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An Unimagined Opportunity for Radical Innovation in Healthcare

This document is addressed to President-Elect Barack Obama's healthcare team to suggest how we could work together to significantly reduce the costs of healthcare service delivery and increase quality at the same time. Additionally, our approach will contribute directly to the economic recovery—not only by creating jobs to build the new infrastructure, but also by using automobile plants for the manufacture of healthcare facility components. Finally, the facilities we are proposing are well-suited to satisfy urgent needs of the Department of Defense (DOD) and the Veteran's Administration (VA) to provide better care for soldiers.

Abstract

As Senator Daschle said in a December 3, 2008 conversation with Doctors for Obama, healthcare reform calls for a shift in paradigm, new actions on a number of fronts, and a different infrastructure to support a new era of healthcare.

Our approach, which is ready for use, focuses on designing, manufacturing, and assembling mass-produced customized, scalable, permanent, high-quality healthcare facilities in a fraction of the time, with costs dramatically lower than comparable conventional facilities—lower by 60% or more¹. We have also demonstrated a novel approach to organizing healthcare service delivery that is nearly twice as productive as that found today in well-run U.S. facilities. Our overall approach was developed in Seattle over the last four years through a collaboration with a distinguished team of physicians, scientists, engineers, builders, and architects, including a 2001 Nobel Prize recipient and a Senior Science Advisor to the U.S. Army Medical Research and Materiel Command.

These high-tech facilities can be used for small neighborhood clinics, ambulatory surgical centers, diagnostic centers and laboratories, short-stay hospitals, or even as replacements for larger, aging regional hospitals. The facilities can be given a look and feel that ranges from luxurious to utilitarian, and can fit in any neighborhood.

President-elect Obama has already mentioned his interest in several productivity improvements that our facilities deliver. These facilities are an appropriate platform for networked information technology that has already been developed. They can be easily set up so that one doctor supervises work going on in a number of facilities. In addition, our facilities are designed to combat dangerous hospital-acquired infections; they are constructed from impermeable, cleanable materials (primarily steel and plastic) and have near-laminar airflows throughout. To boost productivity even further, our facilities can be quickly reconfigured – walls, functions, and services– to deal with changing patterns of demand and new healthcare technology.

The centerpiece of our invention is its distinctive engineering—the design of a new class of healthcare facility that will itself underpin a new industry. Our products will serve both domestic and international markets, create new jobs, and generate substantial revenues. Decisive benefits of our approach include adding health care capacity when and where it is needed (including improved healthcare for members of the armed services); improving the operational productivity of healthcare professionals; controlling pathogens more effectively; and using existing, threatened and underutilized automobile manufacturing capacity and labor.

To move rapidly, we propose a program of initial installations in the DOD, VA, and the State of Washington (where the many benefits can be readily appreciated) to formally validate the approach we have defined. With seed money and political support from the Obama Administration, we can provide hundreds of attractive, flexible, efficient and safe healthcare facilities throughout the U.S. within two years. They can be focused on the diseases that put the highest burden on the U.S. economy including diabetes, end-stage renal disease, cancer, and chronic heart disease. In two more years, thousands of additional facilities could provide the foundation for a wholesale revolution in healthcare in the U.S., exactly on time to address demands from baby boomers and others that would otherwise overwhelm our current healthcare system. Investments for our proposal would be highly leveraged— attracting many billions of dollars in new capital investments and productivity savings, and at the same time creating new jobs and the opportunity to redeploy assets from the ailing U.S. automobile industry.

Please contact Chauncey Bell, CareCyte Chief Operating Officer, at 510 717 0183 or cb@carecyte.com if you would like to explore this proposal, talk to some of the leaders who developed the innovations, or to get an in-depth presentation about the facilities and their advantages.

Our more detailed proposal can be viewed at <http://carecyte.com/CareCyte-Idea-for-Obama-Healthcare-Team-20081219.pdf> or at the CareCyte Blog found at <http://www.carecyte.com>.

Seattle-based CareCyte designs, prototypes, optimizes, fabricates, and assembles revolutionary facilities for primary, secondary and tertiary healthcare service delivery. The company is led by a team with rich experience in the design of healthcare facilities and medical practices, construction and construction engineering, and medical service delivery.

