# HMC HEALTH- CARE NEWS

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# Measure Twice, Cut Once:

## How Simulation Modeling is Changing Healthcare Design and Construction

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*"Wherever possible, you need to be able to assess the necessary flow of services and model the actual delivery of care. And often, you can't do that using spreadsheets. You have to be able to demonstrate it visually."*

Virtually every healthcare facility is faced with the need to rethink high-traffic areas where efficiency can literally mean life or death. Will a simple remodel do the trick?  Are new exam rooms necessary to deliver better care?  Does the hospital require additional exam rooms in the emergency department, or are additional inpatient beds needed to accommodate the current ED volume?  And of course, budget constraints underlie all of these decisions.

In the current economic climate, technology is increasingly at the forefront as a tool to help decision makers find the right choices for their patients and their staff without making costly physical changes that may not produce the desired results.  A recent IT solution being used in the architecture field – and one that is proving to save both time and money – is simulation modeling.

Even if a facility has not gotten to the stage where they engage an architecture or interior design consultant, staff and administrators will likely detect inefficiencies in the physical environment, particularly in areas where time is of the essence and patient volumes and needs are difficult to predict (such as emergency rooms or surgical suites).  They may decide to compensate by adding more physicians or nurses, or by repurposing rooms or building hasty add-on space, without examining the underlying inefficiencies that have, in effect, created logjams.

"If you push the balloon, it often pops out in areas you don't anticipate," says Jerry Eich, senior medical planner and healthcare practice leader at HMC Architects. "Wherever possible, you need to be able to assess the necessary flow of services and model the actual delivery of care. And often, you can't do that using spreadsheets.  You have to be able to demonstrate it visually."  The ability to add variables such as volume surges, for example, enable visualization of their impact throughout all the steps in the care delivery process.
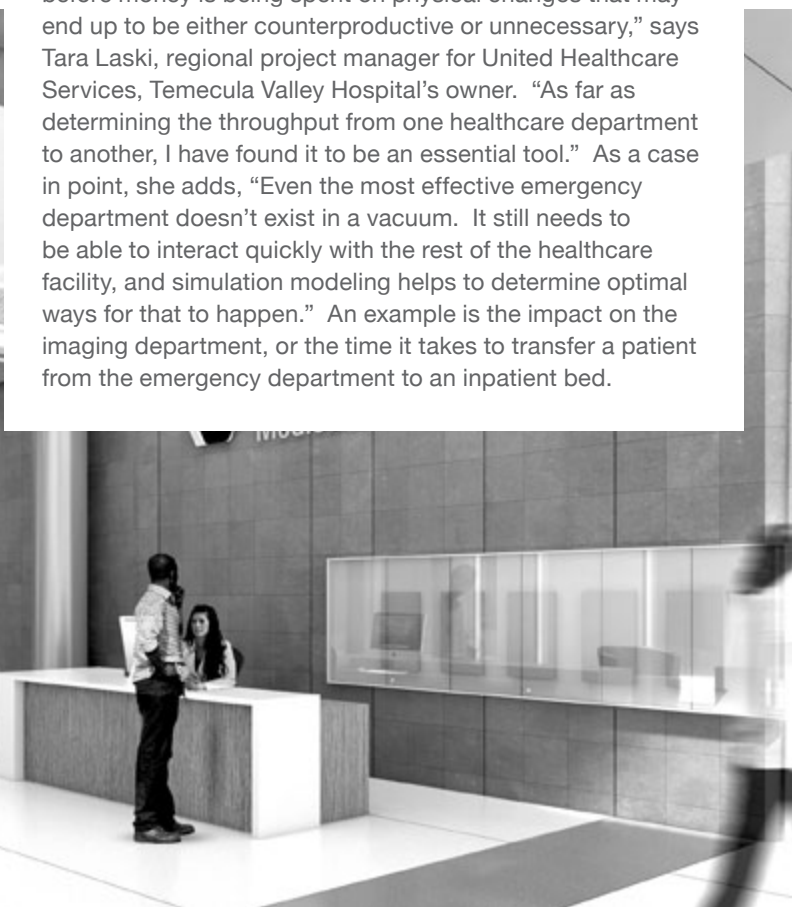
This is where simulation modeling takes center stage. New software, now available from a variety of vendors, allows designers to depict the critical relationships between medical departments and to identify where the delivery of care may be suboptimal. These simulations can assist hospital executives in determining priorities for physical changes before a single wall is moved or demolished. In easy-to-read depictions of floorplans and staff/patient clustering, simulation modeling helps both designers and their clients to see where inefficiencies exist – and then work together to correct them. It brings project management tools to the drawing-board in a way that is effective for client and planner alike. In some cases, the software indicates that process changes can be made without making a capital investment for design or construction – allowing architects to act as clients' business partners with or without architecture.

