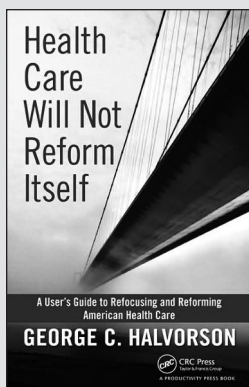


The Perfect System

George Halvorson



Because the ideas discussed in George Halvorson's new book Health Care Will Not Reform Itself are central to the current national debate, we are pleased to be able to share with our readers Chapter Five: "The Perfect System." In a recent e-mail to Kaiser Permanente staff, Mr Halvorson noted, "The book talks about the short-

comings and challenges of health care in America, calls for universal coverage, and suggests that we need to computerize the health care database for all Americans."

Health care needs and deserves the perfect computer system. We should begin with that goal and build our national and collective system agenda and IT investment strategy with the creation of a perfect system as our clearly targeted end point.

What would a perfect system for health care look like? We need to be very clear from the beginning what our expectations for a perfect system are if we are going to invest billions of dollars in health care IT as part of the national economic recovery agenda. We should be very focused on building the essence of the right system. We don't want to lay that track twice.

All, All, and Then All

The perfect system for care should have "all of the information about all of the patients all of the time." Real time care data. Comprehensive care data. Data for everyone. All, all, and all.

That single very basic goal should define, direct, channel, guide, and inform our overall American health care system's agenda.

It would be breathtakingly stupid to put health care data on the computer and end up with the same sets of isolated, inaccessible, noninteractive information silos we have now with paper medical records. We need

all the information about each patient. We need that information all the time—whenever and wherever care is being delivered.

Caregivers should not have to guess about their patient's prior diagnosis or treatments. Caregivers should not be ignorant of patient medications or relevant test results. Caregivers for each patient should know all of the medical information about each patient, and caregivers should have that information available in real time at the point of care. That should be our goal. We should settle for nothing less.

Medicine is an information dependent science that operates far too often with a highly dysfunctional information deficit. That is wrong. We need to do better.

Information Security is Essential

If we really want optimal care, we need optimal information. Information security needs to be an absolute expectation as part of the package. That almost goes without saying. But it needs to be said.

Personal care information needs to be personal. We need real time and complete information to provide care and to track care and to do world class research about care. We need that information to be appropriately confidential so that it is used exclusively to support health and care.

Anyone who violates patient confidentiality and violates that confidentiality for some form of monetary gain, personal coercion, or to damage the reputation or credibility of a patient should be treated and penalized as a criminal. We need strict standards on use of data and we need strict penalties for people who willfully misuse data.

CQI is Needed—and CQI Needs Data

We very much need data. Care coordination cannot happen without data. Continuous care improvement simply cannot happen without data. No industry has ever done continuous improvement without data. Optimal medical research cannot happen without data.

The really good news is that we are on the cusp of a golden age for medical research. Most medical research done in the world today involves very small numbers of patients. The research is done most often to justify the sale of a drug or a product. When the "justification" process that triggered the research has achieved its goal

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of getting the product to market, the research about the effect of that product usually ends. So we often don't know what the long-term impact of a product or pharmaceutical is for patients in any systematic way.

That is a really bad information deficit. Why does it exist? Think like an economist. Follow-up doesn't happen for the majority of those research projects today because there is no business model that rewards follow-up.

If anything, follow-up research might run the "business" risk of the manufacturer learning that a profitable product might be dangerous or dysfunctional over time. The people who own the product and fund the research don't necessarily want to learn that their product is more problematic over time. So they often don't build follow-up research into their budgets.

Follow-up research also doesn't happen because the information pieces needed to actually do adequate follow-up research on most new products, devices, technologies, drugs, or treatment approaches are almost always entirely patient specific. Therefore, the information about

any product is scattered into thousands and even millions of unconnected, isolated, hard-to-decipher paper medical records with no way of pulling out the needed information other than to have individual, on-site researchers manually find, pull, and read each and every individual patient's paper chart to look for information relevant to the product or treatment. Ouch.

That's an embarrassingly inadequate situation. As we look at building the "perfect system" for health care, we should not accept that situation any longer. The health care community should know year by year the ongoing success rate or failure rate of each kind of implant and each kind of treatment for each kind of patient, and should be able to use that information to make future decisions about care—both for new patients and for the patients who already have the implant or the prescription or the type of care.

