

# **The San Diego Center for Patient Safety: Creating a Successful Community based Research, Education, and Service Consortium**

Nancy Pratt, Kelly Vo, Theodore G. Ganiats, Matthew B. Weinger

## **Abstract**

In response to the Agency for Healthcare Research and Quality's Developmental Centers of Education and Research in Patient Safety grant program, a group of clinicians and academicians proposed the San Diego Center for Patient Safety (SDCPS). The Center is remarkable not only because of the original group's diversity, but also because few members knew of their common interest. In its two and a half year history, the Center has grown to over 100 members from 20 disciplines, sponsored two countywide safety conferences, catalyzed the creation of a consortium of the local healthcare systems, and performed innovative research. While the breadth and depth of local expertise contributed to our successes, there were many roadblocks. This paper describes the creation of SDCPS and its affiliated organizations, addresses the challenges of establishing a community patient safety collaborative, delineates some obstacles to long-term success, and presents some of the lessons we have learned from this endeavor.

## **Introduction**

Over the last decade, the issue of health care quality in the United States has been closely examined and scrutinized. Serious and widespread quality problems exist as exemplified by the underuse, overuse, and misuse of services and by the variability in patient management.<sup>1</sup> The 1999 Institute of Medicine (IOM) report *To Err is Human: Building a Safer Health System*<sup>2</sup> brought to the forefront a growing body of evidence that raised troubling questions about the

safety of our health care system. Among other proposed actions stemming from this growing public awareness, it was suggested that health care systems should work together to improve patient safety and health care quality through, for example, data sharing and collaborative initiatives.<sup>3</sup>

Catalyzed by the Agency of Healthcare Research and Quality's (AHRQ) proposed support for "Developmental Centers of Education and Research in Patient Safety" (DCERPS), a group of academicians and clinicians in San Diego, California, came together in the Fall of 2000 to discuss the possibility of such a research and educational collaborative. Out of this meeting of about a dozen people, many of who did not know each other or who had little experience in patient safety, grew the San Diego Center for Patient Safety (SDCPS). Only three years later, SDCPS now consists of over 100 individual members from 20 different disciplines and seven distinct San Diego health care delivery system members. Furthermore, it encompasses 18 hospitals that together care for most of the county's 3 million people.

In San Diego's DCERPS grant, funded in September 2001, we proposed to develop and refine research methods to facilitate the study of patient safety at the point of care. However, in contrast to traditional research grants, the inherent structure of the DCERPS program also encouraged multidisciplinary team building, collaboration with health care delivery systems, and patient safety education. This led to an important expansion from the original academic orientation of SDCPS to a substantive effort to establish relationships with, and support the patient safety activities of, the San Diego community's health care delivery systems and practitioners. As a result, SDCPS has embarked on a range of patient safety research, education, and service initiatives. Furthermore, SDCPS has been instrumental in the creation of a separate consortium of unaffiliated health care institutions that have begun to work together to share

critical safety information and to undertake collaborative patient safety projects. This paper describes the creation of SDCPS and its affiliated organizations, addresses the challenges of establishing a community patient safety collaborative, delineates some obstacles to long-term success, and presents some of the lessons we have learned from this endeavor.

## Laying the groundwork

The DCERPS program was part of AHRQ's effort to expand the national patient safety infrastructure. San Diego's DCERPS, which led to the creation of the SDCPS, was one of the eighteen developmental centers funded. Initially, we focused on defining a patient safety research and education agenda and building an organizational infrastructure to support those goals.

