Oral Health Monitor for Children

NSF PFI: 1631146, Partnerships for Innovation: Building Innovation Capacity (PFI:BIC) program with a focus on Smart Service Systems

Eric J. Seibel, PhD - University of Washington, Seattle, WA

The dental service model is antiquated and not meeting the needs of millions of Americans. The greatest disparity is travel distance or expense from a dentist, as shown in Alaska Native Tribal Health Consortium studies, where there is 2.5x prevalence of caries (tooth decay) compared to the same aged children in the USA. With the advent of topical medicinal therapies, mini-optical sensors and mobile computing, we are taking on the challenge of testing three new concepts of managing oral health outside a dentist office in cooperation with the local community dental health aid and managing dentist.

- Screening: optical imaging plaque loading that accumulates on teeth for quantitative feedback
- Therapy Monitoring: fluorescence spectral analysis to measure the process of healing enamel
- Caries Prediction: ranking the activity of the plaque deposits to locate sites for active prevention

Major challenge is the interface design in providing a high level of engagement and understanding from these three activities without a high burden for the various users (child, parent, local/distant caregivers). These pilot studies of delivering oral health services can be extended to gum disease for adult users and internationally for all users, such as China, India, and Mexico where there are 6x fewer dentists per capita than USA.