That level of specific treatment follow-up can be invaluable. A few recent successes in those areas give us a sense of what is possible. Kaiser Permanente has already used its own computerized database to track the long-term impact of people using VIOXX for pain relief and discovered serious downstream outcomes for a number of patients.¹ VIOXX ultimately was removed from the market. Kaiser Permanente also used its current database to look at the longer-term outcome for patients with various types of heart stents. That research uncovered some concerns about patient outcomes over longer periods of time relative to some

stents. The caregivers involved in that research ultimately recommended that patients with some stents be put on lifetime follow-up medication to reduce the risk of future heart damage. The manufacturers were not doing that research. Likewise, follow-up research into the Kaiser Permanente computerized registry of joint replacements showed major differences in the outcomes for different care approaches.

American Health Care Needs a Culture of Continuous Learning

That kind of follow-up research should be standard for every aspect of health care. It cannot happen and will not happen until we have data and the data is available for research.

Remember the basic and fundamental goal we need for The Perfect System in America: All, All, and then All.

When all of the data is available for all of the patients, longitudinal tracking of the long-term impacts of a given drug or implant or surgical procedure will become the basic working knowledge base for care, rather than a rare event, done infrequently, shared inconsistently, and seldom replicated.

So why is the recommendation for The Perfect System the goal that caregivers should have all of the information about all of the patients all of the time and why have caregivers at Kaiser Permanente adopted that basic data availability standard as a goal? It's helpful to understand that Kaiser Permanente has gone through a relatively useful learning curve over the past couple of years about the use of computer systems to improve care. This is probably a good time to share some of that learning.

Most of Health Care is Splintered

This is not a book about Kaiser Permanente. But to understand the nature of the multi-year Kaiser Permanente learning process about computer support for care, it's probably useful to get a quick sense of how Kaiser Permanente is structured and how Kaiser Permanente has begun to use computers. The current investment in computer support at Kaiser Permanente is slightly over \$4 billion, so there has been a recent chance to do some serious learning.

As noted earlier in this book, most of American health care is divided into separate, unlinked, unconnected pieces—independent business units that often compete with each other for patients and market share. Hospitals compete with other hospitals. Within a given hospital, there can be anywhere from a couple of separate physician practices to hundreds of separate physician practices. A given hospital might have several sets of sur-

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geons, several sets of oncologists, multiple independent internists, a raft of unlinked family practitioners, and a whole array of independent pediatricians, obstetricians, and various medical specialists and subspecialists. They usually all compete with each other for patients.

There are a lot of competitors in care delivery. Pharmacists compete with other pharmacists. Drug stores compete with drug stores. Labs compete with labs. And all that vast array of competing independent caregivers tends to get paid by another array of competing health plans, insurance companies, and various government program payers, like Medicare, Medicaid, the Veterans Administration, and some local welfare programs.

It's an uneasy set of relationships most of the time. Most of the providers complain about most of the health plans relatively often, and most of the health plans have an arm's length and sometimes problematic relationship with most of the caregivers. There are exceptions, but that is a fairly common set of realities.

The net result of that morass of competing and siloed business entities is that cooperation levels are often amazingly low. Getting each of the independent surgeons and surgical groups at a given hospital to simply agree on the best surgical tray to use for patients in that hospital can be an almost insurmountable task.

Agreeing on a common computer database is even more unlikely. Health care in America is splintered into an amazingly complex set of silos and pieces and separate, independent business units, and each business entity tends to have its own separate data filing system.

So how is Kaiser Permanente different from that normal care delivery context, and why does that difference cause Kaiser Permanente to think differently in some key ways about how computers can and should support care? Kaiser Permanente is a vertically integrated care system that has embedded—inside its own functional umbrella structure—all the key elements of care. Kaiser Permanente is basically a caregiver. Hospitals, clinics, pharmacies, laboratories, imaging centers, home health programs, health educators, and multiple other types of care are included inside Kaiser Permanente as part of a “vertically integrated” care model.

Kaiser Permanente serves about 8.5 million people with a staff of about 160,000 employees and nearly 600 care sites. The Permanente Medical Groups may be the largest private medical groups in the world. The Permanente physicians exclusively treat Kaiser Permanente patients. So Kaiser Permanente is basically a very “vertical” provider of care.

