Columbia Center for New Media Teaching and Learning *Seminar #683*
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Chairs: Ryan Kelsey and Frank Moretti
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Transforming Dental Practice with New Media

Speakers:
Dr. David Albert, DDS MPH, associate professor of clinical dentistry section of social and behavioral sciences; Dr. Burton Edelstein DDS MPH, Professor of Clinical Dentistry and Clinical Health Policy and Management; Jessica Rowe, senior program specialist for CCNMTL's Triangle Initiative; Cindy Smalletz, CCNMTL educational technologist

Two recently developed educational new media projects developed in partnership by the Columbia Center for New Media (CCNMTL) and the Columbia Dental School were presented at this seminar. Dr. David Albert and Cindy Smalletz began by introducing the project, Tobacco Cessation, which was created to teach dental students about tobacco cessation assessment and treatment. They were followed by Dr. Burton Edelstein and Jessica Rowe, who jointly presented MySmileBuddy, a mobile application designed to help community health workers assess risk and educate families about early childhood caries (tooth decay).

Dr. Albert began the seminar by providing background information about the tobacco cessation multimedia tool they have developed to help prepare dental students to effectively address patients who smoke. He explained that at the Columbia Dental School students are required to attend a three-hour seminar on smoking cessation, but that the Dental School was finding a disconnect between the information supplied in the seminar and what was actually taking place when students met with patients. Traditional dental education usually involves classroom education, followed by clinical observation and, finally, supervised clinical service. But when it came to addressing smoking cessation with patients, the CU dental school appeared to be skipping the second two steps altogether; the challenge was to create a multimedia educational resource that would bridge the gap between the classroom learning and the actual interaction with patients.

Since they hoped to develop a tool that would be of use to other dental schools as well, Dr. Albert and his team conducted a survey of 56 dental schools around the country. Their results indicated that a variety of approaches are used to introduce dental students to smoking cessation treatments. Dr. Albert explained that in most schools the clinical effects of tobacco were often taught in pathology or periodontics, but that less attention was paid to teaching dental students how to help people quit. The topic was most commonly addressed in all-class lectures, and actual clinical training was rare. Dr. Albert noted that the survey confirmed widespread need for new techniques that could prepare

students to speak about smoking cessation, prescribe smoking cessation treatment, and confront issues of smoking cessation in a practical manner.

Next, CCNMTL educational technologist Cindy Smalletz explained that Phase I of the Tobacco Cessation project, completed in 2009, involved the creation of a digital tool designed to facilitate dental students' knowledge of successful tobacco cessation treatment. This phase was focused specifically on teaching students how to prescribe pharmacotherapeutic treatments. Future work on the project, Cindy explained, will expand the tool to include all parts of the tobacco cessation conversation that takes place (or should take place) between dentists and patients, from the pre-exam discussion in which the dentist asks whether the patient smokes, through the post-exam conversation in which the dentist advises cessation, assesses the patient's commitment to quitting, and hopefully assists him in his effort by prescribing treatment.

Cindy then demonstrated the Tobacco Cessation website that is currently being used by Columbia dental students. The site includes various resources and multimedia modules including videos, virtual patients, interactive lessons, and quizzes. She explained that dental students have little experience filling out prescriptions for long-term treatment, so the tool addresses this: students have the opportunity to practice filling out prescriptions for the seven treatments most often prescribed. Students review the material on the Tobacco Cessation site independently, then attend a seminar and participate in group projects in which they discuss how to interact with the virtual patients. Students, for instance discuss what the best and worst choices of medication are for various types of patients.

The next version of Tobacco Cessation will include practice interactions with virtual patients in which students will rehearse not just prescribing medication, but also asking the patient about their smoking habits and discussing their needs. The student will choose from several options of what to say to the patient, and based on their choices different video responses will appear.

Dr. Albert concluded their presentation by explaining that the overall goal of the project was to better prepare students to have the smoking cessation conversation with their patients, which past pedagogical strategies did poorly. Next steps for this project included completing phase 2 of development and testing Tobacco Cessation with pre-docs and post-doc periodontal students.

Dr. Edelstein presented next, introducing the mobile application, MySmileBuddy, developed by CCNMTL and Dr. Edelstein to help community health workers address ECC, or early childhood caries (tooth decay). He began by explaining that the project was funded by the National Center of Minority Health Disparities, and the project's official title is "Biobehavioral Chronic Disease Management by Families of Young Minority Children." The title and the funding source underscore their belief that they are developing a tool that could have applications beyond dentistry. In fact, as it is currently designed—as a tool of early detection, risk assessment, and prevention—it is intended to help circumvent dentists as much as possible.

Dr. Edelstein explained that there is a huge gap between the information supplied by health providers and actual changes in daily behavior that are necessary for wellness, and this is especially true with chronic conditions. ECC is essentially any tooth decay in children under the age of six. It is an infectious, diet dependent disease, which can be moderated by fluoride. But when left untreated it can leave children susceptible to tooth decay for life. He went on to note that ECC is both common, affecting 11% of one-year-olds and 44% of four-year-olds, and consequential: it can cause pain, infection, and ultimately, distraction and dysfunction in young children.