In Southern California's Temecula Valley Hospital, simulation modeling and systems analysis are being employed by HMC Architects and Empirical Solutions Corporation to provide an estimate 30 percent improvement in patient care and process efficiency. The simulation modeling approach acquires and assesses circulation flows up to peak hours, in both intra- and inter-departmental scenarios. It then will make recommendations based on client-identified priorities, competitor benchmarking, and projected future needs or growth.

"The real benefit of simulation modeling is that it allows [hospitals and designers] to work things out in a virtual way before money is being spent on physical changes that may end up to be either counterproductive or unnecessary," says Tara Laski, regional project manager for United Healthcare Services, Temecula Valley Hospital's owner. "As far as determining the throughput from one healthcare department to another, I have found it to be an essential tool." As a case in point, she adds, "Even the most effective emergency department doesn't exist in a vacuum. It still needs to be able to interact quickly with the rest of the healthcare facility, and simulation modeling helps to determine optimal ways for that to happen." An example is the impact on the imaging department, or the time it takes to transfer a patient from the emergency department to an inpatient bed.

*"Instead of lines on paper, you're showing the client shapes that relate to the actual environment that they experience on the ground."*

From the point of view of the hospital administrator who is faced with difficult decisions on how to optimize his or her budget, Laski observes, "You save money by investing in using technology to model the design before any construction drawings are created. Simulation modeling allows you to test the design before paying for any building or remodeling. It really makes the process of improving efficiency at your hospital much more intuitive for everyone concerned – including the designers or architects."

As part of a $360-million effort to reinvigorate the campus of the Martin Luther King Jr. (MLK) Medical Center in Los Angeles County, HMC Architects designed the renovation of an existing tower and a new multi-service ambulatory care center, both slated to open in 2012. Because operational shifts had spurred HMC's client to seek the architects' help, one of the first steps was simulation modeling. In addition to other data, figures on bed capacity, patient arrival patterns, lengths of stay, and wait times were collected and used to forecast areas where the hospital's program would best benefit from expansion or redesign to alleviate overcrowding. HMC was then able to create a set of variables representing physical changes that could be manipulated to demonstrate the effectiveness of particular design options.

"Instead of lines on paper, you're showing the client shapes that relate to the actual environment that they experience on the ground," says Donna Nagaoka, project manager for the MLK Hospital. "If you want to see the potential benefits of one option as opposed to another, you can use simulation modeling to do that in a way that is visual, easy to understand, and based on the facts that pertain to each facility's unique situation."

Even hospitals that are not planning renovation, remodeling, or new construction can benefit from simulation modeling. "What operational issues are you trying to solve?" is the question that Nagaoka recommends asking. If a hospital's systems and processes are not performing up to expectations, the trouble may not be the amount of space or the architecture per se – yet, by converting hard data into easy-to-understand visuals, simulation modeling can still help. And in the ever-evolving world of healthcare provision, it is never a bad idea to begin building a body of knowledge that will help to keep a facility on par with the curve when renovations, remodeling, or expansion eventually become necessary.

The old adage "measure twice, cut once" is especially apt when it comes to design and planning decisions that affect not just a hospital's bottom line, but its patients' quality of care. Simulation modeling may well be the new yardstick that enables the most accurate – and ultimately, cost-effective – measurements.

# Healthcare Goes Green

How High-Performance Architecture is Greening Healthcare

Healthcare facilities—hospitals in particular—have unique and intensive energy use requirements. In addition to lighting, heating, and cooling 24 hours a day, these facilities must also use energy for ventialtion, equipment, sterilization, laundry, and food preparation. This energy use is driven without comprise by a primary focus on patient healing. However, the resulting impact of this intense energy use to the infrastructure of surrounding communities drives an obligation by designers and owners to address the unique impacts of these project types, and to be accountable for a better alignment of both the built and natural environments.

