majority of patients with this disease believe that operation has improved the quality of their lives whether or not they have clinical recurrence, require reoperations, or end up with ileostomies.1

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REFERENCES

SOUNDING BOARD
DRG CREEP
A New Hospital-Acquired Disease

"Diagnostic related groups" (DRGs) have become the watchwords of the health-services research, regulatory, and planning agencies. Introduced in 1975 by Thompson et al.,1 they were intended as a means of grouping patients by discharge diagnosis to measure a hospital's output. These measurements are useful in analyzing and monitoring the hospital's resource utilization, performance, and costs. Today, the use of DRGs is virtually synonymous with case-mix measurement, and it has become the standard method to describe hospital outputs for any use.

This article is intended to provide a case report of "DRG creep," a new phenomenon that is expected to occur in epidemic proportions in the 1980s. DRG creep may be defined as a deliberate and systematic shift in a hospital's reported case mix in order to improve reimbursement. Some background review is necessary for the non-DRG specialist.

Traditionally, when a patient enters a hospital for a medical problem of any kind, the hospital gets paid by sending an itemized bill or claim to the patient or insurance carrier. These charges, which are individually set by hospitals, bear a variable relation to the hospitals' actual costs. Although certain medical conditions are excluded from specific insurance policies, and although audits of the appropriateness of the services may occur, our traditional form of charge-based reimbursement, generally speaking, is largely independent of the medical problem or diagnosis for which the services were rendered.

These conditions also hold true for cost-based reimbursement, which now applies to a substantial proportion of patients. For most patients covered by Medicare and Medicaid, hospitals are reimbursed for their services according to the costs of providing these services. These costs vary, and they are determined for each hospital through a complicated reporting and auditing process. Again, certain forms of utilization review or auditing can occur. The medical problem for which the services are provided, however, does not have a prominent role in the reimbursement process under Medicare or Medicaid. All patients in a hospital, regardless of their diagnoses, will generate the same reimbursement for a given service.

The relation between diagnosis and reimbursement is now changing because of two factors. These factors are related to the failure of existing mechanisms to control the rise in hospital costs. The first was the implementation of Section 223 of the Social Security Amendments of 1972, which for the first time allowed arbitrary limits on the amounts that would be reimbursed under Medicare. These limits are based on a comparison of costs for the same services among hospitals grouped according to capacity and geographic location. Hospitals whose costs exceed some cutoff point (e.g., the 80th percentile was used in 1979-1980) are reimbursed for services rendered to Medicare patients at the cutoff-point rate. The second factor was the advent of state rate-setting agencies, which, like their federal counterparts, adopted methods of limiting reimbursement.

The implementation of these limits led to the demand to recognize the obvious: It costs more to provide similar services to some patients than to others. Furthermore, some hospitals have more of these costlier patients than do others. Not surprisingly, the hospitals whose costs exceeded those allowed began to claim that they had a costlier case mix. These hospitals tended to be teaching hospitals, which have characteristics other than complex case mix that could account for increased costs. Thus, it was not clear to what extent the case-mix argument was valid.

The stage was set for a mechanism to compare the case mix among hospitals; unfortunately, no such mechanism existed. The only readily available means is the information available in hospital discharge abstracts. These documents typically contain demographic information plus a list of diagnoses and procedures that have been coded under a modification of the International Classification of Diseases (ICD) coding scheme. However, there are serious limitations in translating differences in ICD patterns to cost implications."3 The ICD code and its modifications...
are not intended to classify patients according to the costliness of their illnesses. Instead, the code is a clinical classification. Thus, within the same discharge code one would find, for example, a patient with a heart murmur admitted for cardiac catheterization, who was subsequently found to have mitral regurgitation and was discharged in three days, and a patient with mitral regurgitation who was admitted for valve replacement, with a stormy postoperative course and a four-week hospitalization.

