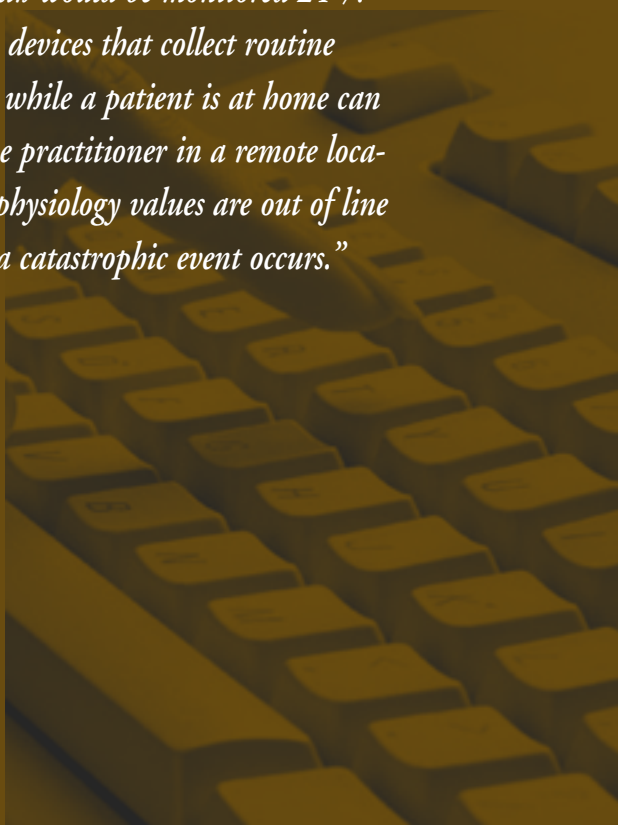




Partners HealthCare, Boston

“... a monitoring device worn much like a wrist watch could make phrases such as “hypertension – the silent killer” or “sudden cardiac death” obsolete. Annual physicals could eventually be a thing of the past as a person’s health would be monitored 24-7. Even today, devices that collect routine health data while a patient is at home can alert a nurse practitioner in a remote location if any physiology values are out of line well before a catastrophic event occurs.”



PROGRESS REPORT 2004

A MESSAGE FROM THE DIRECTOR



We must give more credence to the power of the *connected health consumer*. These are individuals who in some measure access health care through communication technologies. Among other benefits, this approach permits monitoring at anytime, anywhere with the capability to respond to medical crisis or concern promptly and effectively. *Importantly*, the connected patient can maintain his or her freedom and quality of life while also limiting the need for costly institutionalized care.

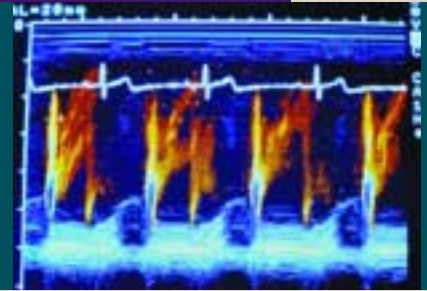
As America ages, it is imperative that we advance this emerging industry of healthcare without walls – known variously as Telehealth, Digital Home Health, and Telemedicine. The *connected health consumer*, ranging from the near ill, or perhaps better stated as the worried well, to the chronically ill will be the beneficiaries of extraordinary communication technology advances.

I am convinced that someday – and sooner than some might expect – a monitoring device worn much like a wrist watch could make phrases such as *“hypertension – the silent killer”* or *“sudden cardiac death”* obsolete. Annual physicals could eventually be a thing of the past as a person’s health would be monitored 24-7. Even today, devices that collect routine health data while a patient is at home can alert a nurse practitioner in a remote location if any physiology values are out of line well before a catastrophic event occurs.

We are making steady progress, and innovations abound. And most importantly, the concept of the *connected health consumer* has evolved from vision to reality. I am pleased to share our 2004 accomplishments with you in this Progress Report.