An Unimagined Opportunity for Radical Innovation in Healthcare

In a December 3, 2008 conversation with Doctors for Obama, Senator Daschle said that healthcare reform calls for a shift in paradigm, new action on a number of fronts *and a different infrastructure*. The right facilities are essential to the delivery of quality healthcare services. Over the last four years, a distinguished team of physicians, scientists, engineers, builders, and architects in Seattle have been researching ways to improve healthcare facilities. From this collaboration, an important new approach has emerged.

Our proposal is to radically improve access, quality, and the cost of healthcare by introducing a new kind of healthcare *facility*—and to directly affect the economic recovery at the same time. Everyone agrees that reforming healthcare is critical. No one is proposing, until now, that a new kind of facility could catalyze and underpin important changes in overall healthcare costs and quality. The nation needs a kind of facility that can be sited rapidly into neighborhoods and easily adjusted to provide the care that local communities and chronic patients need.

We are proposing a new vision of accessible healthcare delivery.

Uncovering a Surprising Opportunity

CareCyte has discovered that the facilities in which medicine is practiced, and the way that they are designed and built have a great deal more to do with healthcare access, cost, and quality than anyone has previously reported. In regular accounting terms, the very special facilities required for the practice of modern medicine account for only 15% of healthcare costs.

When we looked more deeply, we saw that the common sense about healthcare in the U.S. today is limited and distorted by obsolete methods of designing, constructing, and operating healthcare facilities. The costs of the facilities themselves are dwarfed by the ways that the facilities shape and constrain the quality and efficiency of services delivered in them. Poor design processes and expensive, time consuming construction methods have repercussions throughout the healthcare system.

A ‘modern’ hospital typically takes 4-10 years from idea to operation and costs 3-10 times more than an office building – from \$800 to \$2,000 per square foot for a first-class facility. Hospital administrative and medical staffs are continuously distracted by construction projects and many hospitals have all of their discretionary resources tied up in construction and construction overruns. One doctor referred to their never-ending construction project as “...the hole into which all our money goes.” Once the facility is complete, those working in it must ‘make do’ with what the architects and builders left behind—including immovable pillars, core areas, and utility chases. Today, intradepartmental functioning, interdepartmental interactions, and patient flows are all organized around these constraints.

People tend to blame doctors and administrators for these failings, but healthcare institutions cannot afford to experiment with new ways to organize the flows of their work given their rigid structures. Changing anything significant in a working healthcare facility is enormously difficult, costs a great deal more than the original construction, takes many months or years, and is literally dangerous to patients. Dust, displacement, workmen, and construction in the middle of a hospital are more than inconveniences. Patients have to be moved, isolated, and protected. Staff must detour around repair and construction areas.

The great hospitals of our cities and academic institutions (the larger institutions with hundreds of beds, around which modern medicine has been organized) should be repurposed to specialized care for the very sick (tertiary and quaternary care). Those buildings are not well-suited to the primary care and prevention that is so needed, nor to the chronic care that puts much of the economic burden on the healthcare system.

Traditional buildings are impossible to keep as clean as they need to be for good medicine. For example, with the exception of the areas immediately around operating tables, and a few other places in some of the most expensive hospitals, air flows are organized the same way they are in office buildings. Everyone in the building—healthy and sick alike—shares the same air and the same pathogens.

The processes of designing, building, and maintaining healthcare facilities are complex, demanding, expensive, and time consuming. Healthcare institutions, architects, and builders – the people responsible for that work – assume that the delays and costs must be endured, as nothing else appears possible. Architects, for example, spend many years learning how to successfully navigate these processes. The navigational skills they develop become part of their identities and how they make a living, so they are vested in continuing outdated processes. All the parties, including the doctors and patients who for the most part do not participate in design of facilities, are locked into old, inefficient ways of working, often without even realizing it. Finally, tragically, new facilities are medically obsolete long before they open their doors; the field is moving too fast. Generally accepted accounting does not recognize most of these important hidden costs that universally burden our healthcare system.

A Facilities-Centered Proposal to Transform Healthcare Service Delivery

We propose a dynamic new design for the 21st Century healthcare facility. Our objective is to implement a flexible new platform for expanding access to and optimizing clinical medicine in America, and to cut one of the major sources of healthcare costs and poor quality – the way that healthcare service delivery facilities have been designed, constructed, and operated. All told, our designs can cut 60% or more from the cost of healthcare facilities². Once implemented, we believe our approach will catalyze a wholesale transformation of U.S. healthcare services.

