



## **Calibrated Care is Closer to Home:**

**2010 Aging and Health Technology**

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## EXECUTIVE SUMMARY

The one consensus about health care is that its cost growth is unsustainable: according to some estimates, reaching nearly \$2.5 trillion in 2009 or 17.3% of GDP. With little general agreement on how to contain costs, some consumers and providers are finding ways to get or deliver care outside of the walls of the doctor's office and emergency room. Today home monitoring and telehealth technology markets, self-care technologies, retail clinics, and use of online websites help individuals and caregivers to manage chronic disease. The key to managing health and disease as well as the cost of care is matching the right level of care at the right time and right place. This is called Calibrated Care. By 2020, we believe providers and patients will willingly participate in a process of *calibrated care* through lower-cost, technology-enabled and closer-to home interactions.

## WHO SHOULD READ THIS REPORT?

This report looks at the Aging in Place Technology category of Health and Wellness described in the Updated 2010 Market Overview.<sup>1</sup> As follow-on to that overview, it focuses on technologies that help management of chronic disease and specifically the market of technologies that make it easier to deliver and receive care outside of the doctor's office. As such, it is relevant to:

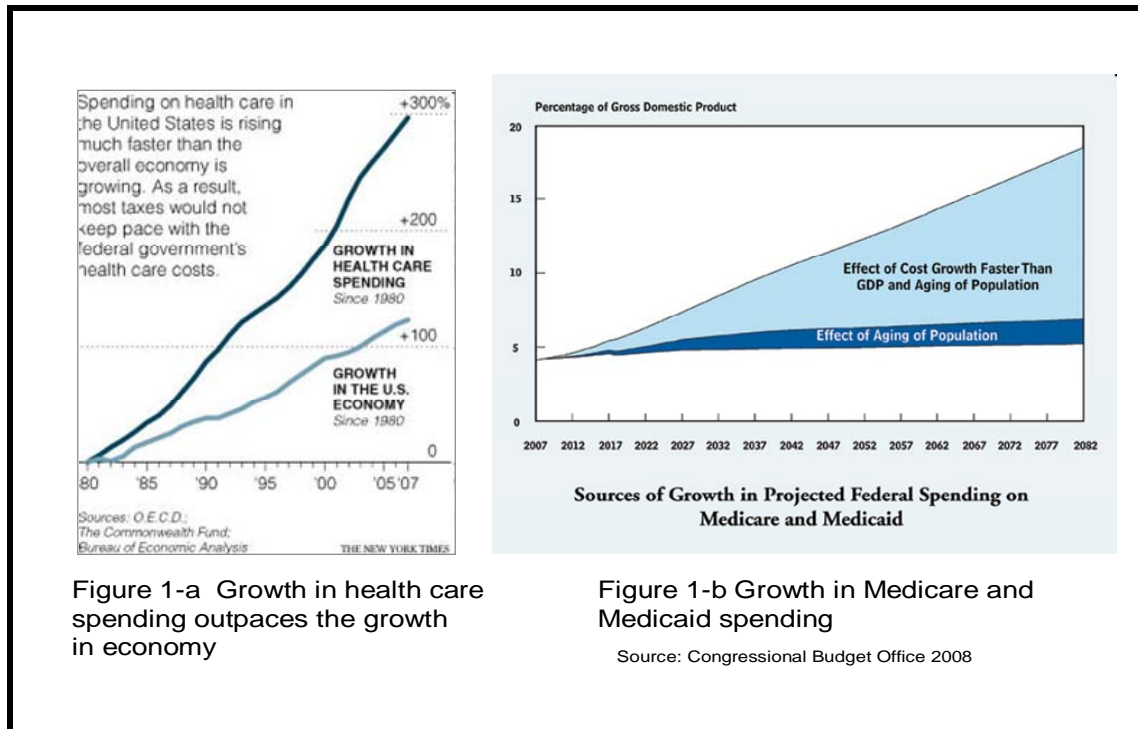
- Vendors within or considering entry into the market
- Home care agencies
- Community health centers
- Geriatricians, physicians, telehealth organizations
- Retail clinic providers
- Hospitals and integrated service delivery networks
- Government agencies and policy makers
- Geriatric care managers
- Caregivers, seniors, and family members
- Health Insurance providers and integrated Provider/Payers



## HEALTH COSTS OUTPACE ECONOMY, DEMOGRAPHICS BUT CHANGE IS AHEAD

At the very least, 2010 will be remembered as the year in which the booming healthcare industry was caught in the spotlight of sweeping health care reform legislation, the chaos of congressional bills, and the cacophony of lobbying intensity, political posturing and divided public opinion. But amidst the racket, sprinkle in new reports about US obesity rates and related and growing chronic disease costs, and we have a recipe for pain as:

- **Current health care cost growth is unsustainable.** First combine the growing percentage of GDP consumed by healthcare (17.3% as of 2009) in comparison to real income growth (see Figure 1-a). Add the 7.8% annual Medicare and Medicaid cost growth and a future funding crisis (Figure 1-b). Now you have a recipe with pressure and opportunity for change – beyond even the recent government action.