JOSEPH C. KVEDAR, MD
Director
jkvedar@partners.org

INNOVATIONS FOR THE 21ST CENTURY PATIENT



Whether referred to as *telehealth*, *telemedicine* or *e-health*, healthcare communication technologies are now recognized as key components to the transformation of today's health-care system. Some observers even claim that the impact of communication technologies on medicine may be as great as that of the x-ray a century ago. Below is a brief synopsis of Partners Telemedicine's programmatic developments during the past year. A more comprehensive analysis of each program is available at www.telemedicine.partners.org.

TELEMEDICINE'S HOME CARE REMEDY

Partners Telemedicine has made great strides in integrating telemedicine solutions into the provision of home care. Our innovative collaborations with Partners Home Care have the potential to move the home care industry to a whole new level. It is not far fetched to imagine that soon these solutions may have the potential to develop into wellness services. Services that passively monitor people 24-7. These monitoring devices routinely gather data such as blood pressure, cholesterol and blood-sugar prompting early intervention by a nurse in a remote location if any physiological values are abnormal.

Using web-based technology to monitor patients is also addressing the ubiquitous nursing shortage felt nationwide. At Partners Telemedicine, our *Connected Health Consumer* initiatives have focused on the impact of communication technologies on wound care and congestive heart failure (CHF) patients.

Other collaborations are also making their mark on this industry. Our collaboration with Boston University is focusing on a test bed of 500 homes connected with broadband and wireless technologies. In this connected home environment a variety of sensor messaging technologies are employed with the goal of understanding their impact on health and illness.

Partners Telemedicine is also working closely with CIMIT (the Center for Integration of Medicine and Innovative Technology) on *Connected Health Consumer* initiatives that will bring innovative sensor and monitoring technologies rapidly into the clinical setting. Also support was provided to a wound program at Brigham and Woman's Hospital that provides remote surgical wound imaging on patients who have been recently discharged from the hospital.

INTERACTIVE CONSULTATIONS

Teledermatology is one of the most promising areas of telemedicine and it has great potential for helping relieve today's overburdened dermatology system. Through remote, web-based monitoring, patients can reduce clinical visits for chronic diseases such as

psoriasis or for conditions that require long-term follow-up, such as melanoma.

On the island of Nantucket the Teledermatology Clinic, in collaboration with the Nantucket Cottage Hospital, is a tremendous success. Through the use of communication technologies, islanders are examined remotely by Harvard-affiliated dermatologists. Digital imaging allows dermatologists to closely examine skin lesions while they converse with patients in real-time, viewing each other on monitors. The clinic is so popular that there is a three-month wait period to get an appointment.

ONLINE SECOND OPINION CONSULTATIONS

With a hefty annual increase of 20% in patient volume, Partners Online Specialty Consultation (POSC) services expanded its patient base through both the health benefit markets and the empowered consumer market. POSC's services are now included in the benefits package of a Fortune 100 company. And Benemax, a fast-growing employee benefit management firm, has recently added online second opinions as part of its health plans for employers. Benemax's coverage of this service has the potential to be a tremendous asset to employer-funded health benefits. Their clients – who are employers – add this benefit to employee packages allowing them access to specialists in the Partners HealthCare System. Other significant client expansions include initiatives with International SOS, the largest medical assistance company in the world; and SAMSO, the healthcare affiliate of the state-owned Saudi Arabian Oil Company (ARAMCO).

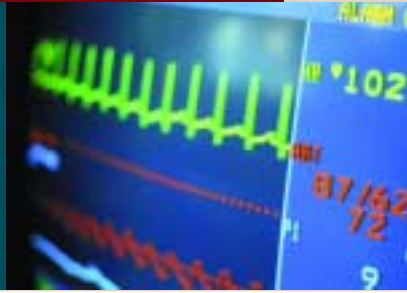
UNDERSERVED OUTREACH PROJECT

Utilizing telemedicine to bring sustainable and quality health care to underserved populations is a core mission of Partners Telemedicine. This mission is best exemplified by Partners Telemedicine's four-year-old Cambodian program. Two monthly telemedicine clinics, held in remote areas of Cambodia, give patients access to consultations performed by Harvard-affiliated physicians.

