
HOSPITAL ACQUISITION OF COMPUTER SOFTWARE PROGRAMS UNDER THE PROSPECTIVE PAYMENT SYSTEM

EFFECT ON CASE MIX INDEX



OFFICE OF INSPECTOR GENERAL
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EXECUTIVE SUMMARY

PURPOSE

This inspection assesses the possible impact of computer software used in medical records departments on Medicare reimbursement.

BACKGROUND

With the advent of the Prospective Payment System (PPS), hospitals began using computer software programs to improve the accuracy of their coding of medical records and to anticipate the amount of reimbursement they would receive. Two types of software are being used: the first, called encoders, assists hospital staff in translating medical record documentation into International Classification of Diseases - 9th Revision - Clinical Modification (ICD-9-CM) diagnosis and procedure codes; the second, called groupers, makes diagnosis-related group (DRG) assignments based on these codes. The software packages may contain a feature, called an optimizer, which presents comparative analyses of DRGs and may also resequence codes independent of the rules of coding.

Hospitals submit these ICD-9-CM codes to their Medicare fiscal intermediaries who convert them into the appropriate DRG for payment. Each DRG is assigned a numerical weight reflecting the relative costliness of providing care. To provide a comparative measure of the aggregate mix of patient DRGs among hospitals, a hospital-specific case mix index (CMI) is computed. The CMI is the weighted average of DRGs for that hospital's Medicare discharges.

The Prospective Payment Assessment Commission (ProPAC), a congressionally-established group responsible for evaluating PPS, expects case mix indices to increase over time due to changes in medical practice and in the inpatient population. However, PPS is not intended to pay for higher-weighted DRGs resulting from improvements in coding practices. In its June 1989 report to Congress, ProPAC estimates the cumulative increase in the per-case payment rates for the first six years of PPS was 42.6 percent.

ProPAC's 1986 informal survey, which measured the extent of medical record coding changes and the impact of encoder and grouper software on coding, concluded that coding practices are changing in response to PPS incentives. However, no quantification could be made of the extent of coding change nor the amount of case mix change attributable to changes in coding practices.

Under contract to the Office of Inspector General, the American Medical Record Association convened a conference in June 1988 of administrators of medical record departments on the proper use of software as well as possible abuses. The conferees' major finding was the belief that misuse of optimizers, that is, maximization, was rare.

METHODOLOGY

A stratified, two-stage, random sample of 250 hospitals was surveyed for information about grouper and encoder software acquisitions between January 1982 and June 1988. Data were analyzed to determine whether any relationship exists between acquisition of a grouper or encoder and changes in a hospital's CMI during the months following acquisition.

FINDING

Software Did Not Affect Case Mix Index

This analysis of software acquisition and Medicare case mix index data found that the presence of a grouper, an encoder, or both, did not have an independent effect on a hospital's CMI. This leads to the conclusion that the observed increases in CMI since the inception of PPS cannot be attributed to the acquisition of software by hospitals.

This finding supports the views and experiences of the administrators of medical record departments expressed at the American Medical Record Association conference discussed earlier.

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American Medical Record Association Conference Report

INTRODUCTION

PURPOSE

The purpose of this inspection is to assess the possible impact of computer software used in medical records departments on Medicare reimbursement.

BACKGROUND

Hospitals are reimbursed under the Prospective Payment System (PPS) based on the diagnosis-related group (DRG) into which a patient's medical condition is classified, with payment varying widely among 477 DRG classification categories. The PPS, administered by the Health Care Financing Administration (HCFA), results in payments to hospitals of more than \$30 billion a year.

Prior to PPS, hospitals had little financial incentive to review medical records and code descriptive billing information accurately or completely. Translation of medical record descriptions of diagnoses and medical procedures into numeric codes was done primarily for statistical purposes unrelated to reimbursement. Under PPS, hospitals now have financial incentives to more exhaustively abstract medical record data.

DRG assignment is guided by the identification and coding of the principal diagnosis and up to four secondary diagnoses indicating medical complications and comorbidities. Additionally, up to three procedures can be identified and sequenced based upon established rules of coding. Hospitals submit these International Classification of Diseases - 9th Revision - Clinical Modification (ICD-9-CM) codes to their Medicare fiscal intermediaries who convert them into a DRG for payment. In practice, however, most hospitals also independently identify the DRG.

Although such coding and sequencing can be done manually, hospitals have increasingly gone to computerization of the DRG assignment process. Numerous consulting organizations, accounting firms and computer companies have developed two main types of software: the first, called encoders, assists hospital staff in translating medical record documentation into ICD diagnosis and procedure codes; the second, called groupers, makes DRG assignments based on these codes.

