A Flexible WWW Query Interface for a Patient Data Warehouse

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Introduction. In response to pressure for timely information, many health facilities are developing large clinical data warehouses. The patient data warehouse at the University of Virginia has been assembled from several disparate legacy and departmental systems using Sybase RDBMS[1]. To enable hospital personnel to query the data in a timely and independent manner we have constructed an interface that is powerful, intuitive, and easy to use.

Method. The interface uses the World Wide Web (WWW) and consists of a data dictionary, a collection of Common Gateway Interface (CGI) programs implemented using the ‘C’ programming language, and JavaScript-enabled HTML pages. Together, these components facilitate the navigation and retrieval of data from the warehouse (Figure 1). The HTML pages generate SQL automatically in response to point-and-click actions by the user, enabling submission of ad-hoc queries without prior knowledge of SQL. The SQL queries are sent to the CGI programs that query the data warehouse and return results in dynamically created HTML pages. The entire process is controlled by the contents of the data dictionary, which is used to format SQL results, set up HTML links for data “drill-down” and provide online help.

Features. The WWW Interface System described here has several important benefits:

- The warehouse may be queried independently and without knowledge of SQL through a simple point and click interface.
- Advanced users can enter SQL through their network browser.
- Predetermined “canned” reports and simple queries requiring only the selection of a few parameters are easily accommodated.
- Access to the database through this interface is password protected and all data exchanged over the network are encrypted using a secure server.
- Users can immediately “drill-down” and “drill-over” to see further details to explore results.
- Data may be download immediately into Microsoft Excel, or other analysis tool, at the user workstation.
- Online help describing each data element is available from all web pages.

Conclusions. Some benefits of this interface:

- Results are obtained in a timely manner. Users no longer need to wait for data stewards to get to their request.
- Users can engage in data exploration and obtain answers to questions from the desktop whenever their schedule permits.
- The system is Web browser-based with no requirement for installation of special software at the user workstation.

References