Earlier this year, a team of specialists from Partners Telemedicine spent a week performing an on-site assessment of the program. High marks were given to all who are involved in this complex effort. (*Refer to Research Section for more details on clinical trial results.*)

Back in the United States, a vigorous effort was launched in Lowell, a city just north of Boston, to raise funds for the program. Lowell has become home to thousands of Cambodian refugees in recent years. This effort will continue into the next fiscal year.

TELEMEDICINE RESEARCH



In order for communication technologies to establish a strong foothold in healthcare, outcomes must be consistently documented in the areas of cost, quality, efficacy and accessibility. At Partners Telemedicine, research is thriving. During the past year, the program has shifted its research focus from examining the significant impact of the program as reported in a retrospective study published in the *British Medical Journal* to measuring health outcomes.

The following studies, which are not discussed in order of priority, provide an overview of the clinical trials Partners Telemedicine is currently undertaking.

COLLABORATING ON RESEARCH

Research collaborations have been one of the highlights of this past year. An important one is a Motorola-funded clinical trial, the *Cellular Technology Initiative*, exploring the efficacy of using mobile phones to monitor patients with advanced congestive heart failure (CHF) from home. The study measures the patients' medical outcomes, level of mobility and degree of satisfaction with the treatment. The trial could have broader implications: if successful with the sickest CHF patients, cellular phone technology may hold great promise for CHF patients who are less ill.

A wound care pilot and a CHF telemonitoring trial are the focal points of Partners Telemedicine's long-standing collaboration with Partners Home Care under the *Connected Health Consumer* initiative. The pilot will determine if remote management of wounds by a wound specialist nurse results in higher quality care, lower costs and greater patient satisfaction. Because of the promising preliminary results, this remote management initiative has sparked much enthusiasm from the clinical practitioners and staff spearheading the trial.

Meanwhile, the *Connected Health Consumer* team has been busy collecting data on the use of remote home monitoring technologies in the CHF

Partners Home Care collaborative trial. Like the Motorola CHF trial, its purpose is to determine if physiologic monitoring of class 3-4 CHF patients at home results in better management of the illness, enhanced quality of life for patients and cost savings.

PROMISE OF TELEDERMATOLOGY

Teledermatology continues to be a major area of research. One research study explores the possibility of having patients use their own digital cameras to take a set of diagnostic images of their own skin lesions. Initial results show that little training is needed to successfully capture such images and transmit them to specialists. A separate study looks into the economic impact of doing dermatology follow-up visits on line.

Additionally, Nantucket Cottage Hospital and Boston Homeless Shelter are clinical test sites for live, interactive programs in *Teledermatology*, whereby Harvard-affiliated dermatologists remotely "examine" patients via secure, live and interactive video conferencing. The study examines if *Teledermatology* at these sites is cost-effective and result in improved care quality.

ERASING GEOGRAPHIC AND TIME BARRIERS

A major focus for Partners Telemedicine continues to be the utilization of telemedicine in the developing world to reach underserved populations. The *Cambodia Teleconsultation Initiative*, now in its fourth year, is helping answer questions like: "How much of an impact can such projects have on outcomes and costs?" and "can these programs become self-sustaining?" By early 2005, results of an analytical review of this initiative will be made public. The preliminary results are promising: fewer patients in these remote Cambodian villages are being sent to regional hospitals. And in the four years since the first clinic opened its doors, the amount of time patients suffer with their chief complaint before seeking help has decreased from three years to six months, reflecting dramatic improvement in access to care.

Erasing geographic and time barriers is the essence of Partners Telemedicine's *Online Second Opinion Consultation (POSC)* initiative. Using Partners Telemedicine's secure Internet environment, Harvard-affiliated physicians are able to extend the most up-to-date clinical knowledge to physicians and patients around the world. Two years worth of case review and patient/user feedback points both to high levels of patient satisfaction and improved quality of life. Both reflective quicker access to specialists which leads to revised treatment plans, often introducing state-of-the-art protocols.

