We are living in unprecedented times where oncologists and their patients are facing disruptive changes in healthcare, medical research and medical education brought on by the individual growth and merging of the fields of information technology, biology and physics. This dramatic increase in the quantity, quality and ease of finding information and the effortlessness of connecting everyone and everything brought on by the Internet, has changed our lives forever. However, many of us remain frustrated with our inability to control this information overload in a time-limited living situation.

In the last 7 years, the practice of medicine has changed dramatically with large, multi-disciplined and integrated organizations becoming predominant rather than small practices. Oncologists are beginning to document our patient care using electronic media rather than paper and have seen the doctor-patient relationship become more patient-centric to include wellness and patient-derived data. Oncologists are also increasingly communicating electronically with all health care stakeholders including our patients.

Indeed, for the first time this new, disruptive digital world is fast becoming defined by information becoming electronically mobile, cheap, available to all and consumer-oriented to such an extent that almost all recent information technology advances in hardware and software begin with the consumer and not the computer professional or big business. Cancer doctors and their patients must begin to understand how we reached this point and where we are headed to better prepare for this new world.

Government grants to doctors are enticing them to use electronic health record (EHR) programs. Many meaningful use federal requirements center on electronic communication and documentation of medical data. All physicians will need to communicate electronically with patients and make available visit encounters or the entire patient record.

Only recently has the line between computing and biology begun to blur as the laws of the Information Age are applied to biologic processes and companies develop gene sequencers that rely on blending semiconductor chips, nanopore sequencing, robotics, chemistry, optics and computers to map the 3 billion base pairs that make up the human genome cheaply and rapidly. Oncology has been one of the first medical specialties that have taken advantage of this technology to compare gene sequences and activities of normal and cancer genes to molecularly stage our patients for a more precise cancer diagnosis, prognosis and treatment.

Cancer doctors in the past have been strongly criticized by the Institute of Medicine for not using health information technology effectively and not providing cancer patients with helpful information. In response, the American Society of Clinical Oncology has developed a patient and referring physician report that defines a Cancer Treatment Plan and a Cancer Patient Survivorship Plan that has been incorporated into many oncology electronic health records. Patients should request these reports from their oncologists.

Today, for the majority of our computer activities, we still use Windows and Mac OS X computers that use windows, icons, menus, and pointers. These computers can do pretty much anything, but carry the burden of 30 years of rapid, unplanned change. They remain difficult to navigate through the different parts of the program, require indeterminate training periods, and have poor learning recall without constant use. The introduction of the iPhone smartphone and later the iPad tablet has changed everything. With their instant on, instant off, multi-touch, multi-sensor and multi-communicator cloud-based computing along with a new conversationalist voice
interface called SIRI and the App model of purchasing software for simple “plug and playing” consumers and not businesses were the first to witness the future of integrated computer hardware and software coordinated through the cloud in which these inexpensive devices and their software became more humanly natural in operation.

Patients will continue to take a more responsive role in health care as they pay a larger share of its cost, make known their values and wishes and help make key decisions. With the unlimited educational resources of the Internet our patients have access to the same medical literature and textbooks that physicians have. Patients will have electronic access to their laboratory tests, imaging and procedure results and will eventually share in the control of their health record using their personal health record (PHR). A pilot project making almost the entire medical record electronically available to patients has been successfully implemented at MD Anderson where the majority of patients are more than satisfied and most doctors, many of whom were skeptical initially, have become converted proponents of “open access” care and the healthcare system has become more cost effective and safer.

With the advent of EHRs and PHRs it becomes obvious that there is a treasure trove of clinical data that is in these records that has the potential to benefit society by opening up what happens to the 97% of cancer patients who do not go on clinical trials. By learning about the comparative benefits or harm of our new treatments and procedures in non-clinical trial patients after their regulatory approval we can continually apply our findings and improve our treatments. ASCO and others have begun to define a Rapid Learning System for Cancer that will use the tools of the Information Age to develop a more thorough understanding of cancer biology, defining a cancer based on molecularly-driven diagnosis, and a therapeutic development system using oncology EHR registries to produce smarter and faster clinical trials. By having a more seamless integration of clinical and translational research it has the potential to ensure that every cancer patient’s experience can inform research and improve care and help us take full advantage of the wonders of the Information Age.

Acknowledgement – I would like to acknowledge Steve Jobs for creating the hardware and software that permitted me to enjoy the Information Age, “think differently” about technology and make the Information Age understandable, approachable and fun for the rest of us.

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