According to a study by the Consortium for Energy Efficiency, lighting and HVAC account for more than 70 percent of a typical hospital's energy bill—and both areas present opportunities for significant savings. Recognizing the tremendous opportunity to design more smartly for energy savings while minimally impacting the natural environment, HMC Architects launched its High Performance Architecture (HPA) initiative in 2010, which aims to achieve a balance of site relevance and orientation, energy conservation, and the comfort and well-being of its occupants—all within the context of a client's parameters.

The initiative aligns with the recently unveiled LEED for Healthcare rating system from the U.S. Green Building Council (USGBC), which was developed to address the unique needs of 24-hour healthcare facilities, taking into account factors like process water use related to medical equipment, rural facility locations, specific patient requirements, and staff health.

According to HMC's Director of Architecture Pasqual Gutierriez, "HMC's High Performance Architecture Initiative goes beyond LEED and traditional 'green' design strategies to truly deliver high-performance architecture; that is, architecture that is attune with its surroundings, to the extent that there is no negative impact on the environment. High-performance architecture aims to advance beyond today's accepted guidelines and standards classifications and towards truly environmentally neutral design, employing three primary areas of measure in determining the success of a project: its environmental impact; human health; and economy."

*"HMC's High Performance Architecture Initiative goes beyond LEED and traditional 'green' design strategies to truly deliver high-performance architecture."*

Tier 1 of an HPA approach is delivered through a conscious implementation of carbon neutral strategies of site and building envelope design. Tier 2 is a collaborative response and integrated engagement of optimum engineering building systems without the compromise to the comfort of its inhabitants. Collectively, the HPA Tier 1 and Tier 2 approach provides a value inspired proposition to patient and staff well-being, client, and community constraints, all with respect to the environment.

*Learn more about how HMC's healthcare practice is designing facilities that are leading the industry for efficiency at http://archlab.hmcarchitects.com*

The building envelope being used at Torrance Memorial Medical Center, currently under construction, will help reduce the facility's energy consumption.

# Putting the Patient First:

A Q+A with Dirk Evans, Patient-Centered Care Director, VA San Diego Healthcare System.

As the patient-centered care director at the VA San Diego Healthcare System, Dirk Evans has worked diligently to implement patient-centered care principles throughout the system's facilities. Dirk has reached out to the international healthcare community, providing insights to the changes happening to care delivery in the U.S. and how medical groups around the world can implement patient-centered care principles.

*HMC Healthcare News* recently sat down with Dirk to discuss his thoughts on patient-centered care principles and how they are being implemented at VA facilities in San Diego County.

**HMC: The VA health system is known for safe, efficient, and digitally driven care with the veteran at the center. Can you discuss where the healing environment plays a role?**

Evans: The environment is essentially "the stage" that all healthcare interactions take place on. It literally is where the patient experience is played out so to speak. We tend to typically think of it in terms of colors, floor covering, window treatments, ceilings, and artwork – the right brain part of the healing environment. Those are the aesthetic qualities and are beyond doubt crucial pieces in creating a healing environment.

Equally important, and the part we need to start with in creating the healing environment, is considering what needs to happen in that space – the left brain part of the healing environment. Similar to a kitchen work triangle, this is where the importance of working with the users of the space can't be understated. This is where we need to ask questions like:

- Does the space support or hinder the flow of work that needs to occur in it?

- Does the design take into consideration step-by-step processes?

- If we work with the customer to create a spaghetti diagram of work to occur in the space, would it demonstrate efficiency or extra steps and re-work?

*"The environment is essentially 'the stage' that all healthcare interactions take place on."*

PATIENT FIRST

Healing gardens at VA San Diego Medical Center offer respite from the bustling activity of the hospital.

*"A veteran can show up at any VA facility and their records at previous facilities are instantly accessible to facilitate the best possible continuity of care providing as much patient safety as possible in the process."*

When these questions are appropriately addressed, the safety, efficiency, and support of digital technology can be realized to their ideal or target state in space designs. The reason we want to achieve that state is to minimize frustration and have "the system" make sense to the veteran patient, as well as healthcare providers. This is how we keep veterans in the center of the work we do. Our veteran patients are the reason we are here. If the environment isn't designed to maximize productivity, the resulting frustration and energy spent developing work-around solutions by users can supersede where our primary focus should be—on the patient experience.