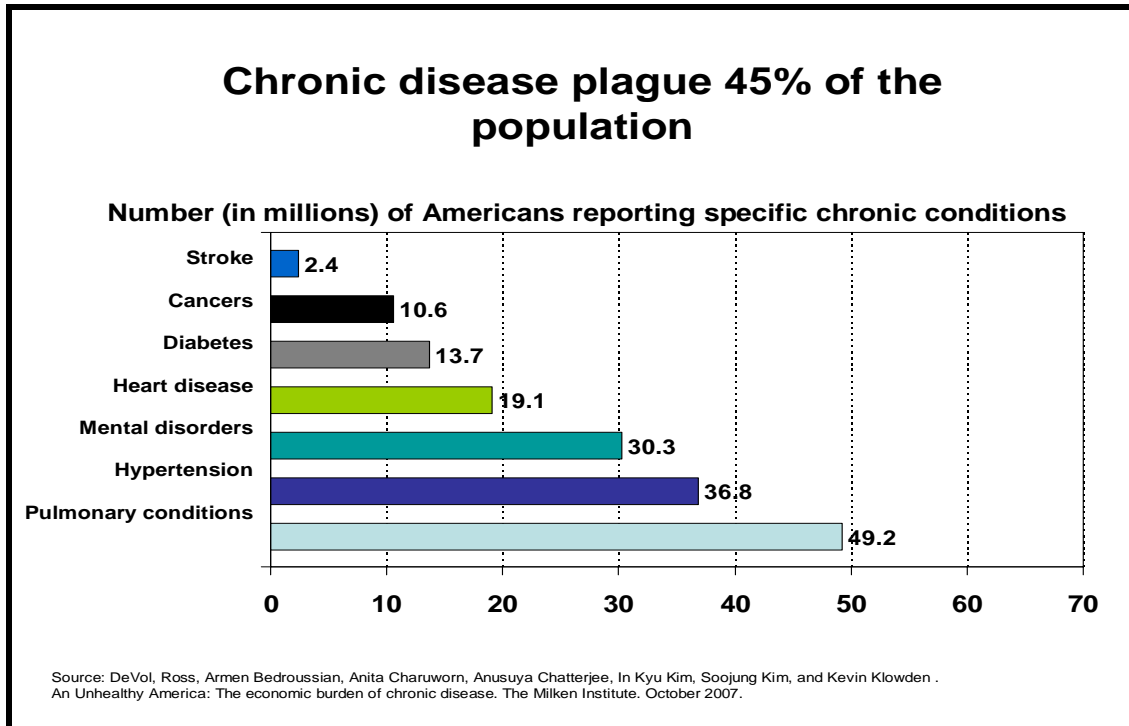
**Figure 1-a, 1-b Healthcare cost, Medicare/Medicaid spending**

- **ER visits depend on fixed infrastructure and generate large and avoidable cost.** There were 119 million trips to emergency rooms in 2006 (up 26%), but most are not ‘emergencies’, according to the Center for Disease Control.<sup>2</sup> Visitors were those covered by Medicare or Medicaid, lack insurance or access to a doctor, patients with after-hours minor problems, treatment for asthma, or those seeking confirmation of self-diagnosis and/or prescriptions. ERs are the always-on but not always-cheapest



solution. An ER visit averages more than \$1000 in cost (compared to \$150 to see a doctor), and invites utilization of 24x7 availability of test equipment and technicians.

- **Chronic disease drives much of health care cost.** Nearly half of Americans suffering from at least one chronic condition, and 50% of those over age 65 suffer from at least two.<sup>3</sup> These two include diabetes or high blood pressure, ongoing problems that need to be continuously managed rather than allowing them to escalate into incidents requiring a visit to an ER or a face-to-face with a doctor.



**Figure 2 Chronic disease plagues 45% of the population**

### **Chronic Disease Management Is Moving Away From ER and Doctor's Office**

Studies about chronic disease sufferers have shown that many doctors' and emergency room visits provide informational counseling, check on current status, or update prescriptions – activities that could be facilitated through phone calls, e-mail consultations, or camera visits. It has also been proven that a significant portion of acute visits resulting from chronic disease could have been avoided with available in-home monitoring technology. Today's consumers are willing to explore alternatives as:

- **Monitoring and managing chronic disease at home.** In 2010, the global market for home blood pressure monitors will reach \$1 billion, home glucose monitoring \$7 billion.<sup>4</sup> Additional at home testing technologies are becoming more reasonably available to the patient at home. Testing blood coagulation level (PT-INR), for



example, can now be done with a home device from **Philips** that retails for \$400; cholesterol testing kits are available for \$10 with results available in 15 minutes. More than two dozen companies including large scale provider like Philips, Honeywell, Bosch, Intel, GE, and Bayer offer comprehensive home monitoring solutions. In addition, stand alone solutions including home blood pressure cuffs, diabetes monitors, scales for tracking weight, and even home defibrillators are being marketed today.

- **Visiting with the doctor online or in groups begins to be accepted.** Recognizing that they can't continue to manage care exclusively with face-to-face visits, thirty-nine percent of doctors are now communicating with their patients via e-mail, up from 16% the year previous.<sup>5</sup> And businesses like **HelloHealth, TelaDoc and ConsultADoctor** that offer phone and online visits are thriving – TelaDoc grew in 2008 from 300,000 subscribers to over 1 million in a period of just 18 months. With recognition of the inefficiency of the 1-1 doctor check-in visit, counseling for diabetes patients is now offered in group visits.<sup>6</sup>
- **Physician consistency for seniors is limited, opening the doorway to alternatives.** By 2006, only 40% of Medicare patients in the hospital received a visit from a doctor they knew, and only one-third saw their primary doctor when they were in the hospital -- 75% were discharged unable to name a doctor who treated them. Consequences of this lack of continuity include poorly understood discharge instructions, medication errors, lack of follow-up appointments, and risk of re-admission.<sup>7</sup>

### **But Most Payers and Providers Seem Stuck in an Office Paradigm**

Health care services for boomers and seniors to date have been largely delivered where the providers are – doctors' offices, clinics, hospitals, and nursing homes. And according to a survey just published by IBM, “most doctors are not regularly using technology to facilitate more real-time communication with their patients.” Meanwhile, hospital and physician interest in home and remote management of chronic disease is growing, but adoption of telehealth is still limited.<sup>8</sup>

- **Despite burgeoning costs and looming shortages, Medicare is on the fence.** The American Academy of Family Physicians (AAFP) predicts a shortage of 40,000 physicians by 2020. Today CMS provides reimbursement for telehealth episodes, but does not endorse or encourage the use of telehealth care delivery, instead proposing changes to telehealth credentialing.<sup>9</sup> This is despite proof points from organizations that managing care in home settings supported by technologies is feasible, available, and works.<sup>10</sup>



- **In the midst of shortages, cheap virtual visits still don't relieve pressure.** In addition to a shortage of doctors, there is also a pharmacist shortage, but pharmacies are less focused on the automation opportunities in pharmacies, instead viewing certification of pharmacy technicians as a way to fill the gap.<sup>11</sup> Shortage of primary care doctors in the US is well understood, but virtual doctors' online doctor visits are not yet filling the capacity gap, even though an estimated 1 in 5 doctor's visits could be eliminated with online access. And reports encourage online visits, but physicians are still worried about associated risks and reduction in income.<sup>12</sup>
- **Incentives are upside down.** Some nurses are afraid of being replaced by telehealth despite shortages. Although improved health and reduced cost reductions for home monitoring have been proven repeatedly, when telehealth technology is deployed, it is generally reimbursed for a limited number of days because of reimbursement policy (an exception is a community based services like Roanoke Chowan Community Health Center).<sup>13</sup> With the new Health Care law in effect in 2012, readmissions of Medicare patients within 31 days of discharge will be subject to payment penalty.<sup>14</sup>
- **Full endorsement by doctors still hasn't happened.** And despite the telehealth Medicare reimbursement code, remote and online doctor's visits have interest, but no widespread adoption – yet. The American Academy of Family Physicians supports the idea, but stresses that only non-urgent medical issues can be handled this way – “E-visits are best suited for people with easy to diagnose aches and pains, or those who need follow-up visits.”

