an inpatient basis.
3. Each DRG should contain patients with a similar pattern of resource intensity.
4. Each DRG should contain patients who are similar from a clinical perspective (i.e., each class should be clinically coherent).

Restricting the patient characteristics used in the definition of the DRGs to those readily available insured that the DRGs could be extensively applied. The patient information routinely collected in hospital abstract systems includes age, principal diagnosis, secondary diagnoses, and the surgical procedures performed. Creating DRGs based on information that is only collected in a few settings or on information which is difficult to collect or measure would have resulted in a patient classification scheme which could not be applied uniformly across hospitals.

Limiting the amount of DRGs to manageable numbers (i.e., hundreds of patient classes, not thousands) insured that for most of the DRGs, a typical hospital would have enough experience to allow meaningful comparative analysis to be performed. If there were only a few patients in each DRG, it would be difficult to detect patterns in case mix complexity and cost performance and to communicate the results to the physician staff.

It was concluded that the resource intensity of the patients in each DRG had to be similar in order to establish a relationship between the case mix of a hospital and the resources it consumes. Similar resource intensity means that the resources used are relatively consistent across the patients in each DRG. However, some variation in resource intensity will remain among the patients in each DRG. In other words, the definition of the DRG is not intended to be so specific that every patient is identical, but instead, the level of variation is known and predictable. Thus, while the precise resource intensity of a particular patient cannot be predicted by knowing to which DRG they belong, the average pattern of resource intensity of a group of patients in a DRG can be accurately predicted.

Since one of the major applications of the DRGs was to be a means of communicating with the physician community, it was agreed that the patients in each DRG must be similar from a clinical perspective. In other words, the definition of each DRG must be clinically coherent. The concept of clinical coherence requires that the patient characteristics included in the definition of each DRG relate to a common organ system or etiology and that a specific medical specialty should typically provide care to the patients in the DRG. For example, patients who are admitted for a dilatation and curettage (D&C) or a tonsillectomy may be similar in terms of most measures of resource intensity such as length of stay, preoperative exam, operating room time and use of ancillary services. However, different organ systems and different medical specialties are involved. Thus, the requirement that the DRGs be clinically coherent rules out the possibility of these types of patients being in the same DRG.

It was decided that a common organ system or etiology and a common clinical specialty was a necessary but not sufficient requirement for a DRG to be clinically coherent. In addition, all available patient characteristics which medically would be expected to consistently affect resource intensity should be included in the definition of the DRG. Furthermore, a DRG should not be based on patient characteristics which medically would not be expected to consistently affect resource intensity. For example, patients with an intestinal ulcer may or may not have an anal abscess. Although these patients are the same from an organ system, etiology, and medical specialist perspective, the DRG definitions must form separate patient classes since the presence of an anal abscess would be expected to consistently increase the resource intensity of the patients with intestinal ulcers. On the other hand, sets of unrelated surgical procedures cannot be used to define a DRG since there would not be a medical rationale to substantiate that the resource intensity would be expected to be similar.

The definition of clinical coherence is, of course, dependent on the purpose for the formation of the DRG classification. For the DRGs, the definition of clinical coherence relates to the medical rationale for differences in resource intensity. If, on the other hand, the purpose of the DRGs related to mortality, the patient characteristics which were clinically coherent and, therefore, included in the DRG definitions might have been different. Finally, it should be noted that the requirement that the DRGs be clinically coherent caused more patient classes to be formed than would have been necessary for explaining resource intensity alone.

Formation of the DRGs

The DRGs were originally developed at the Yale University School of Organization and Management during the 1970's under contract to the Centers for Medicare and Medicaid Services (formerly Health Care Financing Administration). The second version and all subsequent versions of the DRG definitions have been updated by 3M Health Information Systems under contract with CMS. All versions of the DRGs, since the inception of the Medicare Prospective Payment System, are summarized in the following table. DRG versions 2.0-24.0 and MS-DRG versions 25.0-32.0 were defined using the ICD-9-CM code set while versions 33.0 and later were defined with the ICD-10-CM/PCS code set.