## Building a multidisciplinary team

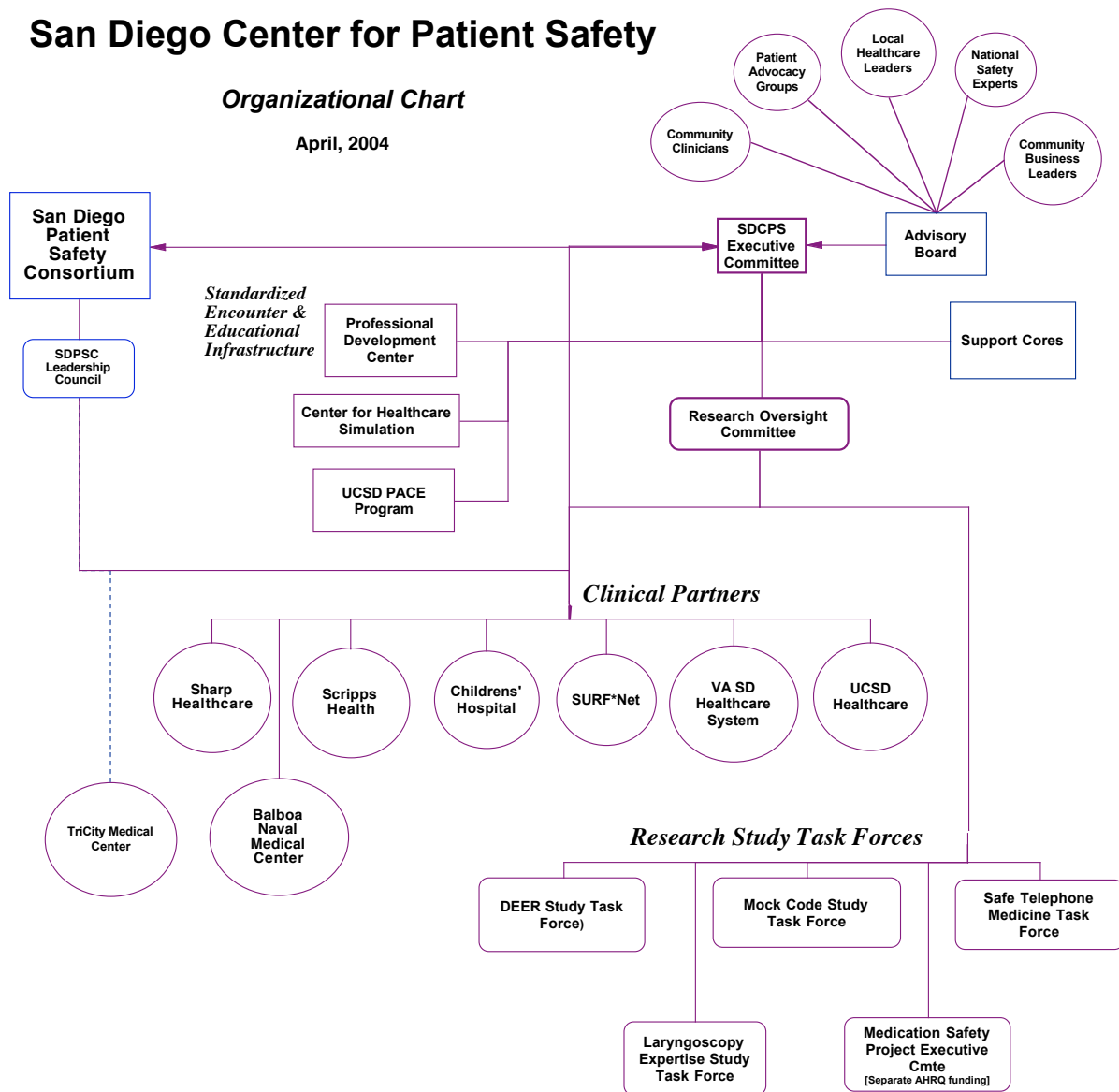
**Leadership, Core Infrastructure, and Administration.** Executive positions and core infrastructure were created to oversee SDCPS activities (Figure 1). **[AU: The figure is too large and will not reproduce well. Can you collapse some branches and make it smaller? Please submit in a Word compatible format so we can edit if necessary.] Redone and inserted into this document below. It is done in INSPIRATION so not sure how to get to you in format that would allow editing. If you provide a specific size, we could redo to fit in that size.**

**Figure 1.**

# San Diego Center for Patient Safety

## Organizational Chart

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An anesthesiologist (MBW) and a family physician (TGG) were appointed SDCPS Director and Co-Director, respectively. The Director was made responsible for the administration and overall direction, while the Co-Director was made responsible for establishing community relations and playing a key role in setting the research agenda. Although an Executive Committee, comprised of the Program Directors and other key SDCPS members, was the primary decisionmaking body, most important issues were vetted by members attending the monthly general meetings and/or by the Advisory Board. An Administrative Core facilitated communication with members and

provided financial and secretarial support, subject recruitment and compensation, and general project oversight. A key to early success was a strong administrative staff, including a full-time employee (KV) who worked almost exclusively on SDCPS activities. Part-time student workers assisted with, for example, logo and brochure design, meeting planning, and supporting research projects. While the other Cores ([Figure 1](#)) provided general support, most of the Center's cohesion resulted from the efforts of individual members engaged on a project-by-project basis.