Within two years of taking office, the Obama Administration could have in operation many hundreds of new, attractive, efficient and safe healthcare facilities throughout the U.S. addressing the diseases that put the largest burden on the U.S. economy, including diabetes, end-stage renal disease, cancer, and chronic heart disease. New facilities would be targeted to increase access to services and simultaneously lower treatment costs for these diseases. Others would be targeted to primary care and ambulatory surgical services.

Given the current lead times for hospital design and construction, to a large extent the sites, staffing, and funds for new facilities are already available or have already been budgeted. The challenge will be switching from costly traditional facilities to less expensive, reconfigurable high-tech facilities, built with today's best manufacturing practices, and delivered with much shorter lead times.

Once these new facilities are in place, it will become possible to radically improve the way that services are organized and delivered—rapidly and at low costs. Through those changes it will also become possible to further reduce healthcare *operating* costs by 40% or more³.

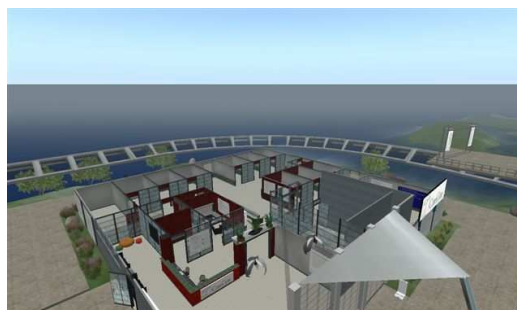
In addition to making a profound impact on the access, cost, quality, and future of healthcare in the U.S., what we are proposing would also produce economic benefit and help an Obama-led recovery.

The CareCyte Facility

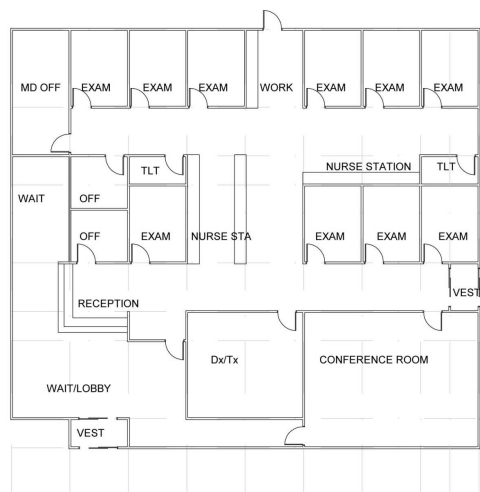
The proprietary class of high-quality facility that we have invented is safer, less expensive, quickly reconfigurable, and can be delivered in 4-10 months rather than 4-10 years.⁴ Scalable from 6,000 to over 150,000 square feet in one to four stories, our facilities are suitable for applications ranging from ambulatory care centers to clinics to full-scale acute care and surgery centers.



As an example, the 6,000 square foot community clinic shown in the illustrations can be delivered for under \$3,000,000 in less than 10 months⁵, including design, construction, and utilities. CareCyte facilities are built of steel and plastic, are easy to clean and will not harbor pathogens⁶. Interior walls are moveable so that practitioners and administrators can easily and rapidly reconfigure their spaces and working practices.



These cost effective buildings can be deployed quickly and unobtrusively into neighborhoods or neighborhood retail centers, similar to neighborhood fire stations. The facilities can be given a look and feel that ranges from luxurious to utilitarian, and can fit in any neighborhood. Technologically sophisticated, they will be networked to bring access to the most current medical practices and healthcare information, bringing outstanding and economical health care services to neighborhoods everywhere.



Our innovative approach to organizing the work inside the facilities was developed and tested in California's demanding healthcare environment, where the approach demonstrated the capacity to reduce building footprints and staffing requirements up to 40%.⁷

CareCyte's basic designs were developed in collaboration with a distinguished team of physicians, scientists, engineers, builders, and architects from Seattle, including 2001 Nobel Prize recipient Lee Hartwell, PhD⁸, President and Director of the Fred Hutchinson Cancer Research Center, Research Professor of Genetics with the American Cancer Society, and Professor of Genome Sciences at the University of Washington, and Dr. Richard Satava⁹, Professor of Surgery at the University of

Washington, and Senior Science Advisor to the U.S. Army Medical Research and Materiel Command. The Seattle Science Foundation convened the study group that led to the innovative designs.¹⁰

These facilities will provide a platform for medical professionals to generate the high level of innovation that we must have in our healthcare system going forward. Today's U.S. healthcare facilities illustrate Winston Churchill's warning: "We shape our dwellings, and afterwards our dwellings shape us." A new approach to building facilities will lead to a reshaping of the entire terrain of healthcare in the U.S. and give us, and our children, a healthier future.

