2002

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Introduction: The oral & maxillofacial surgical pathology service at The University of Texas Health Science Center at Houston Dental Branch (UTHSC-HDB) is dedicated to the processing and microscopic examination of biopsied specimens from the oral & maxillofacial region. . This service is staffed by 3 pathologists, 2 administrative staff assistants and 2 histotechnicians. Most of the surgical biopsies are submitted by dentists and oral surgeons from the local community and Southeast Texas. In addition to regular paper based record systems, the program stores part of the information on a local database. The database system is used for tracking the diagnostic reports for retrieval of patient materials, and the development of teaching and research resources

The purpose of this project was to evaluate the current information flow, the possibility of integrating the data entry process into it, and the generation of a new database system for this service.

Methods: In order to determine the characteristics of the information exchange inside the oral pathology service, we conducted interviews with the professional and administrative personnel, analyzing the current use of the existing database, paper documents and the sequence of tasks involved in the report of a sample. We were especially concerned with the data entry points and with the forms and procedures used on this university service. A new relational database system was designed based on this diagnostic We used MS Access® to build a database prototype.

Results: The results of this analysis were documented by: an information flow diagram, a list describing the information requirements, the current data capture procedures, as well as a description of the main problems of this system. There were 3 main problems with the system. 1) There was unproductive data entry redundancy, i.e., two staff assistants entered the same data into two different systems. 2) There was ineffective data retrieval. Due to the age of the old database, there were several design problems, mostly in the areas of inability to create specific queries and the low system usability (old DOS based system). 3) The coding systems were ambiguous. ICD-9, AFPI codes, and CPT codes were all used. The system did not offer feedback or references for the coding systems, which were used in the database.

A new database system was designed to solve these problems, as well as integrating billing and sample tracking systems. Additional design goals for the system were that it be user friendly, interactive, intuitive, and flexible to facilitate the formulation of generating personalized queries.

The new database can be used on a network environment, ideally on a closed network to avoid security issues. The system can register different clinical codes depending on the context and user preferences (CPT, ICD-9 or AFPI codes). The system GUI was designed to mimic current paper based formularies, in order to facilitate the learning of the system, shorten the adaptation time and allow for easy assimilation into the present system. The users have tried the updated system and it has been favorably received in both design and information retrieval.

Discussion: The design of databases for dental practice is not a new idea. Since the early nineties, research on the application of these tools to clinical practice[1], research[2] or management[3] is found in the literature. Curiously, after this initial excitement with this technology, there have not been significant efforts to describe the common design issues of these systems. One of the reasons is that a standardized coding system has only recently been implemented, which earlier caused problems in retrieval of information and billing.. Our approach was based on general usability and software design principles and on current trends on health informatics. The use of such tools was effective to solve the problems that we described in the information flow of this service and the flaws in the old database.

Conclusions: The evaluation of the user characteristics, the information flow and requirements of the system was a useful resource to assess the current problems and to improve the existing information system. More research is necessary in order to determine common strategies to solve information processing and flow on dental systems.

References

1. Chasteen J. A computer database approach for dental practice. J Am Dent Assoc 1992;123(9):26-33.
2. Webster DA, Smales RJ. Large database management in clinical dental research. Aust Dent J 1991;36(5):397-400.
3. Gilboe DB, Scott DA. Computer systems for dental practice management. A new generation of independent dental software. J Can Dent Assoc 1991;57(10):782-6.