Kaiser Permanente also is a health plan. As a health plan, Kaiser Permanente enrolls the members who be-

came the Kaiser Permanente care system patients. In its entirety, Kaiser Permanente is an almost self-contained blended model of financing and care delivery.

The total Kaiser Permanente organization serves a population bigger than 40 states and 140 countries,² and currently has an annual revenue flow of \$40 billion.³ The Kaiser Permanente infrastructure is big enough to create and sustain its own health care eco-system and data flow capabilities.

So Kaiser Permanente thinks a bit differently and more comprehensively and holistically about linkages, support systems, and shared data flow than most elements of US care delivery. Kaiser Permanente can and does think about computer systems and data flow from the perspective of comprehensive patient care, rather than the perspective of competitive patient care.

Kaiser Permanente set a goal several years ago to implement care-focused computer systems that would give all the doctors all the information about all the patients all the time. As noted above, Kaiser Permanente has invested roughly \$4 billion to do that work and achieve that goal. The Kaiser Permanente HealthConnect electronic medical record (EMR) project is probably the biggest single private systems project ever done in any industry anywhere in the world. It has been successful, and every Kaiser Permanente Medical Group physician now exclusively uses the Kaiser Permanente HealthConnect medical record for his or her patient care. Every single Kaiser Permanente patient now has an electronic record instead of a paper record.

Paper medical record systems for Kaiser Permanente clinics disappeared between 2004 and 2008.

One-Third Reduction in Broken Bones

As a result of having that new database, Kaiser Permanente is engaged in a number of processes and programs to improve care. No one has ever had all that electronic information about patients before, so there is a major learning process underway. The Hawaii and Denver projects mentioned in Chapter 4 that made major improvements in care for chronic care patients in their geographic areas have been and are part of that overall learning process. A similar computer system-supported “Healthy Bones” program that was set up two years ago for all seniors in Southern California has managed to cut the number of hip fractures for those patients by 37%.⁴ The EMR was used to help the Southern California care teams focus on the needs of seniors at risk of bone damage. The whole effort was extremely successful. Healthy Bones programs are now rolling out to all Kaiser Permanente care sites.

If a similar Healthy Bones program could ultimately

Every single Kaiser Permanente patient now has an electronic record instead of a paper record.

be implemented for the entire country, that effort could reduce broken bones for all American patients by over 100,000 bones a year.^[4] That's a lot of people who could be walking instead of limping, being pushed in a wheelchair, or functionally immobile.

Other care sites in America make more money when bones break, so those kinds of prevention programs don't exist now in most care settings in America.

So what do these successes tell us as a country in need of health reform? Because Kaiser Permanente is a total care system and basically plays every position on the health care field, Kaiser Permanente naturally thinks of systems from the perspective of the total patient, not just as a specialty-defined or care-site-defined piece of the patient. So Kaiser Permanente has had very good operational and functional reasons to figure out what an optimal data flow should look like for health care.

The question that was defined years ago by the medical brain trust at Kaiser Permanente was, "How can we use computer systems to help improve care?" The answer to that question was to build computer systems that are focused on patients, not on care sites or caregivers, and to create complete information connectivity, not electronic data silos.

"All, All and then All" was the first goal. The second goal created for the care support computer systems was equally clear: "Make the right thing easy to do."

Make the Right Thing Easy To Do

That may seem like more of a slogan than a strategic agenda, but when you begin to think systematically about care improvement, the importance of both elements of that goal become clear. We, as a national care infrastructure, need to figure out the "right thing" and then we need to "make it easy to do." That goal is so simple it is profound. It's a great guide for system design.

Why are those two goals and that learning relevant to the rest of American health care? Because computers are obviously and inevitably going to be used by all American caregivers—fairly soon. Decisions made now about system design, content, and desired use will affect how well that ultimate macro system of electronic data functions for all Americans in the future.

We, as a country, should not allow system development for health care to simply develop haphazardly or grow in silos. Thinking of computer support solely in the context of single care sites, single specialties, or single testing processes will never get us to optimal care results. We are starting in a deep hole as a country.