Table 1. Grouper versions

Grouper version	Effective time period
MS-DRG 43.0	10/01/2025 - 03/31/2026
MS-DRG 42.1	04/01/2025 - 09/30/2025
MS-DRG 42.0	10/01/2024 - 03/31/2025
MS-DRG 41.1	04/01/2024 - 09/30/2024
MS-DRG 41.0	10/01/2023 - 03/31/2024
MS-DRG 40.1	04/01/2023 - 09/30/2023
MS-DRG 40.0	10/01/2022 - 03/31/2023
MS-DRG 39.1	04/01/2022 - 09/30/2022
MS-DRG 39.0	10/01/2021 - 03/31/2022
MS-DRG 38.1	01/01/2021 - 09/30/2021
MS-DRG 38.0	10/01/2020 - 12/31/2020
MS-DRG 37.2	08/01/2020 - 09/30/2020
MS-DRG 37.1	04/01/2020 - 07/31/2020
MS-DRG 37.0	10/01/2019 - 03/31/2020
MS-DRG 36.0	10/01/2018 - 09/30/2019
MS-DRG 35.0	10/01/2017 - 09/30/2018
MS-DRG 34.0	10/01/2016 - 09/30/2017
MS-DRG 33.0	10/01/2015 - 09/30/2016
MS-DRG 32.0	10/01/2014 - 09/30/2015
MS-DRG 31.0	10/01/2013 - 09/30/2014

Grouper version	Effective time period
MS-DRG 30.0	10/01/2012 - 09/30/2013
MS-DRG 29.0	10/01/2011 - 09/30/2012
MS-DRG 28.0	10/01/2010 - 09/30/2011
MS-DRG 27.0	10/01/2009 - 09/30/2010
MS-DRG 26.0	10/01/2008 - 09/30/2009
MS-DRG 25.0	10/01/2007 - 09/30/2008
CMS 24.0	10/01/2006 - 09/30/2007
CMS 23.0	10/01/2005 - 09/30/2006
CMS 22.0	10/01/2004 - 09/30/2005
CMS 21.0	10/01/2003 - 09/30/2004
CMS 20.0	10/01/2002 - 09/30/2003
CMS 19.0	10/01/2001 - 09/30/2002
CMS 18.0	10/01/2000 - 09/30/2001
CMS 17.0	10/01/1999 - 09/30/2000
CMS 16.0	10/01/1998 - 09/30/1999
CMS 15.0	10/01/1997 - 09/30/1998
CMS 14.0	10/01/1996 - 09/30/1997
CMS 13.0	10/01/1995 - 09/30/1996
CMS 12.0	10/01/1994 - 09/30/1995
CMS 11.0	10/01/1993 - 09/30/1994
CMS 10.0	10/01/1992 - 09/30/1993
CMS 9.0	10/01/1991 - 09/30/1992
CMS 8.0	10/01/1990 - 09/30/1991
CMS 7.0	10/01/1989 - 09/30/1990
CMS 6.0	10/01/1988 - 09/30/1989
CMS 5.0	10/01/1987 - 09/30/1988
CMS 4.0	10/01/1986 - 09/30/1987
CMS 3.0	05/01/1986 - 09/30/1986
CMS 2.0	10/01/1983 - 04/30/1986

The actual process of forming the DRGs was highly iterative, involving a combination of statistical results from test data with clinical judgment. During the formation of the DRGs there would often be several patient characteristics identified which appeared important for understanding the impact on hospital resources. The selection of the patient characteristics to be used and the order in which they would be used was a complex task with many factors examined and weighed simultaneously.

The development of the DRGs was begun by dividing all possible principal diagnoses into 23 mutually exclusive principal diagnosis lists referred to as Major Diagnostic Categories (MDCs). The MDCs were formed by physician panels as the first step toward ensuring that the DRGs would be clinically coherent. The diagnoses in each MDC correspond to a single organ system or etiology and in general are associated with a particular medical specialty. Thus, in order to maintain the requirement of clinical coherence, no final DRG could contain patients in different MDCs. In general, each MDC was constructed to correspond to a major organ system (e.g., Respiratory System, Circulatory System, Digestive System) rather than etiology (e.g., malignancies, infectious diseases). This approach was used since clinical care is generally organized in accordance with the organ system affected, and not the etiology. Thus, diseases involving both a particular organ system and a particular etiology (e.g., malignant neoplasm of the kidney) were assigned to the MDC corresponding to the organ system involved. However, not all diseases or disorders could be assigned to an organ system-based MDC and a number of residual MDCs were created (e.g., Systemic Infectious Diseases, Myeloproliferative Diseases and Poorly Differentiated Neoplasms). For example, the infectious diseases food poisoning and Shigella dysenteriae are assigned to the Digestive System MDC while pulmonary tuberculosis is assigned to the Respiratory System MDC. On the other hand, infectious diseases such as miliary tuberculosis and septicemia which usually involve the entire body are assigned to the Systemic Infectious Disease MDC.