Theoretically this has been the goal with our facility. Over time, demand for the care we provide has shifted in both model of delivery and volume. As we respond to that demand we have partnered with Planetree, the internationally recognized leader in patient-centered care, to really maximize our responses to be as patient-centered and efficient as possible.

**HMC: As health technology advances, are you making necessary improvements in your facilities to accommodate those technologies? Are you providing "best in class" technology for veterans in order to keep up with the private sector?**

Evans: Today's VA always strives to provide "best in class" technology for veterans, and yes, we do keep up with the private sector. Sometimes we lead those advances and sometimes we recognize them and adapt to them as rapidly as possible. Two examples of this are the electronic medical record and robotic surgery. The VA has the best electronic medical record available. A veteran can show up at any VA facility and their records at previous facilities are instantly accessible to facilitate the best possible continuity of care providing as much patient safety as possible in the process. This digital record was developed in house.

Additionally, San Diego is a national pilot site for an electronic medical record exchange for veterans whose care is co-managed by private sector providers. This allows accessibility for providers outside the VA to see select medical information of patients who opt to turn this feature on in their electronic record. Lastly, San Diego has also been selected as a developer for the next generation of electronic record called VLER—Virtual Lifetime Electronic Record. Current design work involves making sure veterans and their families have space to access their medical record as they choose.

*"The VA continues to either lead the way or rapidly adopt new technologies. We work with designers to accommodate those improvements we adopt as well as pre-plan with a vision for technologies we know are on the way."*

When robotic surgery for certain procedures proved safer and more effective, VA San Diego leadership surveyed providers who recommended we purchase a surgical robot and implement its use in those procedures. Leadership then approved the purchase of robotic surgery technology and implemented it into indicated surgical routines. The VA continues to either lead the way or rapidly adopt new technologies. We work with designers to accommodate those improvements we adopt, as well as pre-plan with a vision for technologies we know are on the way.

HMC:  How do you provide space for veteran's young families in your facility? What about activities for young children as they wait for their parent during treatment?

Evans: Younger families are somewhat of a newer phenomenon with today's veteran patients and we are adapting to accommodate them. Our facilities currently have patient lounge spaces, some of which accommodate children well. Other areas are being remodeled with younger families in mind. Our Voluntary Services Department has done a good job of providing books, crayons, children's furniture, and toys, and we are in the process of doing more. One way to accommodate families is make sure our design teams include patient users as part of the team. This is a newer process for us but our teams are adapting. Including patient input in design is crucial to succeeding in meeting their needs. It's too easy to assume we know what patients want and get it wrong.

This approach also envisions empowering staff to communicate recognized needs and facilitate the process of change. One example of this is in our Spinal Cord Injury unit where staff recognized an increase in patients with younger families that needed changing tables for infants. Staff identified a need and quickly set about the process of identifying the space and facilitating its modifications to meet patient and family needs.

HMC: Is there a stigma of the "VA" for younger vets? How do you address that from an organizational standpoint? How does the image of your facility appeal to younger vets?

Evans: There may be a stigma of the "VA" for younger vets entering our healthcare system for several reasons, which include unfamiliarity with a new healthcare system and it's processes and providers, historical perspectives, and confusion from misunderstandings presented by the press. For example, veterans spend anywhere from a few to 20 years or more receiving healthcare in the DOD system. Transitioning to a new system can be confusing with many unknowns. Additionally, the VA healthcare system has been lumped together with the DOD system, which has had some challenges, as witnessed by recent press from Walter Reed Army Hospital. In reality the systems are two separate organizations—DOD and Veterans Healthcare Administration (VHA).

To address this from an organizational standpoint we have implemented a number of approaches. We have veterans' transition advocates with offices on bases to facilitate smooth transitions. We intentionally facilitate "Muster" events on base and at the hospital to assist transitioning veterans in becoming familiar with our process, facilitate "One Stop" appointment strategies, and connect them with advocates that can help them navigate a new healthcare organization. We also conduct Focus Groups to hear what our patients want. Responding to Focus Group information, we have implemented a Facebook page and Twitter account, and have begun developing strategies to utilize them as means of communicating with a multi-generational patient demographic. Additionally, we have recently implemented secure text messaging between patients and providers.