**Team Development.** As an initial step toward growth, the Executive Committee recruited additional members with interest and expertise in areas critical to SDCPS' long-term goals. This effort provided the Center with input from a wide range of clinical and non-clinical disciplines. The members are from the following disciplines (in alphabetical order): anesthesiology, anthropology, engineering, family medicine, health care administration, health services research, informatics, internal medicine, medical education, nursing, pathology and laboratory medicine, pediatrics, pharmacy, psychology, quality improvement, radiology, reproductive medicine, risk management, sociology, and surgery. While the availability of a diverse membership was encouraging, in practice there was less initial collaboration than originally hoped. To facilitate member interaction, SDCPS research projects (mentioned below) were all multidisciplinary. In addition, the monthly group meetings included short educational presentations that rotated among Center members. The usual time pressures and competing demands kept early attendance at these meetings low (5-10 members). Subsequently, however, changes to the meeting times and continued attempts to meet members' needs have doubled attendance.

We recruited community and national patient safety education and research stakeholders to an Advisory Board to provide crucial input to the SDCPS. The Board includes prominent local clinicians (e.g., the Vice Speaker of the California Medical Association), three San Diego

healthcare system Chief Executive Officers (CEOs), the Dean of the University of California San Diego (UCSD) School of Medicine, the CEOs of two publicly traded San Diego-based medical device companies, a large health care purchasing cooperative, and a major medical malpractice insurer; and several national patient safety experts. The Board meets biannually to advise on issues such as community outreach, strategic direction, fundraising, and relevance of activities to other stakeholders. Given the difficulty of convening a single meeting of all Board members, we hold ‘split’ meetings, with half the Board members attending one of two sessions held on different days. To further enhance participation, the last two sets of Advisory Board meetings have been held by teleconference. We find that splitting the Board meetings works quite well, as it gives the Executive Committee time to process the recommendations from the first session prior to the second one, thus focusing discussion or questions to make the whole experience more productive. Board members also have been available on an *ad hoc* basis to provide special expertise.

The importance of an active Advisory Board cannot be underestimated. In SPCPS’ case, the original vision was one of an academic unit. But, at its first meeting, the Board strongly suggested that SDCPS assume a broader perspective and take on a greater community focus. Subsequently, the vision of the SDCPS expanded from just research and education to become a central resource for all patient safety issues in the county. Our newly crafted mission is to make “San Diego the safest place in America for patients to receive health care.” Today, our community-focus is considered as the Center’s major strength.

**Affiliated Laboratories and Programs.** SDCPS developed important relationships with several existing programs to complement and support its efforts. The Anesthesia Ergonomics Research Laboratory assisted in refining novel techniques of behavioral and cognitive task analysis for

SDCPS pilot projects and has provided essential technical support. The UCSD Professional Development Center recruits, trains, and deploys standardized patients as well as offers a controlled outpatient facility with video recording and review capabilities to perform hands-on clinical training and performance assessment. The UCSD Physician Assessment Clinical Education (PACE) program evaluates physicians who are facing medical board disciplinary actions. We hope this relationship will enhance our ability to predict which physicians may later develop disciplinary problems as well as to develop optimal methods to remediate these physicians. The San Diego Unified Research in Family Medicine Network (SURF\*Net) is an AHRQ-funded practice-based research network that collaborates with the Center and offers the potential for greater ambulatory medical research and educational activities. We also have the support of the County Medical Society, which has led to several potential collaborations (but, as of yet, no firm projects).