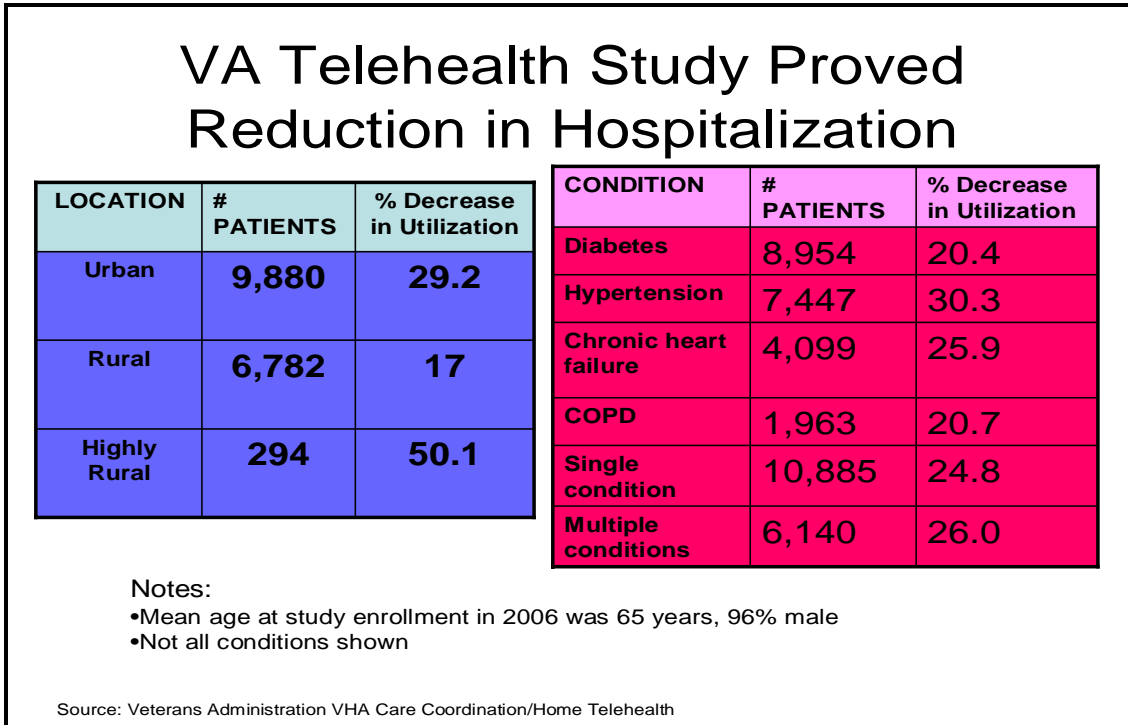
### **Some Providers Are Doing Things Differently to Lower Costs**

Vertically integrated health providers – where hospitals, physician groups, and health plans are owned by a single entity -- are leading the way in use of remote telehealth monitoring technologies and virtual doctor visits.<sup>15</sup> With rising Medicare costs and increased Government oversight, it is likely that reimbursement incentives will increase the availability of these technologies beyond just the vertically integrated, some of which can be used by consumers who don't want to or can't get to a doctor, with or without reimbursement from insurance.<sup>16</sup>

- **Veterans Health Administration proved telehealth effectiveness.** With more than 17,000 patients participating in a study of care coordination/home telehealth, the Veterans Health Administration published results in 2008 that were conclusive about the benefits of delivering the 'right care in the right place at the right time.' With coordinated care and a variety of technology enablers, participants' bed days of care dropped 25% and hospital admissions 19%. The cost of \$1600 per year per patient was



substantially less than primary care costs of \$13,121 per year or market nursing home care at the time of the study of \$77,745 per patient per year (see Figure 3).



**Figure 3 Telehealth Study Proved Reduction in Hospitalization**

- **Kaiser Permanente proves the cost-saving benefits of email.** A study by Kaiser Permanente, a provider with a large network of salaried doctors, demonstrated in 2007 that secure online communication reduced the likelihood of a doctor’s visit by 7-10% and the need for a telephone call by 14%.<sup>17</sup> The organization in some regions reimburses the doctor \$50 for a virtual ‘email visit’ and uses pre-visit e-mails to cut time used (and perhaps wasted) in face-to-face visits.
- **Licensing process changes pave a path to telemedicine’s adoption.** The license process for doctors is now becoming as standardized as the college application. What’s it mean? A standard application process enables doctors who practice across state lines – making licensing easier for telemedicine doctors.<sup>18</sup>
- **Self-care and online visits are acknowledged by some payers and clinicians.** As far back as 2001, research has proven that asthma patients can self-test lung function and monitor using an Internet based system.<sup>19</sup> And other insurers have now set prices for online access to a doctor: for example, Empire Blue Cross/Blue Shield’s use of RelayHealth, with a co-payment of \$5 per online visit – using the patient’s own doctor.<sup>20</sup>



## WHAT'S MISSING – CALIBRATED CARE

Despite constant lamenting about ballooning costs, industry participants are tangled in a process that enables and rewards patients to use and providers to deliver the most expensive care often for problems that could be more effectively and efficiently delivered at a lower cost if we matched (or calibrated) the right level of care at the right time and right place.