Revolutionary Healthcare Benefits

We call the approach we are proposing a ‘radical innovation’ because an apparently simple set of actions have the ability to improve many critical aspects of modern healthcare service delivery in a profound way. We expect our approach to catalyze beneficial systemic changes, including the following examples:

1. *Greater access to quality healthcare in underserved markets:* A significant proportion of the population does not have good access to quality care—middle class, poor, and sometimes even the wealthy, in rural, suburban, and urban settings. A great number of people do without certain care, accept poor care, or travel significant distances to get needed care elsewhere. With the CareCyte technology, sophisticated facilities can proliferate in neighborhoods and communities, making quality healthcare more accessible.
2. *Quality healthcare for warriors:* Instead of struggling to provide quality medical services in tents, trailers, and obsolete buildings, the DOD can now have flexible, rapidly-deployable, safe, high quality medical facilities to take care of soldiers in the field and at home—something it has sought for a long time.
3. *Capacity where and when it is needed:* The U.S. can ill-afford the large number of new and remodeled facilities that will be required to address the coming surge in demand as baby boomers enter end-of-life. CareCyte's approach will allow healthcare providers to build capacity as needed not only for baby boomers, but also for temporary surges from pandemics and natural disasters that today would overwhelm the system. We can anticipate a significant surge from adopting universal health care. Massachusetts has recently discovered a side-effect of their universal health care: growing waiting lists for appointments with primary care doctors. Our proposed facilities can be rapidly deployed where and when additional capacity is needed, and at a much more affordable cost.
4. *Wiser use of scarce resources:* CareCyte's methods of design, manufacture, and assembly are so fast and efficient that it becomes less expensive to purchase a new facility of higher quality that will also be much more economical to operate than to remodel or expand today's aging facilities. This allows healthcare providers to allocate scarce resources to facilities that can provide the most effective care rather than continue to invest in sub-optimal renovations of existing structures.
5. *Operational productivity:* Projected healthcare staff shortages throughout the country can only be addressed by new staffing models; there is no way to train enough doctors and professionals to meet the demand. As cited above, our work has demonstrated that in the right kind of flexible facility with redesigned work practices, it is possible to deliver the same levels of service with 40-50% fewer staff per patient discharge.¹¹
6. *Leverage medical expertise:* With the advance of medical information and communications technology, more and more specialists are able to support attending professionals at long distance—interpreting images, clinical lab results, the pathology of infectious disease, managing complex cases, and even doing surgery. Our facilities are designed to accommodate the special requirements of networked medicine. They come fully wired, enabling adoption of modern electronic records, billing, accounting, and compliance systems. They will provide a universal standard foundation for networked medicine, in the U.S. and eventually throughout the world.
7. *Agile adaptation to new technology:* Fast, easy, and cost-effective reconfiguration of CareCyte's facilities will allow healthcare providers to accommodate new technology and different

services as needs and best practices change. That is impossible in current structures. There are many new technologies on the horizon for improving medical care, patient satisfaction, and reducing healthcare costs in the U.S. For example, molecular medicine is an important emerging wave in medical technology that will require hospitals to reconfigure work spaces in as-yet unknown ways. CareCyte facilities will not become obsolete with new technology; existing structures will.

8. *Minimize dangerous hospital-acquired infections:* Drug-resistant infections are now a significant cause of death in the U.S., and are often acquired in our hospitals. Old facilities and facilities built in the traditional fashion play a large part in this problem. Even the most careful practices cannot eliminate many of these infections. The pathogens become embedded in the building and travel freely through HVAC systems. CareCyte's facilities combat hospital-acquired infections through very special airflows and through the cleanable materials with which they are constructed, making them much safer.

