Aging in Place Technology Watch

Calibrated Care is Closer to Home:

2012 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 $2.6 trillion in 2010 or 17.9% of GDP, expected to reach 19.8% by 2020 or $4.64 trillion.[1] Despite the passage of the Health Care Reform Bill in 2010, there is still little general agreement on how to contain costs overall. But 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, including use of technology, 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 2012 Market Overview.[2]   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, the past few years will be remembered as the years 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 (18.2% as of 2011). Add the 7.8% annual Medicare and Medicaid cost growth and the dire forecasting of a future funding crisis resulting from an aging population (see Figure 1). Now you have a recipe with pressure and opportunity for change – beyond even the recent government action.
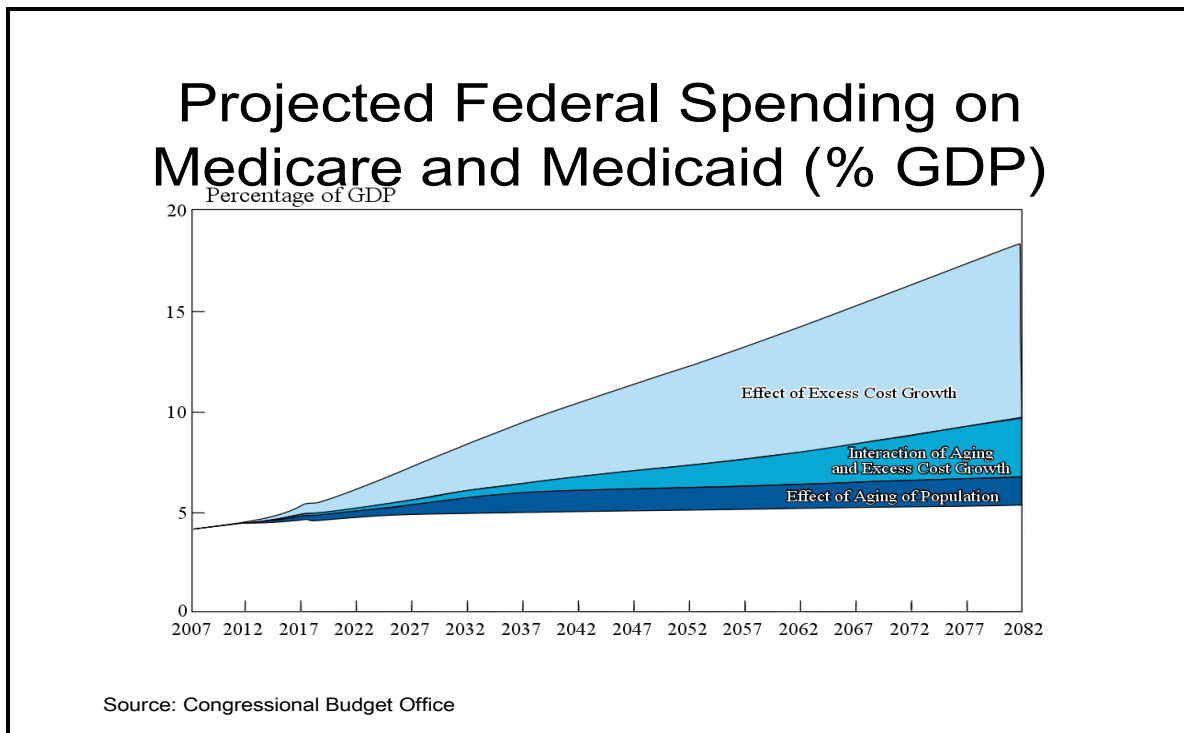

Figure 1 Projected Federal Spending on Medicare and Medicaid

- **ER visits depend on fixed infrastructure and generate large and avoidable cost.** There were 136 million trips to emergency rooms in 2009, but two-thirds were not 'emergencies', according to the Center for Disease Control.[3] Moreover, one in four were 65 or older.[4] 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