In regards to overall image and appeal to younger vets, as facilities remodel we are doing so with input from veterans related to design and what they would like in their hospital and healthcare settings. We are being as efficient as possible in all aspects of how we design our facilities and processes to best meet patient needs.

HMC: How does the VA San Diego address veteran's spiritual needs in the healing environment? Are there quiet meditation areas?

Evans: VA San Diego has a robust Chaplain program to meet veteran needs. This program includes a dedicated multi-faith chapel, as well as the availability of clergy to offer support for a multitude of beliefs. As we continue to remodel and build new facilities, a provision for quiet meditation areas is one of our criteria in developing new spaces.

Approximately a year ago we worked with Planetree's in-house architect to develop a tool to apply in developing new projects. The tool encompasses all of Planetree's Patient-Centered Care Principles. Planetree's architect facilitated the process to prioritize which components most emphasized VA San Diego's organizational character. As a group we determined the aspects of care delivery that were most important to us, then determined how much each component played a role in that aspect. When we develop new projects we refer to the tool to guide us in meeting our design goals that reinforce our organizational characteristics. Addressing spirituality and spiritual needs is an area that we determined was important to us. The process is newer to us and we are working at hardwiring it into our design and project development procedures. This is becoming the way we do things from here forward.

*HMC Architects is currently working with the VA San Diego on Halls and Walls, Second floor Psychiatric Expansion, and Fifth floor Master Plan Study. HMC is one of only five firms in the world to be a founding member of the Planetree Visionary Design Network and remains committed to the principles of patient-centered care in all of its healthcare projects.*

# AIA/AAH
# Unbuilt Award

First People's Hospital, China, honored as one of three
winners in the 2011 AIA/AAH Annual Design Awards

*HMC Architects is honored to be the
recipient of the 2011 AIA Academy of
Architecture for Health Unbuilt Award
for the design of the First People's
Hospital, China. The award was given
July 30, 2011 at the AIA/AAH Summer
Leadership Summit in Chicago.*

HMC Architects is honored to be the recipient of the
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Award for the design of the First People's Hospital,
China. The award was given July 30, 2011 at the AIA/
AAH Summer Leadership Summit in Chicago.

In 2009, HMC Architects teamed with China-based Shunde
Architectural Design Institute to compete by invitation with
five short-listed teams from around the world to win the
design competition sponsored by the Chinese government.
The team's design integrates Eastern medicine and
culture with Western innovation in healthcare planning
and design. When complete, the project will total 225,000
square meters (2,420,000 square feet) on 33 acres,
house 2,000 hospital beds, serve 6,000 outpatient visits
per day, and accommodate 2,000 parking spaces.

The design combines a precise organization of forms linked
by a dynamic spine element that forms a grand interior
promenade, and 'eco-atrium' connecting and harmonizing
the elements of the hospital. The tower marks the main plaza,
and building heights step down towards the edge of the
site to maximize views. The spine and tower work together
to organize the site into four distinct zones. At the point
where the spine passes through the main tower building, an
iconic opening creates a symbolic heart for the campus.

The First People's Hospital is currently under construction
and estimated to be completed April 2012.

*The Academy of Architecture for Health's mission is to improve
both the quality of healthcare design and the design of healthy
communities by developing, documenting, and disseminating
knowledge; educating design practitioners and other related
constituencies; advancing the practice of architecture; and
affiliating and advocating with others that share these priorities.*

# Grand Opening
Providence Holy Cross Medical Center

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Providence Holy Cross Medical Center in Mission Hills, Calif., along with HMC Architects and Swinerton Builders, celebrated the opening its new $180 million South Tower Expansion on Wednesday, July 13, 2011.  The new four-story, 138-bed patient care wing is among the first inpatient hospitals in California to apply for LEED Silver Certification, recognizing the hospital's commitment to sustainable design, construction, and operation.

