**Background**

1. Effective use of information technology in health care has been an elusive goal since the beginning of computerized systems. Part of the problem was and is the lack or use of standards, inconsistent views of what we are trying to do and how to do it. With the introduction of over 36 billion dollars, the problem is likely to become worse. An increasing number of groups are introducing new products in an opening and growing market, and the result is likely to be chaos, failed products and frustration.

2. From the beginning, most of us – coming from the computer/informatics community – and largely driven by the technology, designed what we thought the clinicians wanted. In fact most of the early designs went to great lengths to avoid the doctors having to use the system. We focused on the inpatient environment (because that’s where the money was, and only large institutions could afford the large mainframes on which these systems were installed), and we focused on the service aspects – mainly billing, ADT functionality, lab ordering and result reporting. Radiology systems followed (again highly technology based) and pharmacy systems followed, although little e-prescribing. Each institution created its own vocabulary and often a single institution supported multiple, incompatible vocabularies. We mapped to a specified set – mainly ICD9 and CPT codes – when required. Such is still the case today.

As minicomputers made application packages affordable in the outpatient arena, again the focus was on practice management and billing rather than on clinical use. Most systems were home-grown and often success was dependent on the developer. The developer left, and the system failed.

Personal computers further opened the market and computers became ubiquitous. The market opened further in other smaller sites of care. The term computer-based patient record and other names created the image of an electronic storage replacing the paper chart. The lower development costs as well as the lower startup costs increased the market and attracted more vendors into creating PC-based applications, although few had significant clinical components. Failures occurred frequently at all levels – from large academic medical centers to small to solo practices. Some of the failures were a result of incompetent systems, some because the company went bankrupt, some because of the complexity and lack of skills to properly install and maintain the system.
During the 1990s there are over 400 different companies who sold a computerized patient record system. The turnover in companies was large.

3. Where are we today? Little has changed. Many of today’s systems contain software over twenty years old. According to Washington-based Leapfrog’s 2008 Hospital Survey, only 7 percent of hospitals fully meet Leapfrog medication error prevention standards, and low percentages of hospitals are fully achieving mortality standards. Among surveyed hospitals, efficiency standards — defined as highest quality and lowest resource use — are met by only 24 percent of hospitals for heart bypass surgery, 21 percent for heart angioplasty, 14 percent for heart attack care, and 14 percent for pneumonia care. The voluntary Leapfrog Hospital Survey results include 1,276 hospitals in 37 major U.S. metropolitan areas, representing 48 percent of the urban, general acute-care hospitals.

The problems we struggled with in the 70s and 80s exist today. In 1991, the IOM published a book called The Computer-based Patient Record: An Essential Technology. The book was revised and republished in 1997 – 6 years later. The revision noted the significant changes in technology – processing speed, storage and communication speeds at reduced costs. But little progress had been made on the applications side. We still struggle with the same problems. The revision added two chapters – both progress reports and retained the original material.

4. So what is the problem? I have already noted some of the problems. Without a single focus, without a better understanding of what we are trying to do and why, without better coordination, without centralized guidance and purpose, we will spend 19 billion dollars and still be faced with the same problems. Fundamental to the problem, I think, is our view of what we now call the electronic health record – and it still has other names – the electronic medical record and variations called the population record or the personal health record.

The purpose of this meeting

Current systems have been designed by largely the technical community with some cross-over input from the medical side. “Real” practicing physicians have had little input into the design and functionality of today’s systems. That condition is largely by choice of both communities. As a result, there is a mismatch between what the technical community has designed and what the clinical community might need. Discussions of
technology turns off the clinical side, the technical side does not fully understand the clinical side. There is a chasm between the two groups. The purpose of this meeting is to build a bridge over that chasm that works with the expertise of both groups.

We know HIT is coming and will be forced, mandated or financially incentivized into the clinical community. Already, there are many war stories of disasters that have resulted from poor design and unforeseen circumstances. Unless the chasm is successfully bridged, what we do will be at best unsatisfactory and at worst a major disaster costing billions of dollars. We recognize that the clinical community is not interested in the technology of HIT, and we think that is reasonable. What we do need, however, is for the clinical community to understand and buy into the value proposition that it is to their advantage to take ownership of defining the form, content, composition and functionality of the use of HIT in healthcare. We propose to juxtaposition the two communities so they work together separately to produce an optimal systems that meets clinical needs. Unrelated to technology, we propose you – the clinical community – take charge of specifying what is required. We, the technical community – will listen then go back and develop the standards, tools, and applications to make it happen. You tell us what you want; it is our job to figure out how to do it. So that is the first purpose of this meeting.

Secondly, a purpose of this meeting is to set up a structure in which all interested parties – medical specialties groups specifically, adopt common processes and share products. We believe that there is an overlap in products and functions across groups. The aggregation of data across all sites and sources require that degree of cooperation among all of you and the group you represent.

We specifically propose the creation of a collaborative group of medical specialty societies and other appropriate and interested organizations that includes one representative from each appropriate group – and the selection of those persons would be up to each organization – that agrees on the processes, priorities and governance rules. The actual work may be done within each medical specialty group, or combinations of groups. The products would be held in a master repository or inventory and shared. Overlapping interests would be resolved through the leaders at a joint meeting that might be hosted by HL7 or within your own group. HL7 would define a method through which the clinical content and specifications would be brought back to the technical community for action. We would accept the responsibility for engaging
the appropriate standards partners to accomplish the required results. We propose the process and input include the global community and would leave it up to you as to how that might be accomplished. We would develop tools, integration guides, and work with the vendor community to provide products that would deliver the required functionality. Obviously, there is a lot of detail to be worked out. There are other groups that we would need to engage and involve - including government, regulators, auditors, payers, quality measures, and others. There would be costs associated with these common products, and we would look to the US government and other governments to support those costs.