*Calibrated Care includes determining and delivering the right level of care at the right time and in the right place*

Calibrated care depends on tech enablers for:

- **Assessing a problem in the lowest cost interaction mode.** Today, when you call the pharmacy, the first option presented (“If you’re calling to renew a prescription, press 1”) is the automated interaction. With the right process, providers and patients of non-emergency care can become accustomed to trying the simplest and lowest cost interaction mode first – which may be online.
- **Routing to the right level of interaction.** Based on the answer to a few questions about the nature of a problem, telephone and Internet-based systems can smartly transfer a person to the right interaction and the appropriate skill level that matches the circumstance. For example, software can verify if the described need is urgent, if it required special knowledge to solve, whether it is a new or existing condition, whether you previously discussed it with someone – or whether more information is required.
- **Preserving the data for follow-on and follow-up.** Multiple industries (including vertically integrated healthcare) collect just enough data to use in subsequent steps. This securely managed ‘just enough’ data is useful in the event that you are placed on hold, transferred to a specialist, or your e-mail is evaluated by a more appropriate responder. And if needed, that data can be used to retrieve a more detailed history.

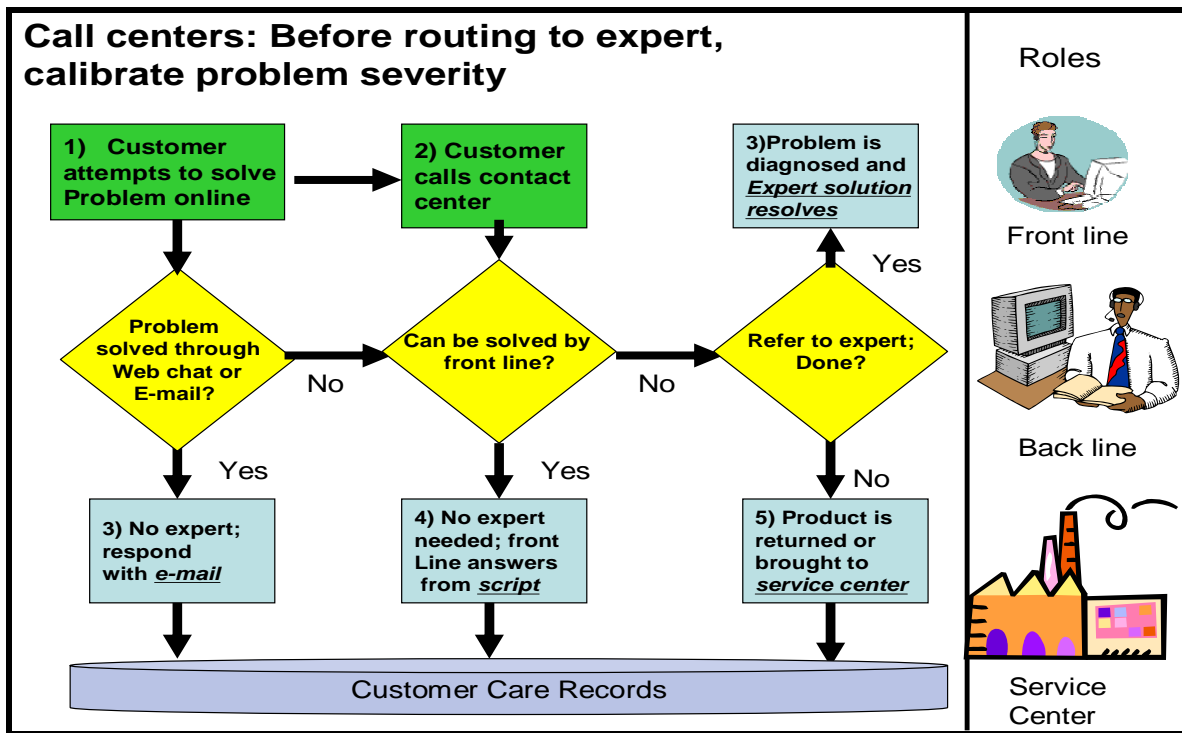
## Triage of Problem Severity Is Well Understood In Battle and In Customer Service

Medical triage processes that separated wounded into urgency categories originated on battlefields long before customer service was invented. But today, everyone recognizes the process transformation that has occurred in the customer service world over the past twenty years – where expertise is rationed out through a problem refinement process





initiated at the first contact point. Let's look at that process and how information supports it (see Figure 4):

