What is dental informatics?

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Dental informatics

“Dental informatics is the application of computer and information science to improve dental practice, research, education and management.”


Information science

… is the collection, classification, storage, retrieval, and dissemination of recorded knowledge treated both as a pure and as an applied science.

Sample research questions:
• Is SNODENT an accurate representation of dental diagnoses?
• How can a patient’s oral health status be summarized from comprehensive data about oral health and general health?

Computer science

… is a discipline that involves the understanding and design of computers and computational processes.

Sample research questions:
• How can various pathologies on radiographs be detected using neural networks?
• How can decision support systems help dentists develop optimal treatment plans?

Cognitive science

… is a science that draws on several fields (as psychology, artificial intelligence, linguistics, and philosophy) to develop theories of perception, thinking and learning.

Sample research questions:
• How should computer-based dental charting systems be designed for optimal user performance?
• How can detection of early-stage oral cancer by dentists be improved?
Telecommunications

... is the science that deals with communication at a distance.

Sample research questions:
• How can a complete and comprehensive oral health record for a patient be assembled on the fly using electronic records from different providers?
• What communication requirements do real-time, comprehensive teledentistry systems have?

The biomedical informatics realm

Sample research projects in dental informatics

Clinical practice
Computer expert system for the histopathologic diagnosis of salivary gland neoplasms

Research questions:
• How does the diagnostic performance of the expert system compare to the diagnostic performance of human experts?
• What types of inference mechanisms are particularly well-suited to diagnosing salivary gland neoplasms?

Clinical practice
Usability of four practice management systems

Research questions:
• Which usability problems are common in dental software?
• What is the rate of completed, incorrectly completed and incomplete user tasks?
Where is the science in biomedical informatics?

The tower of science in informatics

- **Study of Effects**
  - studying the effects of these systems on the reasoning and behavior of health care providers, organization(s) and process(es)

- **System Installation**
  - installing such systems and then making them work reliably in real-world environments

- **System Development**
  - developing innovative computer-based systems that deliver information or knowledge to end users

- **Model Formulation**
  - models for acquisition, representation, processing, display or transmission of biomedical information or knowledge

Friedman C. Where is the science in medical informatics? JAMIA Feb 1995. Vol. 2 No. 1; 65-67

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