Top Technology Issues Facing Academic Medical Centers

♦ **Web Enablement:** Academic medical centers continue to struggle with appropriate use of the web both inside and outside their institutions. Web technology is very suited to the distributed nature of these institutions, yet corporate interests often fight to reign in this electronic entrepreneurship in the name of website coherence and control of content. The challenges are to keep website content fresh, unified, and appropriate as the marketplace's standard for visual presentation continues to get more and more sophisticated. While academic medical centers are not compelled to comply with American with Disabilities Act presentation standards, this will become increasingly important as their websites attempt to appeal to wider audiences for marketing and educational purposes. Developing an effective e-business strategy also continues to be an active topic for these organizations.

♦ **Funding:** Technology competes for funding with many other capital and operational priorities. As the technology sector of the economy weakens, these corporate sponsors will likely become less reliable for significant donations or partnerships. As expansion continues for some, technology is often squeezed out of the building plan in an attempt to streamline or reduce the budget.

♦ **Information Security:** In an Internet-enabled world, information security is a growing challenge. Academic medical centers use their infrastructure simultaneously for education, research, and clinical care, yet the rules that govern use of information for these activities are often quite distinct. The Health Insurance Portability and Accountability Act (HIPAA) has crystallized the focus of information security efforts by requiring a new level of compliance and documentation than had previously been required. Most institutions have not even completed assessing their compliance requirements let alone implemented full programs.

♦ **Research:** Technology support for research is hampered by project/grant-based funding that does little to promote resource sharing or leverage. Faculty members are often ill prepared to manage research data with the same industry standards of practice as administrative systems (for example, data and database administration are practically non-existent in research settings). Research data - often about the same individuals - is usually fragmented. In most cases, the tools and training for data access/query and data mining are inadequate. Finally, commercial pharmaceutical and other commercial labs continue to siphon talented faculty and technical staff away from the academic enterprise.

♦ **Clinical Systems:** Most medical centers in the United States have made little progress toward the vision of an integrated electronic patient system or electronic medical record (EMR). Often, the needs of inpatient and ambulatory care units do not coincide closely enough to make an integrated system easy to deploy. Yet system planning and deployment continue, with HIPAA implications looming as a more substantial (and costly) compliance activity than even Y2K.

♦ **Medical Education:** Medical education (undergraduate and graduate) continues to be influenced not only by the advances in computing and the Internet, but by the high expectations of today's medical school students who have never known higher education without e-mail and the web. Medical schools struggle with the pressure for virtual experiences and comprehensive, immediate electronic presentation of required and elective courses. Medical informatics - as a curricular option - is still only present in a limited of number of curricula.

♦ **Technology Transfer and Intellectual Property:** Advances in biomedical research have pushed issues of intellectual property ownership and appropriately controlled technology transfer to the foreground at many institutions. Yet their handling of this volatile topic varies greatly, with significant repercussions to both individual faculty and their institutions. In some cases, a parent institution may provide these services, in others the medical center itself must hire (or contract) the legal and technical expertise necessary to protect its interests (which may or may not be the same as the faculty members' interests). Increasing digitization of scholarly material, coupled with changes in international copyright law, place added pressure on institutions to focus their limited resources in this area.

♦ **Organization:** Academic medical centers face numerous challenges with respect to the organization and delivery of technology support and services. Some medical schools are tightly coupled to their hospitals and clinical facilities, some are more tightly coupled to the universities of which they are a part. Medical libraries are sometimes the focus of much of the computing support and activity in the school, but at other institutions they serve only as the providers of medical content and do not provide computing infrastructure or support. Fundamental changes in these core relationships (like a medical school's decision to separate legally from its medical center) can have profound and disruptive effects on the infrastructure required to support the faculty and their work.

♦ **Standards and Support:** Standards are used to keep support costs in check by limiting the unnecessary proliferation of multiple technologies and the support burden it brings. Academic institutions can find it difficult to limit faculty technology options, especially when faculty feel they "own" decisions made with research dollars they have brought into the institution. The "Macintosh versus PC" battles that are a thing of the past at most corporate and university sites are often alive in academic medical centers where Macintosh still has a faithful following and some value-added to the computing environment. Finally, the few information technology professionals who are typically hired for specific projects are often distracted from their special duties by basic computing support that their faculty cannot adequately receive elsewhere.