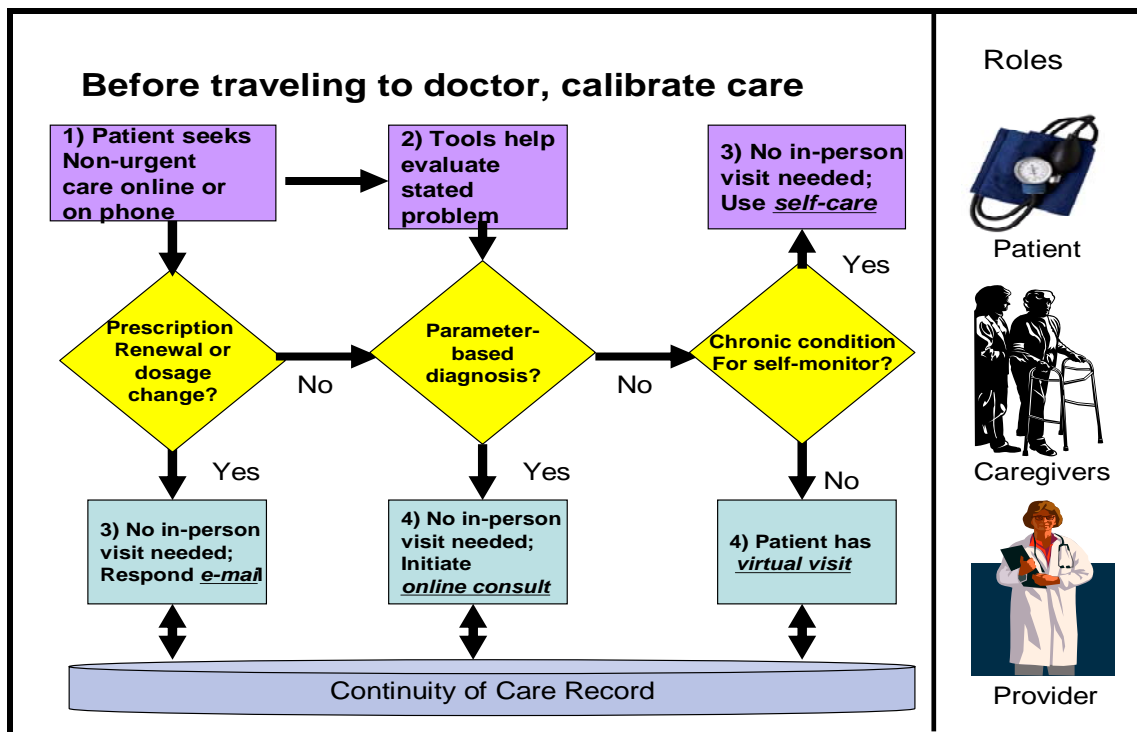


**Figure 4 Call centers calibrate severity, then route to expert**

- **Calibrate severity of customer problem.** At each level of customer interaction, there is an associated cost – automated lookup has the lowest cost, the most senior expert represents the highest cost. Effective problem identification up front and smart routing helps minimize overall costs – and ideally shouldn't require the customer to repeat his or her problem if just enough formation is captured and shared across all levels of interaction.
- **Determine expertise requirement.** Once a process can collect information, narrow problem definition, and match resource to problem, industry veterans know that it controls costs and still provides (self or expert) service as required. The benefit is obvious – rapid solution and reduced utilization of the most costly resources – but the less obvious benefit to customers is being able to use self-service to resolve issues on their own. Today this has become commonplace for the banking, product support, travel and hospitality industries.
- **Preserve history to improve service.** Although customers complain about the funneling of service needs through qualifying questions and process steps, they – and the industries with which they interact – have adjusted – and are particularly



pleased when their prior history is accessed during their next call. The health care industry should use a similar data-driven decision-making process (see Figure 5):



**Figure 5 Decision-making processes to calibrate care**

### Calibrated Care Serves Key Participants

Chronic disease patients and their care providers are an important example of those who need more cost effective care and/or monitoring. These conditions depend on management and appropriate, timely interventions to prevent more acute (and expensive) care events. Calibrated care depends on a technology-enabled process of deciding whether care is needed, the level of care that is required – and participants’ willingness to play roles in the process, for example:

- Patient monitors or seeks care – phone or online.** One reason cited for lack of broad-based deployment of technologies for preventing or mitigating chronic disease is the lack of involvement of individuals in their own disease management. That may be a myth. Kaiser Permanente’s July 2009 study indicates that 87% of seniors using their MyHealthManager online health record are satisfied.<sup>21</sup> The AARP Healthy @Home 2008 study indicated that 96% wanted to help their doctor monitor their health, and most people were willing to pay for technology – as long as the price was under \$50/month.<sup>22</sup> And the Philips-sponsored 2007 FAZZI study of 1000 home health aides validated that 97% of seniors like the equipment, wanted to keep using it



even after their episode of Medicare-funded caregiving has ended, even paying for its continued use.<sup>23</sup>

As Pramod K. Gaur, Vice President of Telehealth for United Healthcare, observed: “Solutions for patient/enrollees should fit their lifestyle. I travel everywhere, have my BlackBerry and carry my blood pressure monitor with me – I am good to go.”

- **Family caregivers manage care.** The first step of the calibrated care process may be family members who want to participate in a process where care can be supported more effectively in the home. When caregivers were surveyed in the AARP study, 79% of those caring for an individual who takes six or more prescriptions would be interested in using some sort of home monitoring; and more than 80% believed that personal health devices used by the person they care for could provide the caregiver with greater piece of mind.<sup>24</sup>
- **Professional caregiver manages or initiates care.** A range of professionals, from geriatric care management, to home care agencies, technicians, nursing services, and home health aides, are entering the home of seniors or those with chronic disease at a more frequent rate. This positions them to deploy technologies to help better manage a continuum of care – collecting data in the home to be transmitted to a central location with exceptions assessed by a provider. Or a primary care provider team in the ‘patient-centered medical home model’ could use a calibrated care process to handle most of the care requirements outside the office or hospital emergency room – again, recording actions to help identify needed intervention.

As Bonnie Britten of Roanoke Chowan Community Health, a primary provider similar to the VA, noted: “One of our patients had 11 emergency room visits in a 6-month period before we brought a telehealth unit to his home. In this case, we were able to keep it in his home for 9 months, during which time he had no hospitalizations. His comment: this was the first time he thought somebody cared.”

### **How Can Technology Support the Calibrated Care Process?**

Calibrated care depends on technology to support its decision-making steps, including these categories, detailed list of vendors at the end of document (see Figure 6):

- **Home telehealth.** This includes primarily vital signs, condition and activity monitors in the home. It also can include: wearable health-specific monitoring, nurse call devices – self-care, professional care, remote care, mobile care, devices to track wandering Alzheimer’s patients, etc. This worldwide market in 2010 is estimated at \$7.7 billion, a figure that includes kiosks, mobile carts, video consultation, individual remote monitoring of chronic diseases – like Ideal Life’s consumer-friendly



offerings.<sup>25</sup> Home telehealth technologies (particularly kiosks and video conferencing) have emerging uses near the home – in retail pharmacies, rural clinics and urban walk-in centers. For example, **Cisco** and United Healthcare’s announced a partnership to deliver a ‘Connected Care’ telehealth network for providers to extend care into rural areas using video conferencing and other technologies.<sup>26</sup>

- Medication management.** It is well known that the number of medications proliferates in relationship to age and chronic disease. Studies reflect \$290 billion per year for healthcare implications of medication non-adherence.<sup>27</sup> Furthermore, 1 in 10 visits to the hospital resulting from medication mismanagement. Vendors have numerous offerings, from simple phone-based reminders through cell phones and PDAs to removable canisters (**MedSignals**), dispensing devices (**Philips**) and even remote reconfiguration of dosages (**InRange Systems’ EMMA**).
- Internet-based services.** A Deloitte 2008 study of consumers and healthcare found that 80% of consumers want more Internet-based information about their medical records, test results, and information about treatments, but most don’t have this access. This has created an opportunity for the virtual doctor visit (e-mail and telephone) like **TelaDoc**, **HelloHealth** or **Zipnosis**, web-configured condition-specific monitoring like **Diabetesmine.com**, for profit sites, non-profit and chronic disease management sites. According to Alexa.com, there are more than 62,000 health sites received 55.3 million visits per month, 31% of the US audience.<sup>28</sup>

Categories To Support Calibrated Care		
Home Telehealth	Medication Management	Internet-based Services
Personal emergency response devices	Telephone-based reminders	Community websites
Passive remote monitoring with device integration	Electronic pill boxes	E-mail/chat/telephony
Dedicated telehealth remote monitoring, case management	Medication dispensing with remote monitoring	Disease management smart phone applications
Video conference call	Remote medication dosage management	Virtual doctor visit software
Mobile carts	Smart pills	Health platforms
Kiosks	Smart clothing	Social networking sites

