CHAPTER 11

Reporting and Data Mining

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CHAPTER OUTLINE

KEY DEFINITIONS

Business Intelligence—an umbrella term that describes the strategic integration of technology and processes that allow organizations to leverage their data to make better decisions.

Dashboard—common report format used to quickly evaluate the performance of a business process. Dashboards commonly use visuals such as dials, gauges, or stoplights to represent results.

Data Integrity—the accuracy, completeness, consistency, and validity of data.

Data Mining—broad term that encompasses numerous methods used to identify patterns and relationships in data. Examples of data mining techniques include neural networks, rule induction, and genetic algorithms.

Data Warehouse—centralized repository of data from an organization's individual information systems that is organized into integrated subject domains for reporting or data mining. Data warehouses may be implemented with relational or dimensional data models.

Database Query—general term to describe a "search" of a database that returns data for use in reporting or other analyses.

Dimensional Database Model—an approach to designing databases for the purpose of maximizing end-user friendliness and query performance as well as to preserve data history. These features stand in contrast to the strengths of the relational database model (see below).

ePHI—electronically protected health information. Individually identifiable health information stored electronically by healthcare providers.

Fitness for Purpose—a property of data that is appropriate for a given use. In reporting or other data analysis, fitness for purpose is evaluated along dimensions of timeliness and relevancy for the task at hand.

On Line Analytical Processing (OLAP)—a class of applications to support complex queries and analysis across

multiple dimensions. OLAP systems often implement a dimensional data model and are closely related to data warehouses.

On Line Transaction Processing (OLTP)—a class of applications designed to support transaction based operational processes such as order entry or packaging. OLTP systems often rely on databases that implement a relational data model.

Open Database Connectivity (ODBC)—standard interface for accessing modern database systems.

Relational Database Model—an approach to designing databases based on mathematical set theory. Proper application of the model helps ensure data integrity is maintained during transactions that update, add, or remove data.

Reporting—the concise presentation of relevant operational or clinical data for decision making or performance review purposes.

Structured Query Language (SQL)—standard language used to query and manage databases. Pronounced "sequel."

Introduction

Data generated during the provision of patient care continue to migrate away from paper-based formats to electronic methods of storage, usage, and retrieval. While this continued conversion presents its own sets of challenges, the ability to assemble, aggregate, and analyze this data is greatly enhanced. Data and information once locked into paper formats that are difficult to share can quickly be made available to multiple users in different locations and transformed for use in new ways. Electronic data and information can be analyzed, compared, contrasted, trended, and shared faster than ever before. Unlocking our data and information in this manner helps us better understand how healthcare is being provided and our impact on both patient outcomes and institutional operations.

By examining the data through techniques such as reporting and data mining, the pharmacy manager can discover new opportunities to improve services and meet patient needs. These analyses help reduce the use of intuition or guessing in evaluating a pharmacy's performance. Instead, the data can be used to compute accurate and consistent metrics of performance and efficiency. Appropriately applied, the pharmacy manager can use these tools to make objective comparisons and target improvements where they can have the greatest impact.

While the continued conversion of paper-based records to electronic records has many positive benefits, there is also a need for increased control and monitoring of how that data is used. Safeguards must be in place to limit access to the data and information to those with a valid reason to use it and ensure that the use is appropriate. Patients put their trust in healthcare providers to protect their health information and use it effectively. As such, pharmacy managers not only use the data and information but, in many cases serve as stewards of that information to protect patients' trust.

The new flood of electronic data sources available to pharmacy managers present new opportunities but also new challenges that must be addressed. It's critical that the pharmacy manager understand the quality, attributes, and limitations of the data prior to relying on it to make business decisions. In this chapter, we'll explore reporting and data mining and offer practical advice on using them effectively to evaluate departmental performance and improve the care of patients.

Data, Information, and Knowledge

Healthcare systems are very good at producing data. In fact, managers are often drowning in data and have a hard time analyzing it. Data by itself is useless until it is transformed into useful information. The main purpose of reporting and data mining is to turn data into information. Information is data that actually makes a difference. The root of the word is to "inform" or give shape to the data so that it is meaningful when de-