



Chapter VII

**An Intelligent Data Mining
System to Detect
Healthcare Fraud**

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INTRODUCTION

There are various forms of fraud in the health care industry. This fraud has a substantial financial impact on the cost of providing healthcare. Money wasted on fraud will be unavailable for the diagnosis and treatment of legitimate illnesses. The rising costs of and the potential adverse affects on quality healthcare have encouraged organizations to institute measures for detecting fraud and intercepting erroneous payments.

Current fraud detection approaches are largely reactive in nature. Fraud occurs, and various schemes are used to detect this fraud afterwards. Corrective action then is instituted to alleviate the consequences. This chapter presents a proactive approach to detection based on artificial intelligence methodology. In particular, we propose the use of data mining and classification rules to determine the existence or non-existence of fraud patterns in the available data.

The chapter begins with an overview of the types of healthcare fraud. Next, there is a brief discussion of issues with the current fraud detection approaches. The chapter then develops information technology based approaches and illustrates how these technologies can

improve current practice. Finally, there is a summary of the major findings and the implications for healthcare practice.

BACKGROUND

Fraud in healthcare transactions refers to knowingly and willfully offering, paying, soliciting, or receiving remuneration to induce business that healthcare programs will reimburse. Healthcare fraud can result from internal corruption, bogus claims, unnecessary health care treatments, and unwarranted solicitation. As in any commercial enterprise, unscrupulous provider or payer employees can misappropriate healthcare payments for personal purposes. Providers can also issue claims for treatments that were never, or only partially, rendered. Corrupt healthcare providers also can induce patients to undergo unnecessary, or even unwanted, treatments so as to inflate charges to the payers. In addition, unethical providers can willfully solicit business from unprincipled, or unsuspecting, patients for the sole purpose of generating billable procedures and treatments.

According to a 1993 survey by the Health Insurance Association of America of private insurers' healthcare fraud investigations, the majority of healthcare fraud activity is associated with diagnosis (43%) and billing services (34%). In Medicare, the most common forms of fraud include billing for services not furnished, misrepresenting the diagnosis to justify payment, falsifying certificates of medical necessity, plans of treatment and medical records to justify payment, and soliciting, offering, or receiving a kickback (Health Care Financing Administration, 1999).

Early cases of healthcare fraud have applied to gross issues such as kickbacks, bribes, and other fairly transparent schemes. Increasingly, however, the Office of the Inspector General has demonstrated a willingness to pursue cases that are in the gray area and courts have tended to interpret antifraud statutes more broadly so as to make criminal prosecution more likely (Steiner, 1993). For instance, waiving a patient's co-payment when billing third-party payers and not disclosing the practice to the insurance carrier has been deemed as fraud and resulted in prosecution (Tomes, 1993).

Fraud has a substantial financial impact on the cost of providing healthcare. Medicaid fraud, alone, costs over \$30 billion each year in the United States (Korcok, 1997). According to CIGNA HealthCare

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