

Open and Closed Medicine

By Brian Lord, CEO Sequence Managers Software, LLC

Medicine is practiced essentially the same way now as it was several hundred years ago. There are new techniques, equipment, tools, materials, etc. However, the way a patient interacts with his/her physician is essentially the same.

A patient goes to see his/her doctor. The doctor gives the patient an examination and a diagnosis, documents this examination and diagnosis in the patients chart, gives orders or a prescription that they expect will be adhered to, and the patient leaves.

Essentially the same process followed for well over a hundred years. Some of you may say, of course, it is a refined and hallowed method that has been proven repeatedly. However, this scenario describes a "closed" form of medicine. "Closed Medicine" describes a healthcare system that is unable to openly share health-related information electronically, and in a timely, private and cost-effective manner. "Open Medicine" describes a healthcare system with openly available electronic patient health information shared freely between patients and their healthcare providers in a timely, private and cost-effective manner. Open Medicine has the potential to improve healthcare delivery in a dramatic way. Closed Medicine perpetuates the old model of healthcare delivery.

If the traditional paper medical record is used, then once entered, the information is completely useless after the physician has made his notes and closed the record. If the current wide spread proprietary medical software model is used then information is spread unevenly across multiple different pieces of software most of which do not share information with the other systems in the same office much less with different offices or other health care providers.

The tools, and techniques may be different than a hundred years ago, but the method, and process is the same. Information is recorded concerning a visit or a procedure locally, then stored away and used only when that particular provider is presented with a specific patient again. Not to say there are not some people trying to do things in a better way, analyze best practices, prove that new treatment options can improve health care, and do their best to help individuals and the common good.

No matter how you look at this process it is a closed process. Information is available only to a limited group of practitioners, it is static in that the information is only seen when the specific information is relevant, the individuals information, though critically vital to that person, is unavailable to another health care provider. This is Closed Medicine.

I present to you a current and common scenario. A patient has two doctors. A generalist, and a specialist that they are seeing for a chronic condition. Each physician treats the patient as best they can in any given situation. However all too often both physicians will make assumptions about the nature of the other physicians treatment, with no direct knowledge of medications or procedures the other is using in treatment. Only the anecdotal information provided by the patient. This has the clear potential of creating problems.

One solution in this closed model is to have the patient carry their medical record with them, and indeed this is done in some circumstances and by patients that require a health care provider have access to their medical record. However this too presents a problem with the physician not having a patient record for review after the patient has gone. An essential step to verify good practice, and also a typical practice of recording notes after the patient has left when there is less of a time crunch. In addition patients will often lose or misplace their record or not present it when an encounter happens.

I am sure as I've written here a dozen or more different scenario's can come to your mind illustrating perhaps better than I have the flaws in a closed system. At one point in time this certainly was the best that could be done. Best procedures, enhanced and formalized, peer review, improving practices, publishing, spreading said practices to as many as could keep up.

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Fortunately other options exist today. However before I discuss them I want to make reference to a war. It is a war that young people can scarce imagine, since no one really talks about it anymore. However to anyone older than 30 it is a war that you most likely participated in though you most likely didn't know it. It too was a war of a closed system being asked to open itself.

I speak of course of the great ATM wars of the 80s. A time when banks and a new technology made access to our money easier and more efficient. A time when the great warriors, Star, Pulse, Plus, and others, dictated to us which ATM could give us access to our bank accounts, and which could not. The results of the war were profound but today overlooked. Now it is accepted that anywhere you go, any city, any state, any country, you have access to your bank, through an ATM, and in the last 10 years through the web as well.

Why then, I ask can you is our medical information still closed? The benefits would be profound but to some perhaps not so obvious. Suppose for a moment that every time a patient received any form of treatment, prescription, or exam the information was available to the next health care provider, regardless of location. In a single year alone the cost savings in prevention of treatment mistakes caused by incomplete information would be in the hundreds of millions if not billions. Emergency rooms alone, which represents the number one location where patients are treated without complete knowledge of a patients preexisting conditions, or medications, this change would be profound.

However the changes do not stop at the personal level, although those in theory should be enough to justify such a movement. At a community level, the ability to look at the health statistics for a county, city, or specific area can give undeniable proof of public health related issues. The presence of some public health related anomaly would be identifiable, not after days or weeks of investigation, but in real time as such problems were happening.

My company is involved in a project designed to take information from different databases and in the case of a disaster, or a long term health problem, image all the demographic and geographical data and display this information in a true 3D imaging cave. Giving the University of Louisiana's LITE center the ability to watch a situation with a level of information that can point to such critical information as, where was patient zero, where will the problem move to next, how many people could be affected, what areas need assistance, etc...