Competition among vendors has produced a wide array of DRG software packages. The DRG modules may be independent systems or may operate as part of a hospital-wide information management system. They may contain features to track admission, intermediate, and final DRGs; to assist in quality assurance and utilization review functions; and to collect case mix data. Another feature, called an optimizer, queries the user for the presence of other diagnoses

or procedures, which could lead to a higher-weighted DRG. This prompts the user to explore patients' charts for the presence of additional evidence or to seek clarification from physicians. Optimizers may also resequence diagnoses and procedure codes independent of the rules of coding and produce alternative DRGs. They may thus be used to produce either a more accurate DRG or a DRG which inappropriately maximizes reimbursement.

The Case Mix Index - Each DRG is assigned a numerical weight reflecting relative hospital use of resources and thus the costliness of providing care. To indicate the comparative intensity of the aggregate mix of patient DRGs in a given hospital, HCFA computes a hospital-specific case mix index (CMI), which is the weighted average of DRGs for a hospital's Medicare discharges. Increases in the CMI, or higher comparative CMIs among hospitals, indicate higher average payments per discharged patient.

The Prospective Payment Assessment Commission - The Prospective Payment Assessment Commission (ProPAC) is a congressionally- established group responsible for monitoring and evaluating PPS and making recommendations to the Secretary and Congress on ways to improve it. ProPAC expects case mix indices to increase over time due to changes in medical practice and the changing characteristics of the inpatient population. These changes should be primarily due to practice trends such as (1) new and more costly technology causing cases to move to higher- weighted DRGs; and (2) PPS-induced movement of patients to outpatient care (reimbursed on the basis of reasonable cost) for potentially less-complex, low-weighted DRG cases. These constitute legitimate or "real case mix change." The PPS is intended to include compensation for this increased use of hospital resources on more complicated cases. Other factors influencing the case mix index are observed improvements in medical record documentation by physicians and changes in coding practices of medical record department staffs. However, PPS is not intended to pay for higher-weighted DRGs resulting from improvements in coding practices, since such improvements do not reflect increases in resources used in treating patients.

The ProPAC June 1989 report to Congress estimates the cumulative increase in per-case payment rates for the first six years of PPS was 42.6 percent. This increase (since 1983) is attributable to PPS payment policy decisions and to the assignment of patient discharges over these years to higher- weighted DRGs. Changes to higher-weighted DRGs account for 28.4 percent of the increase, or twice as much as the 14.2 percent increase (simulated) due to policy decisions. An example of the latter was the transition from a combination of hospital-specific and national rates to entirely national average rates.

The Commission has continuously addressed CMI increases in its studies and recommendations on maintaining and updating PPS. Each year it has acknowledged a lack of "definitiveness" in its estimates of real case mix change and of PPS coding-induced case mix change. Its 1986 informal survey, which measured the extent of medical record coding changes and the impact of encoder and grouper software on coding, concluded that coding practices are changing in response to PPS incentives. However, no quantification could be

made of the extent of coding change nor the amount of case mix change attributable to changes in coding practices.

The American Medical Record Association - Under contract to the Office of Inspector General, the American Medical Record Association (AMRA) convened a conference in June 1988 of administrators of medical record departments on the proper use of software as well as on possible abuses. The conferees' major finding was: "...the belief that misuse of optimizers, that is, maximization, was rare in practice; where maximization appears to have taken place, the cause most often is lack of knowledge or understanding of coding conventions and principles resulting in inaccurate coding." They recommended that to eliminate maximization, coding accuracy must be stressed. And, while they believe many safeguards are in place which contribute to accuracy, they identified several studies which can further enhance coding accuracy.

The executive summary of AMRA's conference report appears as the Appendix.

SCOPE AND METHODOLOGY

A random sample of 257 hospitals (stratified by bed size of less than 100 beds, 100-299 beds and 300 or more beds) was selected. Each hospital was requested to provide information about grouper and encoder software acquisitions between January 1982 and June 1988. All hospitals, except seven which had closed, provided information on dates of purchase or lease, the name of vendors and the types of software packages obtained.

The data from these 250 hospitals were analyzed to determine whether any relationship existed between acquisition of a grouper or encoder and changes in a hospital's CMI. For each hospital included in the sample, a monthly CMI was calculated based on all PPS discharges recorded on files maintained by HCFA as of September 30, 1988. Independent cofactors were developed that classified each hospital as to its geographic status (urban vs. rural), teaching status (teaching vs. non-teaching), and bed size. Along with these three cofactors, the total number of cases contributing to the construction of the CMI was included in a time series analysis. This time series analysis took the form of a regression model where the error term is an autoregressive process. That is, the value of the CMI for any month may be explained by the several independent cofactors as well as values of the CMI immediately preceding the current value. A full model was constructed which included all of the possible interaction terms among the independent variables. The result of such an analysis is to estimate coefficients for each cofactor, and any interaction terms created from the cofactors, in an equation, and then to test whether these coefficients differ significantly from zero.

FINDING

Software Did Not Affect Case Mix Index

This analysis of software acquisition and Medicare case mix index data found that the presence of a grouper, an encoder, or both, did not have an independent effect on a hospital's CMI. The coefficients for the presence of a grouper, an encoder, or both, did not differ significantly from zero. We would conclude from this analysis that we are not able, with this data, to distinguish an increase in a hospital's CMI due to the acquisition of this software.