The DRG method partly solves this problem. The source of information for this classification scheme remains the hospital discharge abstract. Under this scheme, all patients can be classified into one of 383 mutually exclusive groups (DRGs) by the principal discharge diagnosis, the secondary diagnosis or diagnoses, surgery and other procedures, and age. For these classifications to be developed, patients were first divided into 83 broad diagnostic groups based on the ICD code of the principal diagnosis. Typically, the lengths of stay within each group would vary widely. In order to reduce this variance, the groups were further subdivided according to other variables (such as the presence or absence of surgery or the patient’s age) to obtain the most homogeneous groupings within each major diagnostic category with respect to length of stay. The end result was the 383 DRGs. The rationale for using this case-mix measure for reimbursement was that length of stay, the dependent variable in determining DRGs, correlated reasonably well with total hospitalization costs.

Recent publications have pointed out certain shortcomings of the DRG technique. Nonetheless, this method is now widely accepted, and it is the basis for reimbursement experiments in several states. One of the more noteworthy experiments is being conducted in New Jersey, where participating hospitals are paid a prospectively determined amount for each hospital discharge; a substantial portion of that amount is determined by the DRG of the patient. A more systematic “optimization” of our discharge-abstract reporting, a computer program was written to determine the DRG for each patient as originally reported and then to redetermine the DRG, reversing the first and second listed diagnoses. Next, selecting the costlier sequence.

It is this latter possibility that has sent hospitals all over the country scurrying to their data-processing departments to examine their own DRG patterns. During this process at the University of California at San Francisco (UCSF), the potential for DRG creep became apparent.

From the UCSF hospital’s discharge-abstract data for 1978, a DRG-based case-mix index, similar to that proposed by the Health Care Financing Administration, was developed. Although the data for comparable hospitals were not available to us, it was obvious that our index could be made higher or more “costly.”

Since the DRG classification is highly dependent on the principal diagnosis, we made a closer examination of the sequence of our discharge diagnoses. We were aware of the recent Institute of Medicine study that indicated an error rate as high as 35 per cent in the identification of the principal discharge diagnosis on audited hospital discharge abstracts. A major source of this error was the sequence of listed diagnoses. Our own examination revealed some startling situations. For example, there were 159 patients in 1978 who had a major surgical procedure and who had chronic nephritis, chronic pyelonephritis, or some other renal disease listed as their second diagnosis. If the sequence of the first two listed diagnoses had been reversed in these cases, these 159 patients would have been classified in DRG 238, with an average charge of $9,322: “Disease of the Kidney and Ureter with Surgery (Kidney Removal, Kidney Transplant, Other Major).” Instead, because of a variety of principal diagnoses that were actually used (often the primary disease, such as systemic lupus erythematosus, that caused the renal disease), they were classified among 64 other DRGs (weighted average charge, $4,210). In many of these patients, it would be difficult to claim legitimately that the renal disease was truly the principal diagnosis. In many others, it could have been regarded as such. If the sequence of the first two diagnoses had been reversed in this single set of cases, there would have been a shift of the “costliness” of our case mix by over $800,000.

As an exercise to gauge the potential impact of a more systematic “optimization” of our discharge-abstract reporting, a computer program was written to determine the DRG for each patient as originally reported and then to redetermine the DRG, reversing the first and second listed diagnoses. Next, selecting the costlier of these two possible DRGs for each discharge, we determined that the “cost” of our case-mix index would have increased by 14 per cent during that year. In 23 per cent of the cases, the reversed sequence of the first two listed diagnoses would have been the costlier sequence.

Several observations regarding this form of DRG creep can be made. First of all, if UCSF had been under a reimbursement mechanism similar to that of New Jersey, and this method had been applied to the “editing” of our discharge abstracts, it would have resulted in an unprecedented windfall profit for the hospital. Secondly, although the method probably would have increased the number of incorrectly reported principal diagnoses, the increase might not have been noticed, since the base-line error rate is normally so high.

Thirdly, it is a blatantly unethical method.