In even broader terms, looking at health factors across the entire country, best practices could be identified, again in real time. In the traditional peer review model, a physician improves treatment of a disease state somehow, lets say he or she improves survivability of leukemia by 10%, an outstanding improvement. The doctor then does due diligence gets all his data in line and submits for review. The findings are peer reviewed and if found to be good the article is published in a peer review journal, other doctors read and incorporate this information into their treatments. However, the publishing doctor has no idea if over all, his statistics were 15% below the true survival rate of leukemics. The physician has not done anything wrong, yet his publication has actually lowered survival rates. Now in the long run more peer review articles would eventually correct such a deviation. This at one point was the best that could be done.

Not today. Today we have sophisticated information networks that allow banks, stock markets, material management firms, and many other industries to exchange information, lots of information, between countries, states, and even, as difficult as it may be to understand, between companies. This exchange has created new industries like, just in time manufacturing, virtual store fronts, on-line banking, and many more. All because information that is needed at potentially many different locations is easily transmitted and received.



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Except in one critical industry. Medicine. Medicine is still closed. The most sophisticated science there is, the science that is actually about us. While using some of the most innovative technologies available, is at least 2 decades behind the rest of the information industry. Why?

Tradition. Fear. Trust. Profit.

I think most will understand the problems with tradition, a new procedure of 20-30 years ago, becomes ingrained and thus difficult to get away from. Physicians are trained to use paper. A physical medical record is easy to use, understandable, and accepted. It is also vulnerable, single user, and not easily available in all the places it is needed.

Fear is common in the medical industry. Each patient a risk management assessment. They have a problem that must be treated, and every unknown is a thing to be feared. Most physicians practice the art of reducing unknowns to as little as possible so the fear of making a wrong decision is as reduced as they can get it. New techniques, new technologies are a cause for caution and caution makes people move, well, cautiously.

Trust is difficult for many physicians for two reasons. First when a new technique or piece of equipment is introduced into a physicians practice they do what every good scientist, or craftsman does with it, they become familiar with it. Learn its quirks, specifics, limits, and dangers. For most tools presented to a physician this represents weeks, months, or in some cases years of training. Yet in the case of computers there exists a barrier that most physicians do not have the time to cross. First of all it does not directly relate to treating patients, it is not a diagnostic tool, nor is it a treatment, it is just a place of information software, and each piece of software represents a specialized piece of knowledge that most physicians do not have time to learn to trust, or inclination to do so. As a result the powerful, flexible, and truly capable tools that could be available to a physician through the computer are placed in the hands of those that are not physicians, and thus the physician finds themselves in the position of having to trust someone else to provide them a tool they must use.

Which brings me to the second problem with trust. What is the difference between a car salesman and a software salesman? Car salesman know they lie. Doctors have been lied to about medical software for so long, that most don't know what to believe. Some try very hard to catchup and become familiar with what software options area available, and others don't have time, or inclination. Yet almost every physician that has purchased some form of medical software has been told or lead to believe a feature was present that was not. Often the feature is irrelevant, occasionally it is critical. Critical features missing from a piece of software, regardless of how good the software is, render it useless, and costly. Thus the medical profession has a great deal of factual reason not to trust software.

Profit is the current model for medical software. In the 70's and 80's computers for business, and hospitals were huge multi-million dollar pieces of heavy equipment. They cost a great deal. Today a production grade server will certainly cost you tens of thousands of dollars, but not the millions of yesterday. Yet the existing medical software industry still charges huge fees to do work that costs them less and less to do. Not that it has been easy for the medical software industry however we are not hear to discuss the medical software industry at this time. As a result of the profit model, an industry that has been used to being paid millions for access to large systems, still expects to make huge profits on each installation. Thus costs have remained incredibly high. So high that a single doctor can scarce afford the level of computerization available at a major hospital level. At least not in the traditional closed medicine model.

So now we have discussed at length the nature and problems created by closed medicine. What is Open Medicine? Simply put Open Medicine is the interconnecting of all medical information systems, in such a way that every medical system is able to access needed information from any location. In its totality such a system is still years away. It is however closer than the medical software industry would like the health care industry to think. The Department of Veterans Affairs, the largest healthcare system in the United States, continues to explore the concept of Open Medicine with the ongoing development of VistA, and MyHealtheVet.

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In a truly open system, similar to the banking industry, an authorized user, such as a patient, or a physician would go to their EMR system, and open a patients record. If the patient is a new patient a PIN, smart card, or biometric would be required to verify that the patient was giving permission to the health care provider to access their information. Any new information would be kept on the providers system, what ever that system might be, and a reference in a Master Patient Index would be made that new information was available.

