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A Vision for How Technology will Change the Work of the HSC by the Year 2020

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Introduction

On June 29, 2010, the HSC Executive Leadership Council participated in a 3-hour retreat to envision how technology will change the way we work at the HSC across all mission areas by the year 2020. The purpose of the retreat, a goal for CY10, was to give the Council a dedicated opportunity to talk about technology outside of the HSC's regular strategic planning process.

HSC Executive Council members were given 9 readings prior to the retreat, highlighting forecasted changes to education, biomedical research, healthcare delivery, and how we will work in general based on changes in technology. The retreat began with a keynote address from C. Martin Harris, MD, MBA, Chief Information Officer for the Cleveland Clinic. Then 7 members of the Council each gave a 5-minute informal talk about what technologies they thought they would need in their respective areas 10 years from now. At the end of the retreat, Council members came up with 26 predictions for how technology will change the way we work at the HSC by the year 2020. These predictions were incorporated into a Delphi survey, which was sent to the HSC Executive Leadership Council and senior education, research and clinical leadership throughout the HSC (43 total). In the survey, respondents were asked how likely these predictions were to come true by 2020. Respondents could also rewrite a prediction to more closely match what they thought would be in place by 2020. This group engaged in 2 consecutive rounds of Delphi surveys to refine the predictions from the retreat.

The narrative below is an attempt to inter-relate this list of predictions and provide some context so they will be more readily understood. The fundamental assumption in integrating the predictions is that many of them relate to changes brought about by the health care reform legislation of 2010 as well as changes to the HSC with the addition of the UNM Sandoval Regional Health Center and related restructuring to transform the HSC into a health system. Another assumption is that many of the predictions relate to achieving the HSC's 2020 Vision. As a result, this vision is heavily weighted toward the HSC's technology infrastructure and the clinical enterprise, with fewer education or research-specific technological changes. Future refinements to this vision should more fully incorporate education and research.

A Vision for Technology at the HSC by the Year 2020

By the year 2020, the underlying technology infrastructure at the HSC will have changed, becoming more stable, secure and flexible to meet the more complex needs of the institution. Awareness of the impact of technology disasters and ensuing resolution of many of the data security problems of today will result in technologies that are more resilient and redundant, resulting in accessible, secure and confidential information systems with less technical management. Enterprise systems (e.g., health record, financial systems, communication tools, etc.) will have evolved to the point where they are easier to use and maintain and facilitate customization for individuals and departments to some degree to meet their specialized needs.

These systems will also incorporate, to varying degrees, interactive interfaces such as voice and gesture recognition as well as biometric security.

Though funding will continue to be a significant challenge, over the next 10 years, technologies at the HSC will be implemented to support a larger, more diverse campus that is more spread out to accommodate the HSC's evolution to a health system. This will include the adoption of technologies like unified social networking and easier methods for data sharing and remote access to facilitate more interpersonal interaction at a distance. Core administrative functions like training, both synchronous and asynchronous, will evolve to better utilize robust distance learning technologies that cater to the use of mobile, portable devices. Additionally, while technology standards and services will continue to become more centrally managed and unified to support greater integration, the staffing support for these services will be more decentralized to provide customized, on-site assistance in situations where remote assistance is less effective.

With these technological advancements, the integration of large information systems to meet the HSC's evolving needs for customized data can begin to happen, including data to demonstrate Meaningful Use. By 2020, the UNM Health System will have electronic health information systems in place with selected community practice clinic sites and hospitals. At the HSC, large databases across the mission areas will be integrated, with data organized into meaningful information. Moreover, integrated data-mining to facilitate the sharing of data will be possible, through the use of algorithms and robust standardization. The HSC's needs for fiscal, scheduling, and lab databases for research and quality analysis will drive data-mining development, and some information will be available on populations regardless of where they are medically managed. Additionally, members of the health care team will access this data using a variety of devices, many of their own choosing, from numerous locations within and from outside the UNM Health System.

For a variety of reasons, including rural access to care and health care reform to name a few, the nature of patient care in the UNM Health System will have also changed by 2020. Technological and scientific advancements will have led to considerable growth in laboratory and radiology diagnostic capabilities, including increased use of robotics and diagnostics that advance the structural and functional analysis of patients. Patients of the UNM Health System will have electronic access to their health information in order to promote patient inclusion on health care team, and this will be seamlessly integrated into the electronic health record system. Because of the importance of including the patient as part of the health care team as a norm in the practice of medicine in 2020, the majority of New Mexico's patients will use their personal electronic health record at some level.

To adequately meet the need for health care in New Mexico, teleheath will experience considerable growth over the next 10 years. By 2020, teleheath will be integrated into the clinical enterprise at the HSC, and this type of virtual patient care will become more a part of regular clinical practice. To meet patient preferences, the UNM Health System will have clear reasons for choosing virtual versus physical interactions with patients, and will continue to

evolve its care model to meet the opportunities and challenges created by this change, facilitating more continuous care opportunities.

These changes to the HSC's IT infrastructure and the clinical enterprise over the next 10 years as well as competition for students will have a significant impact on the HSC's education of future health care workers. Students will have significant and meaningful exposure to telehealth and other forms of virtual patient care because of the considerable growth in the use of it in New Mexico. Simulation will be highly encouraged and become a part of regular practice in classroom learning and assessment, and there will be well defined roles for the use of simulated virtual and physical patient educational interactions across all programs. To more closely emulate the clinical care environment, HSC education programs will also evolve to include experiences with patients being a part of the interdisciplinary health care team using their electronic personal health records in both virtual and physical patient educational interactions and in assessment.

Over the next 10 years, competition for students and the elimination of distance barriers will propel the implementation of new educational technologies. Learning experiences will adapt to evolving student learning styles by becoming more decentralized and will utilize robust distance learning technologies that take advantage of mobile, portable devices for both synchronous and asynchronous learning. The use of electronic literature, visual and auditory modes of obtaining information will also continue to increase, and unanticipated and anticipated adaptive modes of learning and communication will be observed and addressed in the curricula. To accommodate these pedagogical changes, the HSC's culturally competent workforce of 2020 will have evolved to respond to the needs of the educational mission, continuing to incorporate new and emerging technologies into the curricula. Moreover, faced with these changes and the continuing escalation of subscription costs from publishers, the HSC will find new opportunities to develop and participate in additional regional library networks in order to manage collection costs.

Building on the strength of its individual faculty researchers and the types of biomedical research they engage in, significant growth in multi-institutional, team-based research, will also guide the HSC's IT infrastructure over the next 10 years. Investigators will utilize robust tools to build and maintain research profiles, which are searchable and increase opportunities to build the diverse research teams needed to take advantage of larger extramural funding opportunities. They will utilize many of the changes to IT in the clinical enterprise and increasingly demand customized tools. Faculty will make use of ready access to databases (e.g. fiscal, visits, labs), improved, customizable interfaces, and integrated data-mining to generate knowledge from the vast data resources available. UNM faculty research will also advance with the availability of some information for populations, as well as preliminary models of the social determinates of health and disease. Globally, advances in technology by the year 2020 will also allow scientists to better understand questions such as the structure-function implications of genetic heterogeneity, leading to new scientific advances and discoveries by UNM investigators. Taken together, these changes will further grow the output of UNM investigators in the area of biomedical research, increasing the UNM HSC's regional reputation for excellence in research, with some areas becoming known nationally.