One could imagine more sophisticated computer programs that would overcome some of the ethical objections. Tables for diagnostic combinations could be developed that would allow switching of the order of the first and second diagnoses in situations in which either could be legitimately considered the principal diagnosis. For example, congestive heart failure and mitral regurgitation constitute one such combination in which one so inclined would prefer the more costly
mortal regurgitation to be listed first. A less complicated computer program could simply audit the discharge abstracts and select for further review the cases in which an altered sequence of diagnoses would result in a more expensive DRG. Hospital personnel could then review these cases to see whether the altered sequence was appropriate. For example, our computer program discovered 66 patients with a surgical procedure and a secondary diagnosis of cardiac inflammation or valve disease. A chart audit of these cases indicated that the secondary diagnosis appropriately could have been considered the principal diagnosis in 23 instances. For example, a patient with known Marfan's syndrome was admitted for evaluation and treatment of congestive heart failure secondary to aortic regurgitation and subsequently underwent valve replacement. The physician's discharge diagnoses were listed, quite reasonably, as (1) Marfan's syndrome, (2) aortic regurgitation, and (3) congestive heart failure. Reversing the first two diagnoses would have been more "appropriate" and would have categorized the case into a more expensive DRG. We estimate that systematically applying this simple technique alone would shift the "cost" of our reported case mix by several million dollars annually.

There are other possible forms of DRG creep besides those generated by computers. Continuing physician "education" could certainly be implicated. There are legitimate medical vagaries and uncertainties in many diagnostic situations. When does abdominal pain and duodenal scarring on an upper-gastrointestinal-tract series become the more costly "probable duodenal ulcer"? When does "probable transient ischemic attack" become the much more costly "possible stroke"? Another factor is the increased yield of expensive and more sensitive diagnostic studies that would more than pay for themselves if they shifted the DRG. For example, the average charge for DRG 121 (myocardial infarction) is three times that for DRG 123 (angina pectoris), where many patients with "rule-out" myocardial infarction would be grouped if they did not meet the criteria for myocardial infarction on the basis of conventional tests.

Minor diagnostic nuances and slight imprecisions of wording have little practical clinical importance, yet under DRG reimbursement they would have major financial consequences. The implications of tying reimbursement to the vagaries, uncertainties, subtleties, and errors of discharge diagnostic reporting are unprecedented. It is hoped that hospitals will refrain from disseminating the more virulent forms of DRG creep; however, the potential for a broad spectrum of manifestations certainly exists. This potential raises the possibility of serious adverse effects on the entire cost-containment effort. There will be incentives to look a little harder and to perform that extra test or procedure to make a diagnosis. It will certainly be profitable for a hospital to invest in more sophisticated data-processing and discharge-abstracting systems. In the ensuing technologic arms race between the regulators and the regulated, it may be difficult to distinguish the disease from the cure.

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COFFEE AND CANCER OF THE PANCREAS

To the Editor: The recent article by MacMahon et al.* stirred up much reaction because it suggested a major change in the daily habits of many people. The possibility that some component in coffee could be responsible for the development of pancreatic cancer is an important one, and it lends itself to epidemiologic analysis. However, the data presented in this otherwise excellent paper may be flawed in one critical way. In selecting the controls, the authors included 105 hospitalized patients (in the total control group of 644) who had diagnoses of gastritis, enteritis, colitis, diverticulitis, or "other gastroenterologic conditions" (irritable bowel?), which may have caused these patients to avoid coffee intake. If a greater number of controls drank no coffee for this reason, the relative-risk determination may have been biased to make it appear that a greater percentage of patients with pancreatic cancer were coffee drinkers. The fact that the relative-risk figures did not rise with increasing coffee intake supports this criticism. I would like to know how many of the 32 control patients with no coffee intake had any of the above gastrointestinal problems and whether they avoided coffee because of the illness. Would reanalysis of the data, excluding these 105 patients, still show the association of coffee intake with an increased risk of pancreatic carcinoma?

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