This finding supports the views and experiences of the administrators of medical record departments expressed at the AMRA conference discussed earlier.

NOTE: Copies of the time series analysis and accompanying tables, as well as copies of the full AMRA conference report, are available on request from:

Office Of Inspector General
Health Care Branch
Room G-10-C East High Rise
6325 Security Blvd
Baltimore, MD 21207

APPENDIX A

AMERICAN MEDICAL RECORD ASSOCIATION CONFERENCE REPORT

The Issues of DRG Optimization from a Coding/DRG Grouping Perspective

EXECUTIVE SUMMARY

Purpose

One of the issues in evaluating the effectiveness and integrity of the Prospective Payment System (PPS) is DRG optimization and potential for maximization. The Office of Inspector General/Office of Analysis and Inspections requested that a Conference of American Medical Record Association (AMRA) members be convened to provide expert opinion on the proper use of aids available to manipulate information in medical records for DRG assignments.

Background

The PPS was mandated by Congress effective October 1, 1983. Under this system, hospitals are reimbursed, for inpatient services provided each Medicare patient, a specified payment based upon the case's classification into a diagnosis-related group (DRG). The DRGs are assigned from information submitted on hospital claims. Information required for DRG assignment includes the ICD-9-CM codes for the principal diagnosis and procedure sequenced first; complications, comorbidities, and other procedures; and the age and sex of the patient. Assignment of the appropriate DRG for the case requires complete identification and accurate coding of diagnostic and procedural statements from the medical record and the correct abstracting of other patient data.

Coding is the translation of verbal descriptions of diseases, injuries, and procedures into numerical descriptions. The ICD-9-CM classification system currently required for coding for DRG assignment was designed for the purpose of reporting morbidity and mortality information for statistical purposes, and for indexing of hospital records by disease and operations for data storage and retrieval. As such, coding supports clinical research and many other health data needs. The coding system, however, was not designed as a classification system for reimbursement. Thus, such use must be made with the full understanding that the nature of coding is reflective of the nature of medicine itself—it is not an exact science. There are specific conventions and principles governing coding, yet accurate coding is dependent upon a multitude of factors which are described in this report.

The nature of the coding process and its use in reimbursement have resulted in the development of coding aids. Among these are software aids:

1. Encoders are computerized aids to code assignment.
2. Editors are computer programs which check for logical errors in data abstracted from the medical record and code assignments.
3. Groupers are software which aids in branching through the DRG decision trees to assign a DRG.
4. Optimizers, which interface with encoders and groupers, are aids to selecting the optimal DRG.

Aids are not limited to software, however, for code books, newsletters, coding hotlines, and coding consultants are other ways hospitals are receiving official and unofficial coding guidance.

Findings

The AMRA members participating in the Conference found it necessary to begin by defining terms associated with coding and DRG assignment. Participants next turned their attention to studies on the extent of use of computer-aided coding, DRG assignment, and optimization. Only very limited information is available, and is summarized within the report. The major finding of the conferees was the belief that misuse of optimizers, that is, maximization, was rare in practice; where maximization appears to have taken place, the cause most often is lack of knowledge and understanding of coding conventions and principles resulting in inaccurate coding. The most important safeguard for preventing maximization or the appearance thereof, then, is to ensure coding accuracy through adequate training of coders, quality controls and other measures.

Several measures currently in place contribute to coding accuracy. These include the Joint Commission on Accreditation of Healthcare Organizations' Agenda for Change, improvements in physician documentation as a result of the need for more accurate coding, AMRA's Code of Ethics and Professional Practice Standards, educational programs in coding, cooperation between significant parties to resolve coding issues, management system features for some encoder products, system security, and individual hospital medical record committee review of documentation.

Several research studies which would further enhance coding accuracy are proposed in this report. These include analysis of hospital, PRO, and SuperPRO disputed codes, development of standardized methodologies and competencies for studies of coding accuracy, evaluation of

all coding and grouping aids, monitoring of the effectiveness of crosswalks between classification systems, and the more timely issuance of new codes and coding guidelines.

Recommendations

The recommendations resulting for the Conference focused on measures that could be taken to enhance understanding of the coding process and coding accuracy. The specific recommendations include:

- Utilize appropriate terminology in communications concerning coding and DRG grouping.
- Recognize the value of groupers, encoders, editors, and optimizers as aids to coding and DRG grouping which will enhance coding accuracy, and thereby ensure fair reimbursement for hospitals and appropriate expenditures for the Medicare program.
- Continue efforts to eliminate fraud and abuse in the Medicare program by continually monitoring for maximization by any means, including misuse of optimizers.
- Recognize the safeguards currently in existence which contribute to the enhancement of coding accuracy.
- Conduct studies to enhance coding accuracy, as discussed in the findings.
- Institute corrective actions to ensure coding accuracy.