As noted repeatedly in this book, health care does not currently have a robust data support infrastructure in this country. That infrastructure will, however, be built in some form or another over the next few years because lots of people are now trying to computerize individual pieces of care. It would be very possible to build that ultimate infrastructure entirely wrong. It would have been incredibly stupid for Kaiser Permanente, for example, to build one computerized database for surgeons and another, unlinked and unrelated, computerized database for internists. Having stand-alone and unconnected data silos for allergists and neurologists would have been a very bad strategy for Kaiser Permanente to follow. Not having all pharmaceutical information available in each patient's database would also have been both silly and dangerous.

The Patient Should be the Focus of Care Data

The key has to be to have the patient be the focus of the data pool—not the care provider—and to figure out the specific connectors needed to bring together all the care data for each patient who needs their care connected.

Connectors are critically important. As stated in Chapter 4, we can't really cut kidney failures in half as a country unless the full team of doctors working with each high-risk kidney patient is working in sync to make care better for those patients.

Ten Criteria for Ultimate System Design

So in a nutshell, the Kaiser Permanente learning about data systemness (*sic*) is that the new American health care database should be:

1. Patient focused
2. Complete
3. Accessible by all relevant parties
4. Current (real time, if possible)
5. Easy to use
6. Linked to care improvement programs
7. Accessible to patients as well as caregivers
8. Transportable (when people change health plans or caregivers)
9. Interoperable
10. Confidential—with confidentiality enforced

How is that general strategy working so far for Kaiser Permanente patients?

Six Million E-Visits

It is a work in progress—and progress is being made. Kaiser Permanente patients now all have secure access

at home to their own medical records. Patients can also do e-scheduling, get lab results electronically, and have e-visits and hold secure messaging e-dialogues with their own Kaiser Permanente doctor. Last year, in California alone, Kaiser Permanente patients had over six million e-visits with their physicians. Most of those visits were in lieu of the patient having to drive to a clinic, check in, wait in a waiting room, wait in an exam room, talk to the doctor, get dressed, check out, and then drive back to work or home. Instead, six million times, the patient simply put the relevant question on the computer and pushed “send.”

Secure messaging and e-visits done by physicians with a high level of medical confidence are possible today because each Kaiser Permanente doctor receiving the electronic message from their patient can now instantly pop up that patient’s complete care data on their own screen to be fully informed about all the patient’s current care-related medical history before sending back a response.

That kind of connectivity and informed interaction between patients and caregivers is a path that will make sense ultimately for all of American health care. It won’t happen to any scale, in most settings, however, until physicians receiving the e-mail from their patients have convenient electronic access to that patient’s medical records or—minimally—to the patient’s electronic personal health records (PHRs).

Connecting data from multiple care sites and caregivers should be a top priority goal for the future of computerization in American health care.

All New Systems Should be Connectable

Any new hospital or private practice computer system implemented from this date forward should be set up to have the ability to connect data electronically with both payers and other caregivers. Both buyers and payers have the potential to play a major role fairly quickly in facilitating health care data connectivity. The current claims-based electronic care data sitting in the payer computers should be made available in a standardized format to both patients and caregivers. Right now—in a typical, American highly splintered care environment—a given patient might see six doctors and use two or more separate, unlinked hospitals. A recent Medicare analysis of patients with multiple comorbidities showed that the patients saw an average of more than a dozen doctors each in the prior two years. None of those care sites usually has any way of knowing about the actual care delivered at the other care sites. Most caregivers in America today have no

transportable data except for pieces of paper. And that data is not connected with any other health care data in any useful way.

The Perfect System is Possible

So what should the perfect system look like? Complete connectivity should be the goal. Lab tests, electronic images, and diagnostic tool outputs should all flow electronically to the care site of the relevant doctor for each patient.

EMRs and labs should exchange data electronically, not using a data flow involving intermittent chunks of paper output that is subsequently re-entered—usually manually—into someone’s computer system to achieve electronic storage status.

Patients should ultimately have complete connectivity in their homes. Telemedicine is already a good tool for certain conditions. Electronic monitoring of high-need patients can be done from the home. Pilot programs in various sites are doing that now. Mechanisms that track blood sugar levels, weight, physical activity or inactivity, and even mental functioning can all be installed now in homes and linked electronically, in real time, to appropriate caregivers and care teams. Video medicine should definitely be part of the next round of care connectors.

Eliminating many doctors’ office visits should be a clearly defined goal of care support system design. Eliminating a major percentage of emergency room visits ought to be another system goal.