"One research study explores the possibility of having patients use their own digital cameras to take a set of diagnostic images of their own skin lesions."

DISTANT EDUCATION

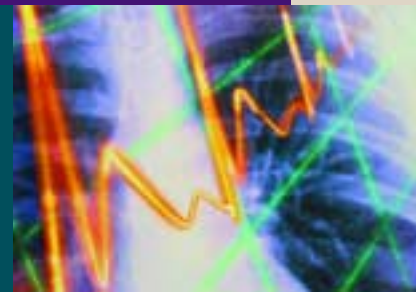
LEADERSHIP MATTERS

It was in the early spring of 2004 when Dr. Kvedar proudly accepted the role of president of the American Telemedicine Association (ATA). Focusing on both the societal and organizational imperative to move the ATA to a new level, Dr. Kvedar sets an ambitious agenda:

- Expanding ATA membership in order to speed the adoption of telecommunication approaches in the medical field, a membership campaign is initiated – *Member Get a Member Campaign*;
- Educating health consumers about telemedicine's role in improving access to, and the quality of health care, ATA's media relations program is enhanced. A new section on the ATA website targets journalists offering them background on communication technologies in health care as well as serving as a resource to both print and broadcast media;
- Creating a unified message to define communication technologies in health care whether it is to be called telemedicine, telehealth or e-medicine. Through creative branding the public will gain a more comprehensive understanding of the role communication technologies play in health care; and
- Increasing substantially the number of patients worldwide that benefit from communication technologies in health care as spearheaded by ATA, although readily acknowledging that the ATA has made great progress over the last decade.

Dr. Kvedar's ATA mantra is simply...

"It is time that telemedicine reaches its potential and fulfills its promise. It is time to overcome the tragic reality that a patient's locale is the most important determinate in his or her health outcome. And it is time as an Association to come together as never before so that our collective voice becomes a critical force in the shaping of public health policy. We have a responsibility... and we will fulfill it."



As a leader in the international network of telemedicine practitioners, Partners Telemedicine sets the pace for educating physicians and practitioners worldwide.

INTERNATIONAL GATHERING IN BOSTON

Kudos echoed through the halls of Harvard Medical School's new conference center as Partners Telemedicine launched its first symposium this fall, *Optimizing Care through Communication Technologies: Fulfilling the Promise of e-Medicine, Telehealth, Telemedicine and e-Health*. Utilizing an innovative format of brief keynote presentations followed by moderated panel discussions, a fast-paced atmosphere was created as leaders in this field shared their knowledge of technology, reimbursement, risk management and lessons learned.

More than 250 people attended the symposium, including groups from England, Nigeria, Egypt and Italy. This international venue prompted lively and enthusiastic discussions with hopes by many that future collaborations might be in order. Responding to an overwhelmingly favorable evaluation of the symposium, Partners Telemedicine is already planning a similar event for next year.

PROVIDING SPECIALTY TRAINING TO PHYSICIANS

Board eligibility in the field of internal medicine requires that residents have experience in a number of specialties. But residents at some of the nation's medical centers do not have adequate access to specialists for this training. Partners Telemedicine's *Tele-education* initiative is part of the solution. For example, at St. Michael's Medical Center in Newark, NJ, young physicians are trained by Harvard faculty

through web-based, interactive training. The curriculum includes case discussions and lectures. The program has been so successful that more monthly lectures have been added. Harvard-affiliated specialists also deliver live, interactive lectures to physicians at SAMSO, the healthcare affiliate of the state-owned Saudi Arabian Oil Company (ARAMCO). All receive CME credits for their participation.

CLOSER TO HOME

Through the generous support of Connectics, a specialty pharmaceutical company focused on the treatment of dermatologic conditions, Partners Telemedicine was able to add a fellow to its research fellowship program. Each fellow is expected to design, conduct, present and publish an original investigative project.

"As a leader in the international network of telemedicine practitioners, Partners Telemedicine sets the pace for educating physicians and practitioners worldwide."

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