**Figure 6 Three categories of technology enable Calibrated Care**



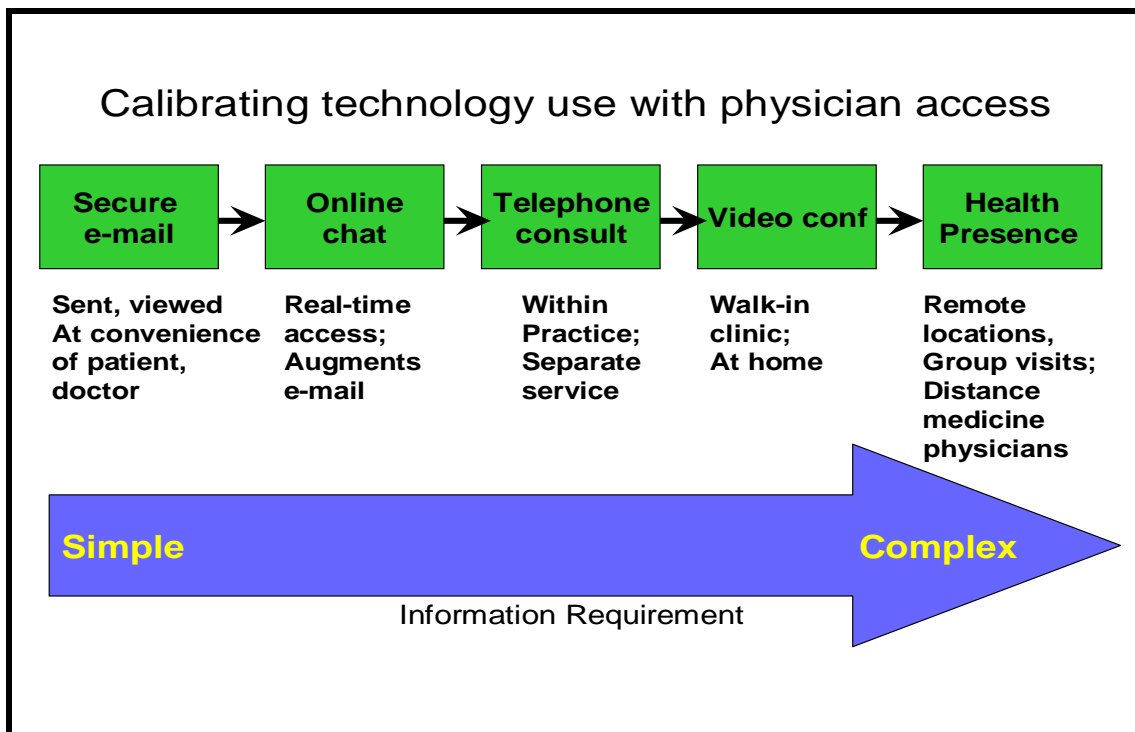
## WHY CALIBRATED CARE WILL BE MAINSTREAM BY 2020

The concept of calibrated care, matching appropriate tools and health care providers to the level of patient problem, seems like a no-brainer. And in vertically integrated health provider organizations, such a process is cost-effective and feasible, supporting it with shared information is likely, and willingness to participate is obvious. For the rest of us who are geographically unlikely to be served by them, by 2020:

- **Patients will vote with their feet and their wallets.** As the baby boomers become seniors taking their chronic conditions with them as they age, needless long drives and costlier Medigap insurance will encourage them to search for acceptable alternatives.<sup>29</sup> A recent Forrester survey of 4500 consumers already indicates that 40% cut healthcare spending in 2009.<sup>30</sup> They won't want to get into the car to have a sinus infection diagnosed or obtain a dosage change that could be monitored from within the home. Instead, insurance offerings, including Medicare, will use incentives to motivate them to try less expensive interactions as the first step in a process of care that brings them to the doctor's office or ER when really necessary.
- **Insurance providers of all types will view the home as a care location.** The cost of health care coverage and delivery is growing in inverse proportion to economic stability. As government and private pilot studies reinforce the long-ago conclusions of the Veterans Administration, remote monitoring of chronic disease will be the default approach, cutting down the numbers of visits to the office and ER, providing alternative practice and communication channels for doctors and other practitioners, and offering access to advice and care that will have become unaffordable and inaccessible otherwise.
- **Electronic record keeping will make calibrated care inevitable.** Although the initial and apparent focus of health IT investments today appear to be electronic medical records and personal health records, government infusion of cash will be the catalyst for innovation in numerous adjacent health-related technologies – particularly those that seamlessly interface with EMR and PHR software – and implementation of a CCR (Continuity of Care Record).<sup>31</sup> So with PHR, for example, vendors are popping up who sell adjacent disease management software and services that consumers will want – even after the Medicare home rehab periods have expired. For example, **the iPhone Apps Store** has a growing menu of application for use in the home and on the road. Expect the Android and BlackBerry smart phone health app offerings to be not that far behind.



- **Call center discipline will right-size the process, supported by just enough data.** Even with likely government incentives, migration to standard electronic health records is a glacial project and its direct connection to cost reduction is over-hyped or unknown. A calibrated care process that redirects interactions to the right level of cost and care cannot operate, however, without shared access to data. This does not mean rewriting all of the underlying systems, however. Instead, care participants will agree to a standardized interface like the CCR (Continuity of Care Record) to reformat, retrieve, and put back 'just enough' data in a secure, patient-authorized repository. One result: data gathered by telehealth systems could automatically adjust the Frequently Asked Questions (FAQ) to be more relevant.
- **Calibrated care gives technology vendors context for participation.** Technology vendors, whether they want to or not, generate part of the cacophony around health care today – with point solutions, devices, services and systems that appear interesting and useful, but out of context, not clearly seen as necessary -- today. With the world of calibrated care, tech offerings make sense, fitting into and embracing process steps that make them necessary and valuable (see Figure 7).