The new tower includes a modern new entrance, lobby, chapel, kitchen and dining facility, and a women's services department with 10 LDRP rooms, 11 new post partum rooms, 2 C-section operative delivery rooms, and a 12-bed newborn nursery.  Within hours of opening, the center was put to the test as the first newborns were delivered.  The addition also includes 105 medical/surgical beds that have been added to the campus, along with 3 GI/endoscopy procedure rooms with a 10-bay recovery area.  A 12-bed neo-natal intensive care unit will open this fall.

All private patient rooms are identical to facilitate the safe delivery of care.  Patient care units are supported with a centralized nurse's station for common tasks as well as decentralized nurse work areas to allow nurses to be closer to their patients.  The new facility supports the best of current care delivery practices and features new methods of delivery that are effective, efficient, and respond to patient and caregiver needs.



*Providence Holy Cross Medical Center in Mission Hills, Calif., along with HMC Architects and Swinerton Builders, celebrated the opening its new $180 million South Tower Expansion on Wednesday, July 13, 2011.*

→ Banner Lassen Medical Center, Emergency Department Renovation, Susanville, CA

Brown Hand Center, Denver, CO

California Life Properties Aurora Psychiatric Hospital Addition, San Diego, CA

Desert Parkway Psychiatric Hospital, Las Vegas, NV

HCA/Riverside Community Hospital ED, Riverside, CA

Kaiser Permanente, Moreno Valley Community Hospital, Iris Medical Office Building II, Moreno Valley, CA

Kaiser Permanente, San Marcos, Medical Office Building, San Marcos, CA

Kaiser Permanente, Sand Canyon, 120-bed Infill, Irvine, CA

Loma Linda University Medical Center, Hybrid OR, Loma Linda, CA

Pascua Yaqui Health Clinic, Phoenix, AZ

Rady Children's Hospital San Diego, Kitchen Remodel, San Diego, CA

Scripps Mercy Infusion Building Remodel Project, San Diego, CA

Seton Medical Center, New Patient Tower, Daly City, CA

Universal Health Services, Temecula Medical Center, Temecula, CA

Universal Health Services, Summerlin Surgery/Radiology Renovation, Las Vegas, NV

University of Southern California, Doheny Eye Institute Renovation, Los Angeles, CA

VA San Diego Psychiatric Center Expansion, San Diego, CA

VA Central Valley, Seismic Upgrade, Fresno, CA

VA Sierra Nevada Health Care System, Specialty Clinic Building, Reno, NV

VA West LA, Mental Health Building, Los Angeles, CA

## World Sustainable Building Conference
October 18–21, 2011 // Helsinki, Finland

The aim of the World Sustainable Building Conference in Helsinki is to share leading knowledge, and also to find new solutions which can enhance sustainable ways of living and working within built environments. HMC's Director of Architecture Pasqual Gutierrez and Director of Sustainable Design Dr. Pablo La Roche will be presenting the Frontier Project.

## Planetree Annual Conference
November 2, 2011 // Nashville, Tenn.

*Catching the Wave: Designing for the Future State of Patient-Centered Care*

Navigating the muddy waters of creating patient-centered healing environments can leave one feeling as if they are in the soup. Intuitively, we know that design approaches that facilitate the Planetree philosophy are environments that enable a culture of kindness, empathy, and human interaction to flourish. However, there is no "one size fits all." Join  Kimberly Montague, Rebecca Hathaway, and HMC's Jerry Eich as they discuss future trends in health care design and how to consider hi-tech solutions and hi-touch experiences.

## ASHE 2012 International Summit and Exhibition on Health Facility Planning, Design, and Construction
March 4-7, 2012 // Phoenix, Ariz.

Save the date and be sure to visit HMC's booth at the 2012 ASHE PDC Summit.

# SPEAKING ENGAGEMENTS

# CONTACT HMC'S HEALTHCARE TEAM

Since 1940, HMC Architects' timeless and functional designs have impacted communities across the Western United States. HMC is one of only five firms in the world to be a founding Member of the Planetree Visionary Design Network, reflecting its understanding of the effect design has on the healing process. The firm is consistently recognized by *Modern Healthcare, Healthcare Design*, and *ENR* magazines as a national leader in healthcare planning, design, and construction administration. HMC is honored to be the recipient of the 2011 AIA Academy of Architecture for Health Unbuilt Award for its design of the First People's Hospital, China.

To contact one of our healthcare design and operational experts, please find a relevant leader below, or call 800-350-9979.



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