Complement this model with large scale open source medical software, which has significant advantages over proprietary software models, and the capacity of every medical system to work in concert grows exponentially. In order to understand what this means it is necessary to explain in a small amount of detail the power of open source software, and how it relates to medical software.

In the traditional proprietary software model a product is created. As items are sold and money is made, engineers are assigned and bugs are fixed, and new features and functions are added. As the product makes more money, i.e. sells more product, more features are added and more bugs are fixed. At some point sales begin to trail off, and less engineers are assigned, and less feature function are added, and fewer bugs are fixed. This trend progresses until eventually no new work is done on the product and though it may still be sold it is essentially a dead product.

Open Source life cycle is different. As an Open Source product comes into use, a community familiar with the software grows around it, in addition to the original manufacturer, other engineers begin to add feature function and fix bugs. However since it is a variety of companies that use the product and want enhancements no single company has control or responsibility for the direction of the software. Essentially the software grows according to the strengths it has. Which only keeps the software stronger as the users of it enhance it even more. Every proprietary software product has a life cycle. In some cases this life cycle can be very short. However once an Open Source product grows its community its life cycle becomes extremely long. Many of the Open Source software products from 30 and 40 years ago are still around. A perfect example would be the Linux operating system. Still in use, still robust, and the preferred operating system for systems that are used to do vast quantities of work. The fact is that the Linux that exists today, is not the Linux of 5 years ago, and will not be the Linux of 5 years from now.

How does this relate to medical software. To put it bluntly medical software needs to be extremely complicated. So complicated in fact that no single company can adequately maintain such software since the intellectual capital necessary to maintain and enhance such software is beyond the means of any company even very large companies. However the Open Source communities with their subject matter experts and devotion to the software do contain such intellectual capital.

The solution many companies have adopted is the obvious step. If you can't do it all, find the piece you can do and do that very well. Hence numerous keyhole medical applications have come on to the market. Some priced so even small doctors offices can afford them. Applications like scheduling, billing, coding, and such, all perform a specific function in an office that a computer can do very well and are maintained by a company that can specialize in just the functions that software provides.

However that has now created the problem that plagues all medical facilities today. All of these applications do valuable functions, but none of them talk to each other. Worse, the cost of having them interface to each other is huge, assuming you can even get each vendor to agree to do the work, a specialty in and of itself that many software companies do not have. So each clinic and hospital using such "keyhole" systems are forced to bounce from paper to electronic to paper to electronic, the most inefficient way of doing work. Computers actually add to the work process not reducing. Again the problem of closed medicine.

So is there a point to discussing the difference between proprietary and open source software? Is there any way this concept can be used to solve the problems of migrating from Closed to Open Medicine? Many of the pieces are already in use and ready to come into wider spread use. The recently CCHIT certified WorldVistAEHR system is one of the most comprehensive and capable systems available. It certainly has the capacity to eliminate paper records in the largest or smallest hospitals. Network accessibility to broadband transmission speeds make moving the volume of data in a patients health record easy, and the security used by the banking system prove that such information can be restricted to only those needing access to this information. However the primary road block is not a lack of technology or a system that can handle such a large quantity of information.

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The primary problem is a desire on the part of the medical software companies to change their existing data models. During the ATM wars there were large banks that were afraid that a wide spread use of ATM machines would actually put them out of business. History shows this was certainly not the case. In a similar way the medical software companies have no pressure to change the way they exchange data and are afraid that a major change to their monopoly on the medical data that contain will force them out of business.

The way to change this is for the physicians and medical facilities to demand of their existing medical software vendors the ability to move patient data from one facility to another. Small practices that have numerous keyhole applications need to explore the now much more reasonably priced true EMR vendors that are out there, and recognize that a single integrated open source system, can be much more cost effective and efficient for their practice. Also ensuring that such a system is linked in with the growing number of Medical Exchange systems that are beginning to be seen, like those that actively participate in the Connectathons originally started by another open source proponent Sun Microsystems.

Medical software vendors have been creating their own path, and telling the medical community what was possible and pricing alternatives out of the range of any but the most wealthy medical institutions. However that model is changing. By trying to ensure that each health care professional understands the modern choices and what physicians have a right to, a new age of medicine can begin. One where every patient is seen with all available information. One where the health of a community or even the world can be seen and the successes no matter where they are can become successes for all. One in which medicine is no longer closed but open to the future.

Brief Biography

Brian Lord is a scientist with a Medical Technology and Physics background. His company Sequence Managers Software currently is one of the few companies providing small practices and rural hospitals access to EMR technology. He lives in North Carolina with his wife and children. He has served on the board of directors for WorldVista and is a member of the Vista Expertise Network, a not for profit technical organization dedicated to enhancing open source medical software and bringing it to the world.