**Figure 7 Frames Physician Interactions by 2020**



## **WHO ARE THE VENDORS OF TECHNOLOGY THAT SUPPORT CALIBRATED CARE?**

The following *example-only* vendor listing of currently active vendors and is organized by technology category, suggests who will use it, and provides platform and contact:



Category	Sub-category	Purpose	Platform	Contact
<i>Home Telehealth</i>				
<b>Bosch Health Buddy</b>	<b>Home patient monitoring</b>	<b>Monitor status, educate patient</b>	<b>Appliance</b>	<b>Healthbuddy.com</b>
<b>Honeywell HomMed</b>	<b>Home patient monitoring</b>	<b>Monitor status, educate patient</b>	<b>Appliance</b>	<b>HomMed.com</b>
<b>Intel Health Guide PHS6000</b>	<b>Home patient monitoring</b>	<b>Monitor status</b>	<b>Appliance with transmit by Internet, 3G Cellular, phone</b>	<b>Intel.com/healthcare/telehealth</b>
<b>Philips TeleStation</b>	<b>Home patient monitoring</b>	<b>Monitor status, educate patient</b>	<b>Appliance, wireless device collection, transmit</b>	<b>Philips.com/healthcare</b>
<b>Viterion V200Telehealth Monitor</b>	<b>Home patient monitoring</b>	<b>Monitor status, educate patient</b>	<b>Appliance with wireless Bluetooth collection</b>	<b>Viterion.com</b>
<b>Zipnosis</b>	<b>Diagnostic app</b>	<b>\$25/doctor consultation</b>	<b>iPhone</b>	<b>Zipnosis.com</b>
<b>Vidyo</b>	<b>Remote doctor interaction</b>	<b>High definition video, touch screen at home</b>	<b>Video conferencing for doctors</b>	<b>Vidyo.com</b>
<b>IBM/Quantum PCMH</b>	<b>Medical information management</b>	<b>EMR-enabled primary care</b>	<b>Patient centered medical home</b>	<b>IBM.com, quantum.com</b>





Category	Sub-category	Purpose	Platform	Contact
<i>Home Telehealth</i>				
Health Anywhere	Mobile telehealth	Monitor chronic conditions	Smart phone, PC, portal	Healthanywhere.com
Ideal Life	Consumer-priced wireless devices	Individual devices for 5 chronic diseases	Bluetooth	IDEALLIFEonline.com
Cardiocom	Vital sign monitoring	Monitor CHF, COPD, Asthma, Diabetes, etc.	Proprietary device, telephone transfer	Cardiocom.com
Sonamba	Wellbeing monitor, medication, monitoring	Consumer elder sensor and wellness monitor	Wireless	Sonamba.com
Healthsense™ eNeighbor™	Passive remote monitoring including vital signs	Resident Monitoring CCRC	Wifi sensor network	healthsense.com
GrandCare Systems	Passive remote monitoring including vital signs	Resident Monitoring CCRC	Wifi sensors connected to a set top box	Grandcare.com
Halo Monitoring	Chest strap for fall detection	Resident Monitoring CCRC	Zigbee body sensor	Halomonitoring.com
Philips PT/INR Self Testing	Blood coagulation meter for Coumadin patients	Home testing	Device	INRselftesting.com



Category	Sub-category	Purpose	Platform	Contact
<i>Medication Management</i>				
Senticare.com	Pillbox with camera image of pills to verify accuracy	Home use	Appliance plus monitoring service and call center	Senticare.com
TabSafe	Multi-dose, multi day medication management	Assisted living facilities	Pharmacy-filled cartridges	Tabsafe.com
EMMA	Multi-dose, multi-day remote medication management	Home care agency for patient home use	Appliance programmed by pharmacist, wireless	Inrangesystems. Com
Philips Lifeline with Philips Medication Dispensing Service	Multi-dose, multi-day canister with dosage cups	Home care agency for patient home use	Appliance with telephone transmission	Lifelinesys.com
MedSignals	Medication dispenser and manager	Consumer, four drugs, voice instructions	Appliance with telephone transmission	Medsignals.com
GreatCall	Reminders, live nurse, wellness & check-in calls	Consumer and health plan	Mobile health platform	Greatcall.com
MedMinder Adherence System	Multi-dose, multi-day container with dosage cups	Consumer, four dosages, 28 compartments	Wireless pill container and notification	Medminder.com
iReminder	Automated reminder software/service	Phone, SMS text, email, iPhone calendar	Multiple	iReminder.com



Category	Sub-category	Purpose	Platform	Contact
<i>Internet Based Diagnostic and Care</i>				
Microsoft Health Vault	Platform for secure patient health information	Foundation for partner application and device connection	Uses Microsoft data storage, security	Healthvault.com
Mayo Clinic.com	Self-help care website	Medical and self-care information	Web	Mayclinic.com
WebMD	Self-help care website	Medical and self-care information	Web	Webmd.com
PatientsLikeME	Shared disease experiences	Sharing common disease management	Web social network	Patientslikeme.com
Diabetes Mine	Diabetes patients	Sharing, monitoring diabetes	Web social network	Diabetesmine.com
HelloHealth	Online consultation	Online access to a doctor	Virtual services	Hellohealth.com
ConsultADoctor	Telephone, e-mail doctor consultation	24x7 access to a doctor	Virtual services	Consultadoctor.com
TelaDoc Medical Services	Telephone doctor consultation	24x7 access to a doctor	Virtual doctor service	Teladoc.com
American Well system (participating health plans only)	web, phone, video doctor consultation	24x7 access to a doctor	Virtual doctor service	Americanwell.com



## Contributors

Erin Kinikin, Editor

## Sources

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Continua Health Alliance  
Cisco Health Presence  
ConsultADoctor  
HealthAnywhere  
InRange Systems  
IBM  
Intel  
GreatCall  
Healthsense  
Microsoft Health Vault  
Partners HealthCare Home Health  
Philips Lifeline  
Roanoke Chowan Community Health Center  
SeniorMed  
WellAWARE  
Zume Life

Plus:

Mark VanderWerf, former CEO AMD Telemedicine  
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Laurie M. Orlov, a tech industry veteran, writer, speaker and elder care advocate, is the founder of **Aging in Place Technology Watch**, a market research firm that provides thought leadership, analysis and guidance about technologies and related services that enable boomers and seniors to remain longer in their home of choice. In addition to her technology background and years as a technology industry analyst, Laurie is a certified long-term care ombudsman, certified in geriatric care management by the University of Florida, and the author of **When Your Parents Need Elder Care (Authorhouse, 2006)**. Her 2009 Aging in Place Technology Market Overview is available online at [www.ageinplacetech.com](http://www.ageinplacetech.com).