The key message here is (1) bring the clinical community together to produce compatible and interoperable products, and (2) provide a bridge between the clinical and technical community. What you do, how you do it and the priorities will be up to you. We, HL7 and others, would provide whatever support, education and communication that might be required.

**Potential projects**

To help understand what I am talking about and what kinds of things we might do to get started, I would like to suggest some initial projects that would have immediate value. Some of these products already have some activity and we have some ideas of what might work.

**Data elements.** A fundamental unsolved problem that has prevented the aggregation of data, the expanded use of decision support, regional data analysis, reuse of data, and other purposes is the lack of a common set of data elements with common attributes. A recent article in the Boston Globe highlights problems in using claims data for clinical purposes and in attempting to use ICD9 codes to represent clinical data. In most cases, a patient’s medications are a better indicator of the problems and diagnoses a person has than an ICD9 problem list. The granularity of any controlled terminology is too coarse to represent data at the level it must be recorded to distinguish between patients and to drive the decision making process. Structured data represented by a well-defined and common set of data elements enhances finding data in the record and
permits the integration of data and knowledge that makes the computer an active partner.

We propose as an initial project, each medical specialty group, using a common process, create a master set of data elements with precise and unambiguous definitions, name that may be derived from existing controlled terminologies when appropriate, synonyms, a set of the possible values for each data element, units, data type, and other attributes. Each data element would be assigned a primary steward, and data elements of interest to multiple groups would harmonize to a single acceptable definition. If a single definition was not obtained, then there would be two different data elements, each with a unique, different and precise definition. This master repository of data elements, mirrored around the world and translated into multiple languages, would permit the world to speak a single medical language with enhanced understanding. The details of the process, of vetting to a larger group, etc. can be discussed later. Several groups have started efforts in creating data elements. We would propose to work toward bringing those groups together.

**Unique Person Identifier.** One problem that has been recognized for decades is the problem of patient identification, particularly when merging patient data from multiple sources. The AHRQ sponsored medication prescribing pilot studies were unable to create a patient’s medication history by merging data from multiple sites. Demographic parameters are inadequate; they have an unacceptable error rate. Regionally, some groups create a regional record that helps, that people of the boundary fall through the cracks.

**Electronic Health Record.** Legacy is overpowering. We are dominated by the past; we have not been bold enough to tempt the marketplace with new vision. If we don’t break from the past, we are likely to relive the past. The definition and purpose of an Electronic Health Record – and even its name – is varied and controversial. Many treat the record simply as a storage repository of data. Designers of EHTS have watched how doctors practice medicine and how they use the paper chart and try to duplicate that functionality electronically. We totally missed the point that doctors used the paper chart as they did because they had no choice. Data comes into the paper chart on pieces of paper, grouped by the batch nature of how work is done. We see paper discharge summaries as being useful, because a doctor has sorted through a lot of data
and pulled out the pertinent parts. If we are successful in collecting and merging all data from all sites from birth to death, then we will bury the clinician in data and make the situation worse. We are guilty of looking at a man riding a horse and trying to design an automobile based solely on those characteristics. We need to step back and understand that the problem is transportation. We want to go from point A to point B as quickly and as efficiently as possible. We need to step back and look afresh at the problem we are trying to solve.

The architecture of an EHR must support a variety of uses. It must support the problem we are trying to solve at a given place and time. The presentation of data depends on the next event. The computer needs to understand what is important and aggressively share that data with the user. Looking for a specific piece of data may lead to missing other key pieces of data. Computer systems need to reevaluate all the data and treatments with each new data entering the computer. Are initial decisions still correct?

The purpose of the EHR is to support more effective and timely disease management with a personalized approach. We support knowledge-driven filters for the presentation and exchange of data. We need to use accumulated data to determine factors that impact health including social, economic, and environmental situations. We need to focus on the impact of reducing negative factors. These approaches will influence the way providers practice medicine. We must change to take advantage of the new capabilities provided through new technology. You need to drive that use of technology.

The book “The Great Influenza” by John Barry documents the struggle to introduce the use of data into the practice of medicine. We now need to redefine the practice of medicine with the use of unbelievably powerful technology. We can leapfrog ahead in what we are able to do if we take a new look and reengage the problem. We need to understand it does not have to be what it is today. You say this is what we want – make it so.

The challenge exists today. The attraction of 36.5 billion dollars will attract many players, each with an opinion of how to do it. Now is the time for a focus. Now is the time to do it right. And this is the group that can, by working together, do it right.
The stimulus package promises a financial reward to clinicians who use a “meaning electronic medical record” – but without a definition. Many groups are now expressing an opinion of what that term might mean. Who better than this group can understand what that term should mean? We need a mechanism to define knowledge and integrate that knowledge within the EHR system to support both providers and patients. We need to define protocols for guidelines, disease management, dashboards, and easy access to knowledge on demand. We need to define a pathway to get from there to here. We need to understand change management.

This group has within its power the ability to create a new horizon for the use of information technology in health. We encourage this group to take that major step forward.