Once the MDCs were defined, each MDC was evaluated to identify the additional patient characteristics which would have a consistent effect on the consumption of hospital resources. Since the presence of a surgical procedure designated as an operating room procedure would have a significant effect on the type of hospital resources (e.g., operating room, recovery room, anesthesia) used by a patient, most MDCs were initially divided into medical and surgical groups. The medical-surgical distinction was also useful in further defining the clinical specialty involved.

When the DRGs were formed, patients were considered medical if, during the admission, a procedure was performed that would not require the use of an operating room or if there were no procedures performed. Conversely, patients were considered surgical if they had a procedure performed which would require the use of the operating room. Since the patient data generally available did not precisely indicate whether a patient was taken to the operating room, surgical patients were identified based on the procedures which were performed. Physician panels classified every possible procedure code based on whether the procedure would be performed in the operating room in most hospitals.

Once each MDC was divided into medical and surgical categories, then, in general, the surgical patients were further defined based on the precise surgical procedure performed while the medical patients were further defined based on the precise principal diagnosis for which they were admitted to the hospital. In general, specific groups of surgical procedures were defined to distinguish surgical patients according to the extent of the surgical procedure performed. For

example, the procedure classes defined for the Endocrine, Nutritional and Metabolic MDC included amputations, procedures for obesity, skin grafts and wound debridements, adrenal and pituitary procedures, parathyroid procedures, thyroid procedures, thyroglossal procedures, and other procedures relating to Endocrine, Nutritional or Metabolic diseases.

Since a patient can have multiple procedures related to their principal diagnosis during a particular hospital stay, and a patient can be assigned to only one surgical class, the surgical classes in each MDC were defined in a hierarchical order. Patients with multiple procedures would be assigned to the surgical class highest in the hierarchy. Thus, if a patient received both a D&C and a hysterectomy, the patient would be assigned to the hysterectomy surgical class. It should be noted that as a result of the surgical hierarchy, the ordering of the surgical procedures on the patient abstract has no influence on the assignment of the surgical class and DRG.

In general, specific groups of principal diagnoses were defined for medical patients. Usually, the medical classes in each MDC included a class for neoplasms, symptoms, and specific conditions relating to the organ system involved. For example, the medical classes for the Respiratory System MDC included pulmonary embolism, infections and inflammations, neoplasms, chest trauma, pleural effusion, pulmonary edema and respiratory failure, chronic obstructive pulmonary disease, simple pneumonia and pleurisy, interstitial lung disease, pneumothorax, bronchitis and asthma, respiratory signs and symptoms and other respiratory diagnoses.

Generally, in each MDC, a medical and a surgical class was formed and referred to as “other medical diseases” and “other surgical procedures,” respectively. The “other” medical and surgical classes were not as precisely defined from a clinical perspective. The “other” classes included diagnoses or procedures which were infrequently encountered or not well defined clinically. For example, the “other” medical class for the Respiratory System MDC contained the diagnoses “other disorders of lung” and “congenital malformation of the respiratory system,” while the “other” surgical class for the female reproductive MDC contained the surgical procedures “excision of liver” (liver biopsy in ICD-9-CM) and “inspection of peritoneal cavity” (exploratory laparotomy in ICD-9-CM).

The “other” surgical class contained surgical procedures which, while infrequent, could still reasonably be expected to be performed for a patient in the particular MDC. There are, however, also patients who undergo surgical procedures which are completely unrelated to the MDC to which the patient was assigned. An example of such a patient would be a patient with a principal diagnosis of pneumonia whose only surgical procedure was a “destruction of prostate” (transurethral prostatectomy in ICD-9-CM). Such patients were assigned to a surgical class referred to as “unrelated operating room procedures.”

The process of defining the surgical and medical classes in an MDC required that each surgical or medical class be based on some organizing principle. Examples of organizing principles are anatomy, surgical approach, diagnostic approach, pathology, etiology, or treatment process. In order for a diagnosis or surgical procedure to be assigned to a particular class, it was required to correspond to the particular organizing principle for that class. For example, in the Urinary System MDC a surgical group was formed for all patients with a procedure on the urethra (i.e., organizing principle based on anatomy). This surgical group was then further divided based on whether the procedure performed was transurethral (i.e., organizing principle based on surgical approach).

Until the eighth version of the DRGs, the first step in the determination of the DRG had been the assignment of the appropriate MDC based on the principal diagnosis. The eighth version of the DRGs contained the first departure from the use of principal diagnosis as the initial variable in DRG assignment, as the initial step in DRG assignment was instead based on the procedure performed (PRE MDC). Beginning with the eighth version of the DRGs, if a patient has a heart transplant or implant of heart assist system, ECMO or tracheostomy, liver transplant and/or intestinal transplant, bone marrow transplant, lung transplant, simultaneous pancreas/kidney transplant, or pancreas transplant, then the patient is assigned to the PRE MDC DRGs independent of the MDC of the principal diagnosis, as these procedures are very resource intensive and can be performed for the treatment of diagnoses across several different MDCs.

