Digital data comes with additional decision-making power

BY MEGAN STEPHENS

Imagine knowing how many implant procedures or restorations lasted over 10 years. Or accumulating the best practices to prevent tooth loss after a periodontal procedure. What would it be like to share this information, collected from digital records, with your patients to promote shared decision making?

IU School of Dentistry and Regenstrief Institute have joined together to establish a dental informatics program to harness the power of the digital personal health record (PHR) in dentistry. The new program is one of only a few in the United States, and perhaps the only dental informatics program in the country, linked to a clinical data repository managed by a regional health information exchange.

Positioned at the intersection of dentistry and medicine, the Regenstrief-IUSD dental informatics initiative has two end goals. First, link digital dental and medical records together to develop a database exchange that will advance the knowledge base of oral health problems that cause, co-occur with, or result from other medical conditions. Second, translate and implement these findings into dental offices and other points of care to enhance oral disease prevention and treatment while making patient care more efficient.

"When we look at unmet health needs, oral health is one of the most significant," said Dean Carol Anne Murdoch-Kinch, DDS, PhD. "With this new partnership between the dental school and the Regenstrief Institute, we will be well-positioned to use the growing amount of data being collected by dentists and researchers to advance oral health and overall health for individuals everywhere."

The limited availability of high-quality, short-term and long-term evidence on dental treatment outcomes is a well-known challenge. However, over the past two decades, as PHRs have been digitized, nearly 80 percent of practitioners are using digital PHR. Dental informatics aggregates and analyzes this PHR data, which allows practitioners to monitor treatment outcomes to promote better patient care, said Thankam Thyvalitakath, DMD, PhD, IUSD associate professor and Regenstrief Institute research scientist and leader of the collaborative dental informatics initiative.

For example, learning from real-world patient data, practitioners can see how well they are doing, such as analyzing how many root canal teeth are failing over five years.

"With digital data, practitioners can look at the big picture to improve the details in their practices," Dr. Thyvalitakath said. "While medicine has a long history of applying informatics approaches for research and patient care, in dentistry, clinical informatics is still in its infancy. With increased use of electronic dental record data for research and developing informatics interventions for patient care,

that gap can be narrowed. Closing the circle between data acquisition and data use at the point of care through electronic medical records will improve clinical practice and outcomes as well as reduce the burden on patients of repeatedly reporting their medical history."

Dr. Thyvalitakath's prior research, funded by the National Institute of Dental and Craniofacial Research (NIDCR) for the National Dental Practice-Based Research Network, established a repository of data from 99 private dental practices in the United States that, for the first time, demonstrated the feasibility of using electronic dental record data from private practices for clinical research and quality improvement purposes.

Dr. Thankam Thyvalitakath, IUSD associate professor and dental informatics leader at Regenstrief Institute

"The IU School of Dentistry and Regenstrief partnership will help promote information exchange and care coordination among dental and health providers and offer a vital model for accessing regional health exchange data to promote better overall health," Dr. Thyvalikakath said.

The regional databank that Regenstreif manages is the nation's largest inter-organizational clinical data repository, with more than 12 billion data elements about patients in Indiana and beyond, including the dental school and dental practices across the country.

"Dental informatics is an important, growing discipline that is poised to deliver even greater impact to people and populations," said Peter Embí, M.D., president and chief executive officer of the Regenstrief Institute. "Leveraging the unique combined expertise of Regenstrief Institute and IU School of Dentistry, and making use of the robust research data repositories that we manage, our new joint program will lead to improvements in diagnosis, prevention, and treatment across a range of diseases, ultimately improving medical and dental practice, individual well-being, and population health."