**Center for Healthcare Simulation.** Under the umbrella of SDCPS, the Center for Healthcare Simulation (<http://simcenter.ucsd.edu>) was created to conduct realistic and virtual reality (VR) simulation training and research across a spectrum of care settings, provider types, and patient populations. The focus of the Simulation Center is on multidisciplinary clinical education and performance assessment, although patient safety research also is supported. A Laerdal SimMan™ mid-fidelity computer-controlled mannequin simulator was purchased with funds provided by the UCSD Department of Anesthesiology. The VA San Diego Healthcare System (VASDHS) provided 500 sq. ft. of space. The UCSD Office of Learning Resources then contributed an Immersion Medical CathSim™ VR vascular access simulator. Over the subsequent year-and-a-half, the Center has received over \$100,000 in cash and in-kind donations (mostly clinical and video equipment). During this two-year initiation period, the Center has provided about 1100 contact hours of simulation training (300 hours in Year 1 and 830 hours in

Year 2). Course offerings now range from introductions to clinical medicine to complex crisis management. Trainees have included: medical and nursing students; house staff; practicing nurses, physicians, respiratory therapists, and pharmacists; and sales representatives from a medical device company. Simulation Center coursework has been incorporated into the VA hospital's Advanced Cardiac Life Support (ACLS) training, a nursing school practicum course, and the anesthesia residency curriculum.

Unfortunately, Simulation Center activity to date has generated only \$20,000 in revenue, exclusively from providing simulation training to for-profit medical corporations. Approximately \$75,000 in personnel cost subsidies have been provided to the Simulation Center by SDCPS and its affiliated programs. Attempts to obtain educational funding from the medical school or hospitals have thus far been unsuccessful. A promising but not yet successful avenue of future support is private philanthropy. As well, we are increasingly using the Center for research studies with the expectation of obtaining commensurate grant support for these projects.

## **Patient safety research**

We believe research is an essential component of a regional patient safety collaborative since it creates excitement, enhances outreach, provides new funding, engages academics, involves students, and in other ways contributes to the development of a safety culture. A key goal of the SDCPS research program, which focuses on patient safety at the point-of-care, is to develop, test, and operationalize novel and valuable tools and methods to close the gap between everyday practice and "best practice." Initial work, funded by the AHRQ grant, has been grounded in the concept of demonstrating the value of the "standardized encounter" for the study of medical error. A standardized encounter is a well-controlled reproducible simulated interaction between clinical care provider(s) and a patient (or patient data) or another clinician. Standardized

encounters may include the use of high or low fidelity realistic or virtual simulators, standardized patients, or standardized telephone or computer interactions.

Current standardized encounter research projects are: (1) examining patient-clinician interactions using standardized patient telephone encounters; (2) assessing clinician-clinician performance and teamwork during cardiac arrest resuscitations using realistic patient simulation; and (3) developing virtual reality technologies for medical procedure training and testing. Our other research efforts include a newly AHRQ-funded project to examine several novel instruments to elucidate the effects of the task distribution, workload, psychological state, and cognition of hospital-based physicians and nurses on the occurrence of medication errors. We have also initiated a collaboration with Northwestern University's DCERPS (Principal Investigator: G. Schiff) to study the nature of diagnostic errors by ambulatory primary care clinicians.

These projects have progressed more slowly than anticipated starting with delays in obtaining Human Subjects Committee approval. IRB-related obstacles stemmed from the IRB's inexperience in regulating patient safety research and the necessity to obtain IRB approval from multiple institutions. Despite these impediments, we are able to report some success, especially related to extramural research funding (two new grants funded), publications (almost a dozen), and continued expansion of, and increased member participation in, our research portfolio. In fact, three health care systems without an academic tradition of research participation have become involved in SDCPS research projects.

## **Patient safety education**

While there is a growing recognition of the importance of patient safety, there continues to be a need to disseminate basic concepts and provide practical advice to enhance the community's culture of safety. The SDCPS seeks to address these needs by educating a variety of stakeholders. A series of Patient Safety Grand Rounds was held for physicians and nurses in various departments at several health care delivery organizations. Academic members integrated patient safety issues into the undergraduate and graduate medical, pharmacy, nursing, and biosciences curricula. SDCPS also implemented a Visiting Professor program with presentations by experts in human factors, industrial engineering, cognitive psychology, and medical informatics. A comprehensive website (<http://cybermed.ucsd.edu/SDCPS>) was created to educate team members and the community about patient safety knowledge and activities. The website is a repository and point of dissemination of all materials developed or collected by SDCPS. Weekly emails to the members provided timely communication, safety information and references, and other relevant materials. These ongoing education initiatives have been valuable both internally to the Center's membership and as a source of outreach to the broader health care community.