We generally rely on surgical repair to treat ECC, but it falls short for a number of reasons. It is expensive and high stress to the child, often requiring painful procedures and general anesthesia. But most importantly, it doesn't stop the disease: recurrence rates of new cavities within two years of surgical treatment are 40-60%. Dr. Edelstein explained that to really combat the problem, instead of giving families of young children a lot of unguided advice, we need to focus on developing evidence-based, risk-tailored action plans that will engage the whole family.

With this in mind, Dr. Edelstein's team developed a straight-forward multi-stage flow chart that moved neatly from risk assessment to family education and so forth. But after meeting with community health workers they found their plan had some problems they had not anticipated.First of all, health workers did not think that ECC was a problem: for one thing, it appeared to be treatable surgically and, after all, these were baby teethe that were going to fall out anyway. Clearly this lack of education among health workers needed addressing. What is more, health workers did not see risk assessment and family engagement as being separate stages; after all, risk had to be assessed based on family practices and eating habits. And finally, there were some things community health workers simply did not feel comfortable doing—like looking into children's mouths.

So the team had to refine its approach as it developed, pilot tested, and refined the interactive electronic tool. Eventually they developed a mobile application called MySmileBuddy, which assesses risk, helps define goals and action for behavior change, and educates both health workers and families about ECC.

CCNMTL's Jessica Rowe stepped in to demonstrate the tool. She explained that it will be used on an iPad, which has the appeal of being mobile enough to be taken into homes, with a large enough screen that multiple family members could gather around it at once. They want to create a tool that can be used in a variety of contexts, so the application is entirely downloadable to the iPad and can be used even in areas without wireless service.

The assessment tool has multiple screens that prompt the health worker to ask questions, especially about diet, that ascertain whether a child is at-risk. A chart with photos of common foods functions as a memory aid to help parents recall what their child ate the day before. By clicking on the pictures, the parent and health worker construct a chart of the child's daily diet. On the back end, the tool is simultaneously assessing how risky that diet is. The calculus also gives different questions different weights based on what we know about how much they increase risk. Essentially the application is a support tool for

the health workers, to help them know what questions to ask (each question also has a help screen that explains the question and why they are asking it), but also to collect data. The tool also produces printable information sheets for families to keep, as well as several videos about, for example, nutrition and how to brush your child's teeth. After the questions are answered, the child is given a risk number, and a number of possible goals and plans of action are presented for parents to choose from.

Dr. Edelstein concluded the presentation by pointing out that the system is designed to help parents set their own goals and decide their own action steps in order to effectively encourage behavior change.

Discussion

Briana Ferrigno, CCNMTL Communications and Marketing Manager, opened the discussion by asking how health workers would be trained to use the MySmileBuddy application, and who those workers would be. Jessica Rowe responded that they are doing a pilot project with Head Start, and that the research team would be training the workers in-person. They hope the tool will ultimately require very little training to use. Dr. Edelstein interjected that their initial grant was to develop a tool, not to also evaluate it. However, they have several potential funding sources for a formal evaluation, including possibly working with partners at other institutions, or a doctoral student conducting the evaluation as his or her dissertation research.

CCNMTL Associate Director of Services Dan Beeby noted that Dr. Edelstein's team seemed to have created a virtual solution to the problem that community workers do not feel comfortable actually looking into children's mouths—was the tool actually a complete substitute for this exam? Dr. Edelstein responded that there was further risk assessment info that could still be gained by looking into the child's mouth, and that if a dental clinician is using MySmileBuddy, different questions pop up.

Jonah Bossewitch, CCNMTL Lead Technical Architect, said that he was especially curious about the relationship between behavioral change and what people already know; for example, everyone already seems to know that tobacco use is bad for you, yet people often don't change their behavior. Was there any way to use the MySmileBuddy tool to determine what people already know about tooth decay? Jessica Rowe responded that there were some questions in the assessment that get at that larger issue, and she reiterated that one of their main findings in their early discussions with health workers was that they do not realize that ECC is a problem.

Here Dr. Albert jumped in to point out that while tobacco use's relationship to lung cancer and other respiratory diseases is well-known, its effects on the oral cavity are not common knowledge. That is why his team is so concerned with educating dentists about this. He noted that the grisly images of tobacco's effects on the oral cavity are one reason why dentists can play a key role in tobacco cessation: they can show patients what will happen to their mouths if they continue to smoke.

Seminar co-chair Ryan Kelsey observed that the day's presentations gave a broad sense of what dentistry is—broader than what is commonly understood. Might CCNMTL play a role in helping those at the dental school to broaden public thinking about the field? Dr. Edelstein replied that the field of dentistry is splitting into factions: there are those who prefer a very narrow specialization, and others who take a broader, more interdisciplinary view of the field. Since the Columbia Dental School tends to be a research-heavy institution, they tend to fall into the latter camp, advocating for partnerships across medical and other disciplines, such as social work. There is a growing understanding in all medical fields that social determinants are as important as physiological ones. Dr. Albert agreed. He added that their tobacco cessation tool involved five videos that they did not show in their presentation, but that the expertise at CCNMTL had been indispensable in their creation.

Seminar Co-chair Ryan Kelsey thanked the presenters and invited attendees to the next CCNMTL University Seminar, scheduled for early February.