As noted previously, the process of forming the DRGs was begun by dividing all possible principal diagnoses into 23 MDCs. The eighth version also created two new MDCs for patients with multiple trauma (MDC 24) and patients with human immunodeficiency virus (HIV) infection (MDC 25). The 25 MDCs are listed in table 2. Assignment to MDC 24 and 25 is based on both principal and secondary diagnoses. An assignment to MDC 24 is based on the presence of two or more significant traumas in different body systems (e.g. a fractured skull and a fractured femur). Assignment to MDC 25 is based on a principal diagnosis of an HIV infection or a principal diagnosis of an HIV related complication combined with a secondary diagnosis of an HIV infection (e.g. principal diagnosis of pneumocystosis and a secondary diagnosis of an HIV infection).

Once the medical and surgical classes for an MDC were formed, each class of patients was evaluated to determine if complications, comorbidities, the patient's age or discharge status consistently affected the consumption of hospital resources. Physician panels classified each diagnosis code based on whether the diagnosis, when present as a secondary condition, would be considered a substantial complication or comorbidity. A substantial complication or comorbidity was defined as a condition, that because of its presence with a specific principal diagnosis would cause an increase in length of stay by at least one day in at least 75 percent of the patients.

Each medical and surgical class within an MDC was then tested to determine if the presence of any substantial comorbidities or complications would consistently affect the consumption of hospital resources. The same basic list of complications and comorbidities was used across most DRGs. In addition, in some cases such as newborns or acute myocardial infarction patients, special complications and comorbidity definitions were used in defining the DRGs.

The final variable used in the definition of the DRGs was the patient discharge status. Separate DRGs were formed for newborns if the patients were transferred to another acute care facility. In addition, separate DRGs were formed for patients with alcoholism or drug abuse who left against medical advice and for acute myocardial infarction patients and newborns who died.

Table 2. Major Diagnostic Categories

MDC	Description
Pre-MDC	[blank]
1	Diseases and Disorders of the Nervous System

MDC	Description
2	Diseases and Disorders of the Eye
3	Diseases and Disorders of the Ear, Nose, Mouth and Throat
4	Diseases and Disorders of the Respiratory System
5	Diseases and Disorders of the Circulatory System
6	Diseases and Disorders of the Digestive System
7	Diseases and Disorders of the Hepatobiliary System and Pancreas
8	Diseases and Disorders of the Musculoskeletal System and Connective Tissue
9	Diseases and Disorders of the Skin, Subcutaneous Tissue and Breast
10	Endocrine, Nutritional and Metabolic Diseases and Disorders
11	Diseases and Disorders of the Kidney and Urinary Tract
12	Diseases and Disorders of the Male Reproductive System
13	Diseases and Disorders of the Female Reproductive System
14	Pregnancy, Childbirth and the Puerperium
15	Newborns and Other Neonates with Conditions Originating in the Perinatal Period
16	Diseases and Disorders of Blood, Blood Forming Organs and Immunologic Disorders
17	Myeloproliferative Diseases and Disorders, and Poorly Differentiated Neoplasms
18	Infectious and Parasitic Diseases, Systemic or Unspecified Sites
19	Mental Diseases and Disorders
20	Alcohol or drug use or induced organic mental disorders
21	Injuries, Poisonings and Toxic Effects of Drugs
22	Burns
23	Factors Influencing Health Status and Other Contacts with Health Services
24	Multiple Significant Trauma
25	Human Immunodeficiency Virus Infections

For versions 2.0-24.0 of the DRGs, the further subdivisions of some medical and surgical DRGs were primarily based on the presence or absence of a complication or comorbidity (CC) or pediatric age (0-17). For example, in DRG version 24.0 there were 115 pairs of DRGs subdivided based on the presence or absence of a CC and 43 pediatric DRGs (age 0-17). Beginning with version 25.0, the use of CCs and patient age was completely revised. The revisions were so extensive that the version 25.0 DRGs were renamed to the Medicare Severity DRGs (MS-DRGs).