## **Outreach to the community**

### **Annual conferences**

In summer 2002, the membership endorsed the conduct of an annual conference primarily for the benefit of the San Diego health care community. The objective was to stimulate awareness, bring in and exchange new information, invite feedback, and promote participation in SDCPS activities. The program was seen as an important opportunity to enhance collaboration, network with front-line clinicians, and promote a community wide culture of safety. While planning and

putting on a large meeting requires substantial effort, the process seemed to galvanize the membership.

SDCPS' First Annual Conference was advertised to members, the San Diego County Medical Society, the San Diego Society of Health-System Pharmacists, and San Diego's major teaching institutions and health care delivery systems. The conference, held in March 2003, was attended by 153 people. The conference program emphasized basic patient safety knowledge since most attendees were front-line clinicians unfamiliar with the subject matter. The conference also was a showcase for SDCPS' research accomplishments and the institutional members' current safety and quality improvement initiatives. Invited keynote speakers were Brent James, Executive Director and Vice President at Intermountain Healthcare, and Jon Lloyd, Medical Director at the Pittsburgh Regional Healthcare Initiative. The meeting generated \$14,000 in expenses and had a net profit of \$6,000.

The Second Annual Conference, held in March 2004, presented a more diverse program to its 177 attendees. Keynote speakers—James Bagian, Director of the Veterans Affairs National Center for Patient Safety, and David Woods, Professor of Industrial Engineering at Ohio State University—addressed system approaches of other high-risk industries (e.g., aviation, space travel) and their application to safety in health care. The meeting exposed attendees to patient safety concepts such as human factors and resilience engineering. In response to feedback received after the first conference, eight breakout sessions led by patient safety experts were utilized to further enhance collaboration and to facilitate exchange of information and project ideas among conference attendees. This second conference generated \$19,400 in registration fees and \$10,500 in sponsorships, exhibitor fees, and grant support. With estimated expenses of \$24,600, the net profit will be about \$5,000. While higher registration fees would have yielded

more net profit, the primary goal of greater community involvement was met by keeping the fees lower.

Both meetings received over 90 percent satisfaction ratings based on responses to a structured evaluation form. The conference stimulated an increase in the Center's individual and institutional membership and catalyzed enthusiasm for existing projects. Despite these benefits, we advise great care in the planning of a large conference since there can be significant financial risk. The meetings' modest profits were substantially enhanced by corporate and individual sponsorships. However, the conference successfully served as a fulcrum for soliciting a few major corporate donations to the Center.

We have plans to expand the conference program next year. We have initiated a relationship with the Strategic Alliance For Error Reduction (SAFER), a multidisciplinary collaborative that addresses patient safety issues across the University of California system, and are discussing the possibility of co-sponsoring a statewide patient safety conference.

## **The San Diego Patient Safety Consortium**

Hospital patient safety leaders are all subject to the same challenges and are all looking for the same answers. So they were quite receptive when SDCPS approached San Diego hospitals in the summer of 2002 to join forces in the pursuit of patient safety for the larger community. At the initial meeting in late January 2003, representatives from six health care institutions (see Figure 1), decided to start a consortium similar to the Pittsburgh Regional Health Care Initiative and the Madison Patient Safety Collaborative. These organizations all shared a common vision of a countywide collaboration focused on patient safety; sharing of information to improve care; and collaboratively identifying, evaluating, and implementing safety practices that bring results.

The key objectives were to identify and implement best practices, target areas most in need of safety improvement, and achieve measurable improvements in safety. The first hurdle to overcome was to share information across the hospitals despite the competitive marketplace and concerns about medico legal risk. A “Contract of Association” was drafted with extensive input from the legal counsels of all respective organizations. A key goal was to maintain the protection from discovery of safety data under California peer review law. The contract was revised numerous times over the course of a year until the language was acceptable to all the organizations involved. By then, Tri-City Hospital had joined the Consortium, and the group continues to attempt to engage the area’s three other major medical centers.

