



## Transforming Electronic Health Record Systems in Dentistry

Introducing the first, fully cloud-based offering exclusively for dental schools

### THE PROJECT

Improvements in healthcare require collaborative and multi-disciplinary approaches to complex questions. That is why researchers and educators at the dental schools of the Universities of Michigan, Pittsburgh and North Carolina teamed up to move the care provided for their dental patients away from siloed, client-server electronic health record (EHR) systems in which data is isolated and difficult to access for healthcare research and student learning.

To accomplish this, the universities worked with Internet2 and ICE Health Systems (ICE) to form the Collaboration for Health IT, <https://collaboration4hit.org>. This multi year-long endeavor drew upon lessons of successful team management to assist ICE in building a custom technology platform that can advance education, health and research.

Working with a program manager to help remove inter-institutional barriers by guiding and supporting effective collaboration practices, strategies adopted include: a flat governance structure that defines working and decision-making methods; Working Groups with clear goals, metrics of success and timelines; a communications infrastructure that supports geographically dispersed collaborators; and regular face-to-face working sessions. The program manager also supplied essential services and standards that all the schools adopted: legal, authentication, security, among others.

The result of the Collaboration is the first, fully cloud-based offering that aims to support learning and research in dental science by providing an efficient clinical experience for both faculty and students, dynamic access to patient data, and enhanced collaboration and communication among dental practitioners. The University of Michigan has committed to be the first dental school to implement ICE in 2018.

**“THIS WILL TOUCH EVERY PATIENT, EVERY STUDENT, EVERY FACULTY MEMBER WHO WORKS WITH STUDENTS IN CLINICS, OR SEES PATIENTS. IT WILL TOUCH ALL THE STAFF THAT HAVE ANYTHING TO DO WITH PATIENT CARE. AND FUTURE RESEARCH WILL BENEFIT AS WELL,” SHE SAID. “IT WAS TIME FOR A MAJOR STEP FORWARD IN TECHNOLOGY AND THIS IS IT.”**

LYNN JOHNSON, PhD, *Professor of Dentistry, School of Dentistry, Associate Dean for Faculty Affairs and Institutional Effectiveness, Clinical Professor, School of Information The University of Michigan*

### SOLUTION SUMMARY

Clinical educators, dental researchers and school administrators at the Universities of Michigan, North Carolina & Pittsburgh realized that their current electronic health record system does not support their mission of being a leader in education, research and clinical care. By leveraging Internet2’s NET+ process, collaborators from all three universities selected ICE Health Systems (ICE) to develop a truly unique cloud-based offering that meets the complex needs of dental education environments while supporting multi institutional research collaborations. Through the peer-driven validation process, these universities established a legal, security and technology infrastructure framework that allows them to adopt a custom-built commercial cloud solution for their shared research and education needs.

This multi year-long effort, known as the Collaboration for Health IT (Collaboration), established a model for how universities can work together with a provider to plan and deliver an entirely new way of supporting dental programs, which often have complex business, legal and security requirements. The Collaboration did not only provide a significant research and education offering for dental education, but has also set in motion a roadmap that will continue to transform how health information technology and dental practice will evolve over the coming decades.

### COLLABORATORS

- **University of Michigan**  
[www.dent.umich.edu](http://www.dent.umich.edu)
- **University of Pittsburgh**  
[www.dental.pitt.edu](http://www.dental.pitt.edu)
- **University of North Carolina**  
[www.dentistry.unc.edu](http://www.dentistry.unc.edu)

### PRODUCTS & SERVICES

- **Internet2 NET+ ICE**  
[www.internet2.edu/products-services/cloud-services-applications/ice-health-systems/](http://www.internet2.edu/products-services/cloud-services-applications/ice-health-systems/)

### COMMUNITY RESOURCES

- **Internet2 NET+ Services**  
[www.internet2.edu/cloud-services](http://www.internet2.edu/cloud-services)

## THE PROBLEM

Clinical educators and dental researchers are aligned in the health record challenges facing them. Most notable among these challenges are:

- Reliance on old technology that is unable to meet current needs and regulations
- Unsatisfactory data pools, including difficult and expensive access of data
- Cost structure that lacks transparency and is overly burdensome
- Lack of opportunity for the professional community to govern the process and product they rely on so heavily
- Interoperability is too expensive, difficult and slow

## THE SOLUTION

To develop the next generation health record system, the Collaboration spent more than one year defining and documenting a recommended standard of security and compliance for the dental profession that places importance on protecting health information. An important part of the development was an extensive security review to ensure the privacy of patient information.

To ensure the success of this project, all members of the Collaboration agreed on conducting annual, external security audits to continually improve security measures. The audits began in November 2015 and were completed by the information security team at the University of Michigan's School of Dentistry. ICE is also actively working toward ISO 27001 certification.



Universities are now able to integrate the ICE system with campus hospital EHRs and voice input devices, as well as share their implementation successes and failures. The ICE cloud-based offering does not only address the present needs of the dental education community, the continued commitment by the Collaboration ensures that the system has the capacity to evolve with future technology needs.

Leveraging Internet2's NET+ framework, the Collaboration members worked with ICE on a transparent pricing model that is tailored to the higher education community. The terms and conditions reflected in the legal agreement is available to all dental schools in the U.S. and covers all aspects of a cloud services agreement, in addition to the careful consideration and inclusion of HIPAA requirements.



## THE RESULT

**Adoption by the Campus Community:** the dental schools of the Universities of Michigan, Pittsburgh and North Carolina helped to create a custom, cloud-based electronic health record system for the dental education community. It is anticipated that 2 more universities will join as early adopters of the ICE EHR by July 2017 and continued interest in ICE by others in dental education and private practice is growing.

**Integration/Interoperability:** the Collaboration's governance model helped ensure that the ICE EHR is highly interoperable. Integrations with hospital EMRs are currently underway and integrations with supporting products such as drug databases, medical information support systems and Google glass have proven successful, cost-effective and quick to implement.

**Community Building:** the Collaboration meets in person a couple of times a year, rotating between the member universities and the ICE office. At these meetings, the dental education community shares success stories as well as challenges that ICE then works on addressing, thus creating a community of best-practice in dental education. The Collaboration also sets the annual development priorities during these meetings, as well as planning visits to each other's campus to assist with implementation efforts