Cell phones can, should, and will become more versatile care connections both for the spoken word and for lab results and care instructions. The creativity levels will exceed anything we can think of now. One new system being piloted uses the cell phone to photograph every single food item that the patient eats each day and computes both likely calorie counts and the possible health impacts of the photographed food. The use of cell phones to transform pieces of care is going to quickly go past care delivery enhancements that we thought were possible just a few years ago.

People who advocate for The Medical Home should think of that concept from two perspectives: 1) creating a medical site that is the coordinating home for a given patient’s care, and 2) the actual home, itself, with each patient’s place of residence connected electronically in appropriate ways with each patient’s caregivers.

Ultimately, systems should become a fully embedded tool of caregivers and care. That process is just getting underway.

In the interim, some caregivers like Kaiser Permanente, The Mayo Clinic, HealthPartners, The Geisinger Clinics, and The Cleveland Clinic already have EMRs for their patients. Some are beginning to extend the linkages into the patient's workplace and home. Patients at those multispecialty clinics can now get electronic access to their own medical information. In some settings e-visits, e-scheduling, e-consults, and e-supported behavior change models are all already in full operational status.

Personal Health Records Can Fill Part of The Gap

Patients who don't have a full level of complete EMR-based data available from their caregiver should and could be able relatively soon to get an interim level of connectivity with fairly complete care data through payer-based standardized Internet-available PHRs from their health plans. As noted earlier, that claims database is now badly underused for care improvement and it can be the basis for computerized, Internet-accessible PHR functionality.

Buyers should demand that their payers produce at least PHRs for their employees. Most American health plans—if required to do so—can already produce some type of PHRs for their enrollees. Most patients with direct electronic access to their own computerized PHR report a high level of satisfaction with that access.^[5] The PHR can be a very useful care support tool and it should be both encouraged and required by all payers.

It should also be relatively easy to link data from the claims flow and the PHRs to appropriately designated registry databases for each patient, particularly if the payers require the PHRs be designed to achieve that goal. It will be fairly easy for well-motivated health plans to designate a service or a caregiver to monitor the care delivered in each registry, to be sure that appropriate care is being delivered for each patient.

The logistical challenge that needs to be solved in most settings will be to get the relevant data from the registry to each relevant doctor at the actual point, time, and site of care. Ideally, the various health plan system teams should set up a shared linkage into the registry databases so all providers can connect to the Internet and get linked to the care registries designated by the buyers for their patients. That level of single contact entry point is being piloted now by multiple health plans and caregivers for real-time claims input and adjudication. A similar linkage is a very good idea for registry functionality.

Hub-and-Spoke Connectivity Can Be Computer Supported

Ultimately, electronic care connectivity could transform care in America and across the planet. Computer technology and connectivity can transform care everywhere. It's not hard to imagine a fully computerized hub-and-spoke level of connectivity for third world countries (and even medically underserved rural America).

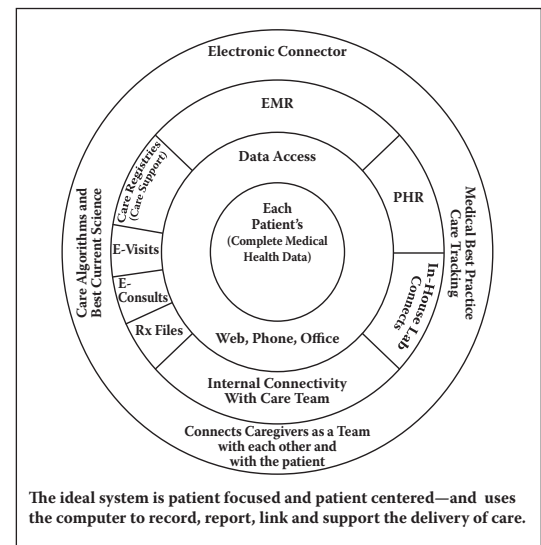


Figure 1. Support Systems Needed—Patient-Centered Systems.