Our claim that facilities can play so pivotal a role in shaping a shift in the direction of an industry may elicit skepticism. Consider, however, the role played by computers, networks, and communications technology over the last decades. In many industries including financial services, travel, and retailing, these technologies have inspired and catalyzed many radical changes. Remember as well the influence new technologies had in the Obama-Biden campaign. Similarly, we envision that inexpensive, readily-available, safe, flexible, high quality, networked healthcare facilities will underpin and catalyze revolutionary improvements in healthcare delivery in the U.S. and the world at large.

Our Proposal: Mobilize Quickly

We recommend investing a modest amount to move quickly to deploy this important new technology, working first where support for the change will be strong:

1. Immediately begin construction of 6-12 initial sites for the Department of Defense (DOD), aimed at care of U.S. servicemen and women in and coming out of Afghanistan and Iraq. The DOD is not subject to the same regulations of state and local governments that supervise the design and implementation of healthcare facilities, and hence can move rapidly without the constraints found in other jurisdictions. We believe that this initiative could be extended to include the Veteran's Administration (VA) and thereby produce additional benefits.
2. Work with established public and private health care providers to implement another 6-12 initial installations in rural, suburban, and urban settings in Washington State, home to this invention and its inventors, where we expect it would be rapidly embraced.

Simultaneously, set up a rigorous study of the validity of the proposition that this new class of facility can catalyze the changes we claim, based upon these samples in public and private domains. This will be important for bringing widespread support for this innovation. Have the study report to a top political official without vested interests in the current healthcare establishment. Involve groups that will be interested in the results and process of the study, including hospital administration innovators, thought leaders, and the Centers for Medicare and Medicaid Services (CMS). Observe how the approach affects chronic care costs, supports a shift to prevention, affects other cost reductions, and affects access, personnel, and productivity.

Once the initial installations are established and the study begins to report results, follow with waves of distributed installations in hundreds of strategic locations throughout the nation, and in locations where the DOD (and optionally the VA) have the greatest need.

With seed money and political support from the Obama Administration, modest preparation and planning, and a small management team to coordinate the efforts, these new healthcare facilities can be designed, manufactured, and deployed so rapidly that within 2 years several hundred new attractive, flexible, efficient and safe healthcare facilities could be in operation throughout the U.S.

Next, we would involve major U.S. institutions with manufacturing and logistical capacity (e.g., one or more of the major automobile or aircraft companies, and the DOD) to assist in this effort. At that point, there is no reason why *thousands* of new facilities could not be customized, manufactured, and installed, and a large proportion of them brought to operation rapidly—providing improved care for millions of Americans after only a few years. An analogy, of course, is the mobilization of the country to produce ships and aircraft for World War II. These additional facilities would provide the foundation for a wholesale revolution in healthcare in the U.S., exactly on time to address demands from baby boomers and others that would otherwise overwhelm our current healthcare system.

The proposal we are making is going to produce a large impact with a small amount of capital.. For example, a relatively modest investment in the range of \$1-500 million would draw \$5-10 billion or more in capital investments over the next couple of years, aimed at new, trailblazing healthcare service delivery across the nation. That alone will change the future of healthcare, but the leverage is greater than that. Those capital investments will produce a new distributed platform of facilities in which healthcare services will begin to be delivered, each year, in values equivalent to the amount of the capital investment. At the same time, even in the beginning, the investing and operating institutions will realize 30-60% improvements in efficiency (per-patient service costs) as a result of the quality of the facilities. In other words, the costs of operations in those facilities could be cut more or less in half, or, the facilities could serve twice as many patients.

Contribute to the Economic Recovery

In addition to many healthcare benefits, our proposal could significantly help the economic recovery. Three likely economic effects are:

1. Deploying these facilities provides a way to spend construction dollars that will produce quick returns in an important part of our national infrastructure. This capital spending will produce a multiplier effect, drawing additional capital investments and generating many jobs in the construction and healthcare industries, and in the industries that supply them.
2. In the coming restructuring, U.S. automakers will have to either shut down or find new uses for plants. (There are no obvious, important new uses on the immediate horizon.) CareCyte facility components¹² are manufactured with many of the same computer-controlled rolling, stamping, milling, and shaping processes used for the manufacture of automobiles. Thus, the components of CareCyte facilities could easily be manufactured in many automotive manufacturing plants, rescuing fallow assets and improving the economic position of companies, workers and the country overall..
3. The manufacturing, deployment, and assembly aspects of this new generation of healthcare facilities will provide opportunities for retraining and gainfully employing large numbers of workers from many industries, particularly including the hard-hit automobile and construction industries.