Except for new diagnosis codes that were added to the ICD-9-CM classification (e.g., HIV), the CC list of diagnoses used in the DRGs remained virtually identical to the original CC list used in FY 1984. As a result of the changes that occurred in hospitals during the first 22 years of PPS, the CC list had lost much of its power to discriminate hospital resource use. Better coding of secondary diagnoses, stricter criteria for extended hospital stays, increased availability of post-acute care services and the shift to outpatient care resulted in most patients (nearly 80 percent) admitted to hospitals having a CC. Therefore, in version 25.0, with the implementation of MS-DRGs, the diagnoses comprising the CC list were completely redefined. The revised CC list was primarily comprised of diagnosis codes that described significant acute disease, acute exacerbations of significant chronic diseases, advanced or end stage chronic diseases and chronic diseases associated with extensive debility. In general, most chronic diseases were not included on the revised CC list. For a patient with a chronic disease, a significant acute manifestation of the chronic disease was required to be present and coded for the patient to be assigned a CC. The revision of the CC list reduced the number of Medicare patients with a CC from approximately 80 percent to 40 percent.

In addition, each diagnosis code was categorized as a major complication or comorbidity (MCC), a CC (i.e., non major CC) or a non-complication or comorbidity (NonCC) based on relative resource use. Approximately, 12 percent of all diagnosis codes were classified as a MCC, 24 percent as a CC and 64 percent as a NonCC. Diagnoses closely associated with mortality (ventricular fibrillation, cardiac arrest, shock, and respiratory arrest) were assigned as a MCC if the patient lived but as a NonCC if the patient died.

The MCC, CC and NonCC categorization was used to subdivide the surgical and medical DRGs into up to three levels. Before subdividing the medical and surgical DRGs into CC levels, all the pediatric age distinctions were removed from the DRGs. To create the MS-DRGs, individual DRGs were subdivided into three, two or one level depending on the CC impact on resources used for that patient. The two-way subdivision either created a separate level for just the MCC patients or a separate level for the NonCC patients. The CC levels relate to the relative severity of illness of the patient. In the MS-DRG version 25.0, 152 DRGs had 3 CC levels, 107 DRGs had two CC levels and 76 DRGs had no CC levels resulting in 745 MS-DRGs which was a net increase of 207 DRGs over the 538 in version 24.0. In MS-DRG version 25.0, there were 13,677 diagnoses and 3,768 procedures.

MS-DRG version 43.0 uses the ICD-10-CM/PCS code set effective October 1, 2025. In MS-DRG version 43.0 there are 74,719 diagnosis codes and 79,000 procedure codes. The following table provides the MS-DRG version 43.0 subdivisions:

Table 3. MS-DRG v43.0 subdivisions

Base MS-DRGs	Split Type	Total MS-DRGs
159	3-way	477
37	2-way MCC/CC and NonCC	74
72	2-way MCC and CC/NonCC	144
79	No split	79
347 Total Base	[blank]	774 Total MS-DRGs

In the September 1, 1987 final notice (52 FR 33143), we modified the DRGs so that certain diagnoses included on the standard list of CCs would not be considered valid CCs in combination with a particular principal diagnosis. Therefore, depending on the principal diagnosis of the patient, certain MCC and CC diagnoses may be excluded if they are closely related to the principal diagnosis. The CC Exclusions List was created for the following reasons: (1) to preclude coding of CCs for closely related conditions; (2) to preclude duplicative or inconsistent coding from being treated as CCs; and (3) to ensure that cases are appropriately classified between the complicated and uncomplicated DRGs in a pair.

The creation of the CC Exclusions List was a major project involving hundreds of codes. The excluded secondary diagnoses were established using the following five principles:

- Chronic and acute manifestations of the same condition should not be considered CCs for one another;
- Specific and nonspecific (that is, not otherwise specified (NOS)) diagnosis codes for the same condition should not be considered CCs for one another;
- Codes for the same condition that cannot coexist, such as partial/total, unilateral/bilateral, obstructed/unobstructed, and benign/malignant, should not be considered CCs for one another;
- Codes for the same condition in anatomically proximal sites should not be considered CCs for one another; and
- Closely related conditions should not be considered CCs for one another.

Summary

The MS-DRGs, as they are now defined, form a manageable, clinically coherent set of patient classes that relate a hospital's case mix to the resource demands and associated costs experienced by the hospital. MS-DRGs are defined based on the principal diagnosis, secondary diagnoses, surgical procedures, age, sex, and discharge status of the patients treated. Through MS-DRGs, hospitals can gain an understanding of the patients being treated, the costs incurred and within reasonable limits, the services expected to be required. The classification of patients into MS-DRGs is a constantly evolving process. As coding schemes change, as more comprehensive data is collected or as medical technology or practice changes, the MS-DRG definitions are reviewed and revised.