Other objectives of the written contract were to assure that each member is committed to keeping the proceedings of Consortium meetings confidential, to participating actively in Consortium initiatives, and to avoiding competing on the basis of patient safety (i.e.,, “our hospital is safer than yours”) Because these principles were felt to be fundamental to establishing an atmosphere of trust and facilitating the open exchange of ideas and information, they became a prerequisite for joining the Consortium.

**Infrastructure and Funding.** The Consortium established a leadership council of representatives from each participating institution. To ensure support from the highest levels of every organization, council members, who were primary leaders of their institutions’ safety activities, reported directly to their organization’s Chief Executive Officers (e.g., Chief Medical Officer or the Senior Vice President of Quality). The Consortium began with staff and infrastructure support from the SDCPS. This enabled the group to form, and to begin its work over the first two years without making the member institutions commit financial resources to an

unproven endeavor. As the AHRQ DCERPS grant concludes, alternative sources of support will need to be developed. The leadership council has recommended modest annual institutional contributions; however, they may be insufficient to accomplish all of the Consortium's goals. Solicitation of support from San Diego businesses and non-profit foundations is being considered.

**Initial Projects.** The leadership council began by identifying collaborative projects on which to work and gaining buy-in from their respective medical staffs and leadership teams. It was decided that the initial projects should focus on safety issues that the hospitals were already addressing or that were required by regulatory agencies. With these criteria, four general safety topics were identified: (1) medication safety; (2) patient identification and wrong-site surgery; (3) event reporting, including near misses; and (4) physical injury from falls. After further discussion and review, the following initial projects were chosen. A single member organization accepted responsibility to chair the task force for each project.

**1. Approved and unapproved abbreviations.** Lists of unacceptable and acceptable medical abbreviations were collected from all of the hospitals and collated along with the recommendations from the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) and the Institution of Safe Medication Practice. It is the Consortium's expectation that once this project is complete, medical staffs across San Diego will have a consistent standard to follow, not one that changes from hospital to hospital.

**2. Inter-facility transfer protocol.** A countywide working group was assembled to examine methods to facilitate enhanced communication of patient information during inter-facility transfers, starting with emergency department transfers. Currently, there are different processes

and requirements for information transfer based on the sending facility. The Leadership Council identified the need to provide a consistent countywide standard for the safety of these high-risk patients.

**3. Medication event triggers.** The lists of triggers that lead to medication error events were received and compared across Consortium members to establish a best practice for screening for harmful events. This was a low-risk but potentially high-yield information sharing activity that could bring all the hospital pharmacies in the community up to a common higher standard.

**4. Look-alike, sound-alike medications.** **[AU: Are these not medication event triggers as well? NO!]** Consortium members are sharing their lists of look-alike, sound-alike medications, as well as their intervention strategies to address them (e.g., TallMan letters, medication alerts, caution stickers, and alternative manufacturers). This was another opportunity for all of the hospital pharmacies to benefit from the work done in each hospital and to raise the standard across the community.

In addition to these formal projects, anecdotal advice across the membership has been invaluable. For example, the Naval Medical Center's use of formalized team coordination training curricula was enormously useful to Sharp HealthCare, which was subsequently able to contract with and execute a training initiative based on the referral. A presentation on one institution's approach to a JCAHO requirement led to a spirited discussion and creative solutions based on each organization's approach to meeting the regulatory requirement. The group also decided to create a safety grid listing all the institutions and their current safety initiatives along with contact information. This will be placed on a secure Web site to enable staff at each institution to collaborate across the county on similar projects.

With appropriate legal protection in place, an extremely powerful strategy for improving safety may be the sharing of sentinel events across the members. For example, if a patient dies in one hospital because of a medical device failure or an unusual drug reaction, it would be unfortunate if a patient at another San Diego hospital suffered the same fate because the information was not shared. The council recognized the ethical imperative to share such data, but was sensitive to legitimate legal and risk management concerns. Thus, given these concerns and the newness of the group, we choose to postpone undertaking such a high-risk initiative. As the group matures, we hope to take on the same level of collaborative self-evaluation and scrutiny that the airline industry has created with respect to their analysis of safety hazards.

## **Limitations and obstacles**

### **Member participation**

There is the perennial problem of getting active, busy clinicians and researchers together for meetings and other SDCPS activities. For example, while the membership rate has steadily increased, the average attendance at SDCPS monthly meetings has not increased proportionally. We considered moving the meeting's date, time, and location, but none of these changes would likely improve attendance. One of the research project teams has had some success facilitating group communication with regularly scheduled weekly teleconferences.