Next Steps

Please contact Chauncey Bell, CareCyte Chief Operating Officer, at 510 717 0183 or cb@carecyte.com if you would like to explore this proposal, talk to some of the leaders who developed the innovations, or to get an in-depth presentation about the facilities and their advantages.

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CareCyte Credentials

Our principals have over 100 years experience in healthcare design and construction—the design of healthcare facilities and medical practices, construction engineering, construction, and growing and leading companies providing medical services. Our team has brought important innovations in construction engineering, process manufacturing, healthcare architecture, information technology, and process design. Relevant projects and clients include Sutter Health in Northern California (more than \$6 billion in capital projects), Virginia Mason Medical Center (Seattle), Cedars-Sinai Health System (Los Angeles), the Experience Music Project (Seattle), many other large-scale building projects, and leadership in developing of one of the world’s largest kidney dialysis providers. Our website provides information about our approach, the medical origins of our company, and the backgrounds of our principals: <http://www.carecyte.com>.

Testimonials

The following testimonials were written by people familiar with our innovation who are well-respected and knowledgeable in the healthcare field.

“I am convinced that the problem that CareCyte is attacking is central to the challenge of providing better, more accessible, and less expensive health care in this country and on the planet. The current methods of designing and building health care facilities have profoundly negative effects on the quality of interactions of doctors, healthcare professionals and patients, on the way that healthcare professionals go about planning services, and on the economic situations and balance sheets of healthcare institutions across the country.”

Greg Foltz, MD
Director, Neurosurgery International
Swedish Neuroscience Institute, Seattle, WA

“I am writing in strong support of the efforts of the CareCyte organization to deliver a new kind of healthcare facility, at significantly lower cost and with improved efficiency.”

Michael P. Birt, PhD
Director, NBR Center for Health and Aging
Executive Director, Pacific Health Summit, Seattle, WA

“Their work will support development of an innovative new kind of health care facility that will allow rapid deployment of new technology in rural and underserved environments.”

Andrew Wright, MD
Assistant Professor
Department of Surgery
University of Washington Medical School, Seattle, WA

“My experience as President of the Fred Hutchinson Cancer Research Center has convinced me that the problem CareCyte is attacking is central to the challenge of providing better, more accessible, and less expensive health care in the developing world.”

Lee Hartwell, PhD
President and Director
Fred Hutchinson Cancer Research Center, Seattle, WA

“They have invented a new way to create large spaces (buildings) which are reconfigurable, cost effective and quick to construct. By using some of the latest large-scale manufacturing technologies, CareCyte is able to manufacture higher quality at lower cost – the essence of Information Age manufacturing.”

Richard Satava, MD, FACS
University of Washington, Professor, Department of Surgery
Senior Science Advisor, U.S. Army Medical Research and Materiel
Command

1 These efficiencies result from (1) efficiencies from computer-aided design and manufacturing techniques, (2) radically more efficient use of materials, and (3) reductions in footprint size based upon significant workflow improvements.

2 See footnote #1.

3 From research conducted at Sutter Health, in work under the supervision of David Chambers, who serves as their Director of Planning, Architecture, and Design. See <http://www.sutterhealth.org/about/intro.html>. There is more information at <http://www.carecyte.com> about the methods involved.

4 Our approach is not a radical innovation in construction technology. All of the methods and materials we use have been tested and proven in various construction applications, although not in the particular combinations in which we use them. The only objections to deploying CareCyte healthcare facilities that have been raised are that they are too new, too untested, and do not follow the rules of the traditional game. These objections, of course, are those that are brought in response to any change.

5 Not including local permitting processes.

6 And constructed in a manner that is extremely energy efficient (using roughly 30% less energy than equivalent traditional buildings) and green: LEED Platinum and more.

7 See footnote #3.

8 See <http://www.fhcrc.org/about/leadership/hartwell.html>

9 Dr. Satava was the surgeon on the team that developed the first surgical robot, and developed the first virtual reality surgical simulators. For the past 15 years he has been at DARPA, and now U.S. Army Medical Research Command. (Lifeboat Foundation Biography.)

10 See <http://seattle-science-foundation.org/>

11 See footnote #3.

12 The components are subsequently shipped to the eventual site of each facility, where under most circumstances, the facility is assembled in less than a month.