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MORE ABOUT ONTOLOGY

I read with interest Dr. Barry Smith and colleagues' October JADA editorial, "Ontology and the Future of Dental Research Informatics" (Smith B, Goldberg LJ, Ruttenberg A, Glick M. JADA 2010;141[10]:173-175). It was fascinating, reassuring, surprising and a little disappointing all at the same time.

The terms were fascinating: genomic, proteomic, salivaomics, metabalomics and transcriptomics. Research scientists working together with cross-discipline expertise is cutting edge. I was reassured to learn that our profession's research base will be on the same level with connected peer groups.

I was surprised to hear that the dental scientific community is fragmented and disconnected ontologically. Clearly those in charge of this Ontology for Dental Research (ODR) effort are making a serious attempt to rectify the deficiency. Creating a common lexicon to integrate past, present and future data will be a notable achievement that will advance dental research.

While electronic dental records were mentioned in the second sentence, I was disappointed that no further mention was made. Without incorporating ODR into electronic dental records, the sharing of data from clinicians will not be possible. Data from the clinician can be an essential part of research. But embedding and employing ODR in computer-based dental records is imperative to truly involve the practicing dentist. Electronic dental records that can process data should be available for researchers and clinicians

working in partnership.

In their defense, however, maybe the authors know already that electronic dental records prevalent in the market will be of no help, as the informatics literature proves. Unfortunately, electronic records lack common standards that allow for effective data sharing with researchers. Related critical data that would be useful are missing from electronic dental records.

Can this be changed? I think it could. The American Dental Association (ADA) can exert beneficial influence over evolving electronic dental records. The ADA already provides some guidelines for electronic dental records. More significantly, the ADA also charges vendors who use the ADA codes 10 percent of the vendor's gross receipts for the right to use the codes. I suggest the ADA could contribute to the developing ODR financially and through policy development.

And so in that spirit let me ask, what if the ADA deferred the 10 percent fee for companies that complied with ODR standards within their records? Or else reserved the money to pay dentists to help them adopt ODR-compliant electronic dental records? A growing number of dentists could embrace participation in the larger arena of health care rather than functioning in isolation. And one has to ask, in light of the developing ODR, what will happen to the Dental Practice-Based Research Networks if clinicians must continue to engage in a double entry noncompliant task for creating data?

Dentists, informatics specialists and researchers should make recommendations for bringing electronic dental records into the 21st century. Let's have electronic records

that not only enable business practices but also make for better doctoring and move our profession to the medical forefront, ready to interact with the National Institutes of Health and similar organizations. Nineteen billion dollars of stimulus for health information technology in the United States, so far, has done little for dentistry.

ODR-compliant electronic dental records that can provide meaningful use in research would do a lot. Here is an opportunity.

I appreciate the work of the authors and hope they will consider seeking a way to draw the practicing clinician into the mix.

Tom Cockerell Jr., DDS
Fort Worth, Texas

Authors' response: Dr. Schleyer and his group are responsible for some of the most important contributions to dental informatics, and we are thus honored by the strong support expressed in their letter for the idea of an Ontology for Dental Research (ODR). We welcome his letter also because it gives us the opportunity to specify more precisely our thinking as it concerns the criteria for membership in the ODR consortium.

As in the case of the Open Biological and Biomedical Ontologies (OBO) Foundry ("http://obofoundry.org"), which serves as the model for the ODR initiative, the intention is that all the leading stakeholders in the relevant field will participate in this consortium, subject only to the requirement that they commit to addressing the tasks involved in building, maintaining and applying ontology resources in a collaborative fashion, so that the results of our efforts can be used in tandem with each other. This

means, for example, seeking to minimize redundancy and inconsistency between different resources, and it means also addressing the goal of what is called "semantic interoperability" by ensuring that the same terms are always used to refer to the same types of entities in reality. Our experience with the OBO Foundry has been that potential developers and peer reviewers are able to be incentivized to contribute to such an effort by the fact that they thereby come to enjoy coownership in and influence over the result.

We are grateful also for the support expressed by Dr. Cockerell, and we hasten to reassure him that, while electronic dental records were indeed mentioned only in passing in our editorial, they will, of course, play a central role in our efforts in the future. As he points out, unless some way is found to incorporate into electronic dental records some resource that is, like the proposed ODR, built in concord with the terminologies used to describe clinical and biological data, then the sharing of data from clinicians will be impossible.

Recently, the ontologists at the University at Buffalo initiated a collaboration with the developers of the Picasso dental record system created to support the management of patient data in the University at Buffalo School of Dental Medicine. We see this collaboration as a means to test strategies for incorporating ontology and Semantic Web technology into an electronic dental record system with the goal of creating a virtual laboratory for incorporating biological data and clinical and dental patient data for purposes of research. As the ODR consortium develops, we also hope to incorporate in these experiments the contribu-

tions from Dr. Schleyer's laboratory and from other interested groups.

To achieve an outcome of the sort envisaged by Dr. Cockerell, however, it is not only technical problems that need to be solved. We will need to confront also a range of social, educational, legal, economic and political issues. Above all, the major clinical electronic health record systems are proprietary; they are often based on out-of-date and needlessly expensive approaches to the management of data; and they incorporate ontologies, if at all, only in secret, thus denying to the health care institutions that use them the benefits of collaborative development of the sort provided in the biological sphere by the OBO Foundry.

We are strongly optimistic that something better can be achieved in the field of oral medicine and oral biology. Precisely because critical diagnostic and other data are missing from existing electronic dental records, we have an important opportunity, which we should grasp with all means at our disposal. In this respect, it is remarkable that since the publication of our editorial, two sessions on the topic of ontology have been scheduled at the San Diego meeting of the International Association for Dental Research in March 2011. One of these sessions is focused on the ODR, and all those interested in the matters addressed above are warmly invited to attend.

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