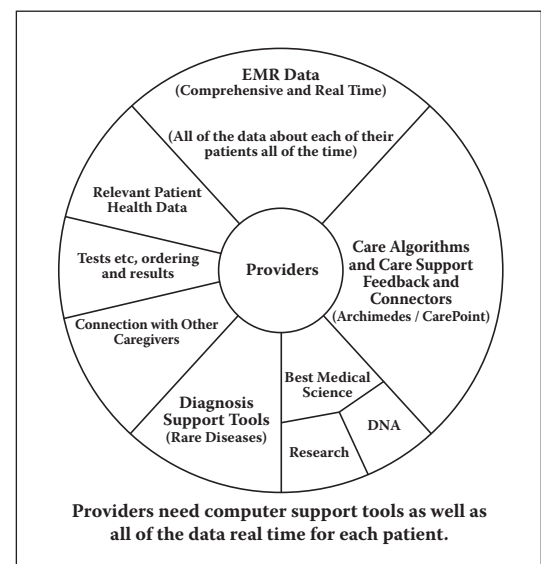


Figure 2. Support Systems Needed—Provider-Centered Systems.

Virtual Care in Remote Sites

Telemedicine has a great future. It can bring high levels of expertise very efficiently and effectively to the exact sites where the care is needed.

Solid telemedicine linkages are not very far into our own future. Pilots are being done in various American sites now. In some cases, the care is being linked into people's homes; in other cases, the information links go to remote American care sites staffed by front-level care

to support people. Those same kinds of tiered, computer-supported knowledge and care linkages may be the key to the only possible care design model that might work logistically for much of rural Africa, India, and China.

Next Step—Connectivity

Right now, in this country, we need to computerize care. We need to connect care. We need to connect caregivers.

We need data to track care outcomes and to continuously improve care. We need data for ongoing medical research. We need patients to know what works and we need caregivers to know what works.

We also need to make the right thing easy to do. It might be a good idea to take advantage of the learning cycle that Kaiser Permanente had been on relative to using computers to help support care and use the ten criteria for ultimate system design outlined earlier as a framework for making strategic decisions about IT investments for the country.

If we start with the premise that we need all the information about all the patients all the time, then we can develop various system elements in various places—and the linkages will be there. It's a little like the Internet—creating a Web of interactive data flow—rather than silos of unconnected health care data locked into separate machines. We simply need better data about care and we need it whenever caregivers deliver care.

We spend \$2.5 trillion on care in this country. We should keep track of the care we deliver and we should make our care better. To do that really well, we need everyone to have health coverage. We need everyone in the database. We need everyone in the database on The Perfect System.

Covering everyone is the right next step. Let's look at why that is true. ❖

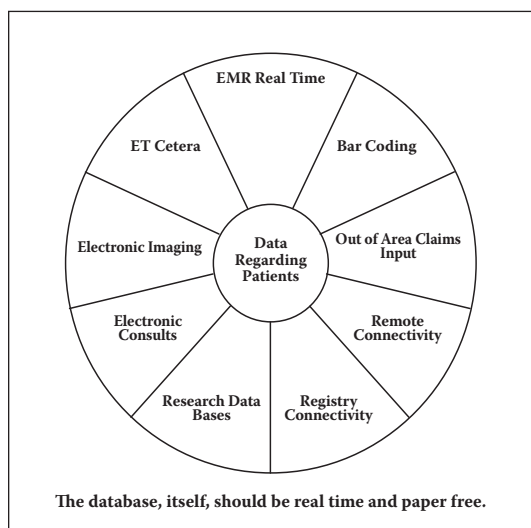


Figure 3. Support Systems Needed—Data Base/Data Flow-Centered Support Systems.

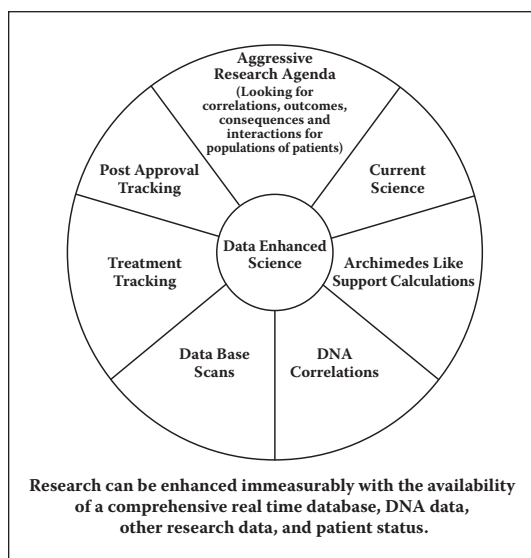


Figure 4. Support Systems Needed—Science Support for Culture of Continuous Learning.

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