Although we have received endorsement at the CEO-level of our member organizations, active SDCPS participation by front-line clinicians in those organizations has been slow to materialize. The annual conferences, visiting professor program, and other educational initiatives have helped to increase our visibility to front-line clinicians and have improved their

engagement. We are currently working on a marketing plan for the Consortium that we hope will attract greater community involvement.

## **Ongoing financial support**

The AHRQ DCERPS grant program was essential to the creation of this entity because it allowed a federal research agency to fund non-research activities to foster a community wide patient safety infrastructure. However, as the grant comes to an end, we are struggling to find other stable sources of income to sustain non-research activities, including the overhead costs of the established infrastructure. We created a corporate sponsorship program in which, depending on the level of support, donors receive various benefits such as discounts on services, access to programs, and increased public relations. We also established a fund at the UCSD Foundation to handle individual philanthropy. Thus far, these efforts have met with only mild success, raising sufficient funds to cover about 60 percent of an additional year of non-research costs.

## **Lessons Learned**

Despite its limitations, the SDCPS has made substantial progress. Several factors that contribute to the success of the Center include the “incentive program” concept, leadership engagement, and proportional growth and support. As learned from other collaboratives,<sup>4-5</sup> leadership engagement is essential to success because it enhances commitment, trust, collaboration, and mutual support to attain common goals. The creation of the Patient Safety Consortium, for example, would not have been possible without the direct support of the member organizations’ senior leadership. CEO-level endorsement reduced traditional barriers such as resource deployment and legal concerns that might have discouraged sharing of even non-threatening information (e.g., medication event triggers, safety solutions). The SDCPS Directors’

access to senior health care and business leaders has proved invaluable for accomplishing goals and facilitating growth.

As the collaborative and Consortium have grown, there has been increasing pressure to take on new initiatives. However, we choose to not grow faster than our infrastructure and dollars can support. In fact, the Advisory Board consistently advised that SDCPS complete current initiatives before undertaking new projects, no matter how exciting or promising. The Board emphasized the importance of having tangible deliverables to foster greater support from the community.

## **CONCLUSIONS**

SDCPS is striving to improve San Diego County's capacity in patient safety research, expand the community's patient safety knowledge base, and establish mechanisms to ensure that new knowledge is incorporated into actual practice and its impact is assessed. The main goal is to support our clinical partners' ongoing safety efforts. The San Diego Patient Safety Consortium is unusual in that health care organizations that are otherwise fiercely competitive are collaborating on implementing and maintaining patient safety initiatives for the benefit of the community as a whole.

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## Authors' affiliations

San Diego Center for Patient Safety, San Diego, CA (NP, KV, TGG, MBW ), Sharp HealthCare, San Diego, CA (NP), the University of California San Diego School of Medicine, La Jolla, CA (KV, TGG, MBW), VA San Diego Healthcare System, San Diego, CA (MBW).

*Address correspondence to:* Matthew B. Weinger, MD, Center for Improving Patient Safety. Vanderbilt University School of Medicine, 1211 22<sup>nd</sup> Avenue South, VUH 2301, Nashville, TN 37205. Email: matt.weinger@vanderbilt.edu Tel: (615) 936-1206, Fax: (615) 936-6493.

## References

1. Chassin MR, Galvin RW. The urgent need to improve health care quality. JAMA 1998 Sep; 280 (11):1000-1005.
2. Kohn LT, Corrigan JM, Donaldson MS. To err is human: building a safer health system. Washington, DC: National Academy Press; 1999.
3. Coye MJ. No Toyotas in health care: why medical care has not evolved to meet patients' needs. Health Affairs 2001; 20(6):44-56.
4. Sirio CA, Segel KT, Keyser DJ, et al. Pittsburgh Regional Healthcare Initiative: a systems approach for achieving perfect patient care. Health Affairs 2003 Sep-Oct; 22(5):157-65.
5. Young D. Massachusetts moves ahead with patient safety initiatives. Am J Health Syst Pharm. 2004 Mar 1; 61(5):434, 437-8.