In her previous career, Laurie Orlov spent more than 30 years in the technology industry, including 24 years in IT and 9 years as a leading industry analyst at Forrester Research where she was often the first in the industry to identify technology trends and management strategies which have survived the test of time. She has spoken regularly and delivered keynote speeches at forums, industry consortia, conferences, and symposia. In 1996, Orlov was named to **McGraw-Hill/Open Computing's list of the top 100 women in computing**. She is a featured columnist on numerous websites about topics related to boomers and seniors. Learn more at [www.ageinplacetech.com](http://www.ageinplacetech.com).



## References:

<sup>1</sup> 2010 Market Overview at [www.ageinplacetech.com](http://www.ageinplacetech.com).

<sup>2</sup>[http://www.efluxmedia.com/news/CDC\\_Report\\_Emergency\\_Room\\_Visits\\_Up\\_by\\_26\\_Percent\\_in\\_a\\_Decade\\_21690.html](http://www.efluxmedia.com/news/CDC_Report_Emergency_Room_Visits_Up_by_26_Percent_in_a_Decade_21690.html)

<sup>3</sup> <http://www.ahrq.gov/research/elderdis.htm>

<sup>4</sup> “Health Care without the Doctor: How New Devices and Technologies Aid Clinicians and Consumers, California HealthCare Foundation,” Mary Kate Scott, M.B.A. , Scott & Company, Inc. ,2008  
<http://www.chcf.org/topics/view.cfm?itemid=133938>

<sup>5</sup> <http://www.medicalnewstoday.com/articles/155975.php>

<sup>6</sup> Group visit for diabetes patients: <http://clinical.diabetesjournals.org/content/26/2/58.full>

<sup>7</sup> AARP study

[http://bulletin.aarp.org/yourhealth/policy/articles/new\\_study\\_finds\\_fewer\\_doctors\\_visit\\_patients\\_in\\_the\\_hospital.html](http://bulletin.aarp.org/yourhealth/policy/articles/new_study_finds_fewer_doctors_visit_patients_in_the_hospital.html)

<sup>8</sup> According to a recent national survey of almost 1,000 home care agencies, only 17.1% reported that they presently use a telehealth system (Fazzi Associates, 2008)

<sup>9</sup> <http://edocket.access.gpo.gov/2010/2010-12647.htm>

<sup>10</sup> The Future of Home Health Care: Containing Costs While Serving Patient Preferences, The Alliance for Home Health Quality and Innovation, May, 2008  
[http://www.ahhqj.org/download/File/The\\_Future\\_of\\_Home\\_Health\\_Care.pdf](http://www.ahhqj.org/download/File/The_Future_of_Home_Health_Care.pdf)

<sup>11</sup> [Drugstores: What the Future Holds, Consumer Reports June, 2008](#)

<sup>12</sup> <http://www.ihealthbeat.org/articles/2008/8/22/Report-Online-Doctor-Visits-Can-Boost-Access-Concerns-Remain.aspx?topicID=57>

<sup>13</sup> For example, despite having similar patient populations to Medicare, only about half of state Medicaid programs currently reimburse for telemedicine (ICHP, 2005).

<sup>14</sup> <http://health.usnews.com/health-news/best-hospitals/articles/2010/07/21/health-reform-takes-aim-at-hospital-readmission-rates.html>

<sup>15</sup> Case Report, Care Coordination/Home Telehealth: The Systematic Implementation of Health Informatics, Home Telehealth, and Disease Management to Support the Care of Veteran Patients with Chronic Conditions, Darkins, Ryan, Kobb, Foster et al, Revised February, 2008

<sup>16</sup> <http://www.aafp.org/fpm/20071000/20virt.html>.

<sup>17</sup> <http://www.healthnewsdirect.com/?p=61>



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<sup>18</sup> <http://www.ama-assn.org/amednews/>

<sup>19</sup> Finkeelstein J., Cabrerra, M.R., Hripcsak, G. "Internet-based home asthma telemonitoring: Can patients handle the technology?" *Chest* 2007;117(1): 148-155.

<sup>20</sup> Aetna and Cigna are now reimbursing for 'e-visits'.  
<http://wcbstv.com/local/online.doctor.visits.2.689285.html>

<sup>21</sup> Kaiser Permanente surveyed 4560 seniors about their comfort using computers, Internet use habits, health status, including prescriptions and chronic conditions. [Kaiser Permanente Survey, July 2009](#)

<sup>22</sup> Healthy @ Home Using Technology to Remain Independent. Linda L. Barrett, Ph.D Washington, D.C.: AARP Foundation, 2008

<sup>23</sup> For example, one call center is NHS Direct in the UK -- a 24/7 Nurse call center. It has taken millions of calls and is credited with addressing minor and after-hours issues reducing pressure on ERs and physicians.

<sup>24</sup> Healthy @ Home Using Technology to Remain Independent. Linda L. Barrett, Ph.D Washington, D.C.: AARP Foundation, 2008

<sup>25</sup> Datamonitor estimated in 2007 that the home telehealth Worldwide \$8 market billion by 2012;  
<http://www.healthcareitnews.com/news/global-telehealth-market-will-expand-report-claims>

<sup>26</sup> Wall Street Journal, July 15, 2009, <http://online.wsj.com/article/BT-CO-20090715-716701.html>

<sup>27</sup> New England Healthcare Institute, <http://bit.ly/b6jGJ>

<sup>28</sup> Health Care Without the Doctor, How New Devices and Technologies Aid Clinicians and Consumers, Mary Kate Scott, California HealthCare Foundation, 2008

<sup>29</sup> The CDC and NIH survey of 23,000 American adults revealed \$34 billion per year is spent on alternative therapies that are not covered by insurance, including acupuncture, herbs, and yoga, up 25% from last year.  
[http://www.usatoday.com/printedition/news/20090731/a\\_cam31\\_st.art.htm](http://www.usatoday.com/printedition/news/20090731/a_cam31_st.art.htm)

<sup>30</sup> Customers Delay Healthcare Due to Economic Woes, Elizabeth Boehm, Forrester Research, March 25, 2009, <http://www.forrester.com/Research/Document/0,7211,53887,00.html>

<sup>31</sup> <http://www.ccrstandard.com/learnabouttheccrstandard>