$1300 in cost (compared to $200 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 (see Figure 2).[5] 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.
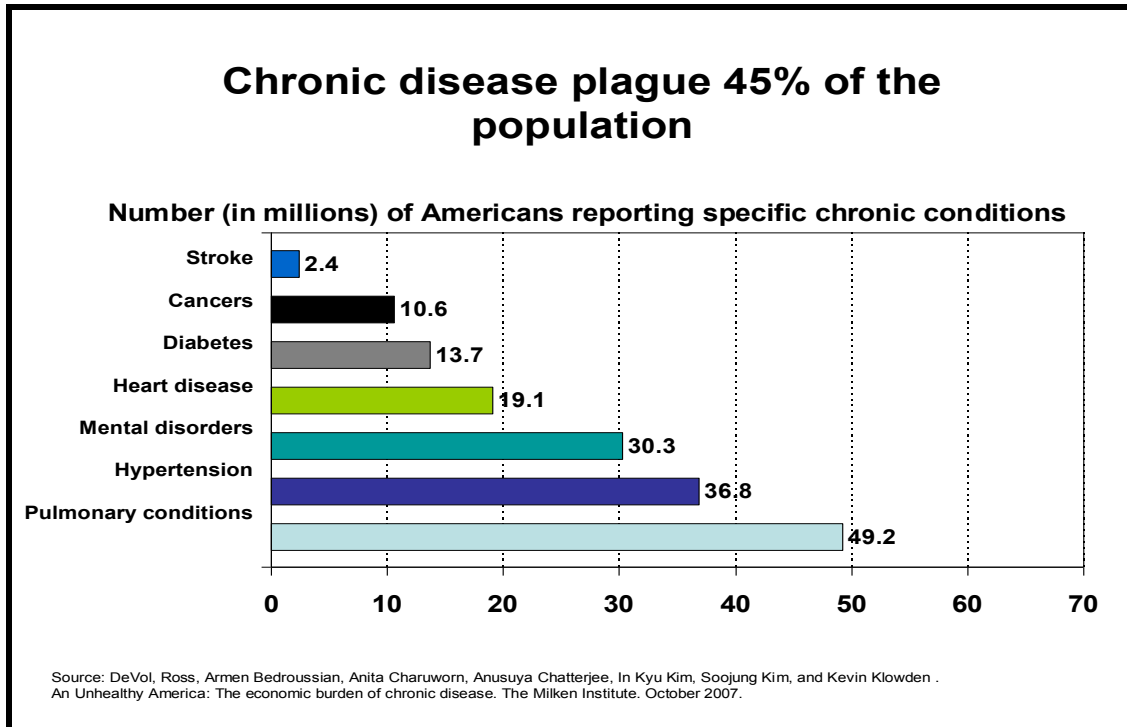
Chronic disease plague 45% of the population

Number (in millions) of Americans reporting specific chronic conditions

Condition	Value
Stroke	2.4
Cancers	10.6
Diabetes	13.7
Heart disease	19.1
Mental disorders	30.3
Hypertension	36.8
Pulmonary conditions	49.2

Source: DeVol, Ross, Armen Bedroussian, Anita Charuworn, Anusuya Chatterjee, In Kyu Kim, Soojung Kim, and Kevin Klowden . An Unhealthy America: The economic burden of chronic disease. The Milken Institute. October 2007.

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 continues to be 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 and on the road.** In 2010, the global market for home blood pressure monitors passed $1 billion, home glucose monitoring $7 billion.[6] 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. And more than two dozen companies including large-scale providers like Philips, Honeywell, Bayer, Bosch, and Care Innovations (spun off from Intel and GE), offer comprehensive home monitoring solutions. In addition, standalone solutions including home blood pressure cuffs, diabetes monitors, scales for tracking weight, and even home defibrillators are being marketed today, combined with new applications for smart phones and tablets. Meanwhile, the multi-billion mobile health market is mushrooming right along with the growth in smart phone and tablets.[7]

- **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.[8] 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. Walk-in Urgent Care centers have ballooned to 8700 today. And with recognition of the inefficiency of the 1-1 doctor check-in visit, counseling for diabetes patients is now offered within group visits.[9]

- **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/ transition instructions, medication errors, lack of follow-up appointments, and risk of re-admission.[10]

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, walk-in centers, hospitals, and nursing homes. Thirty percent of doctors now have iPads, according to Manhattan Research.[11] And patients who use secure e-mail with doctors report better managed chronic conditions.[12] Meanwhile, hospital and physician interest in home and remote management of chronic disease is growing, but adoption of telehealth is still limited:[13]

- **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 is still evaluating efficacy and does not endorse or encourage the use of telehealth care delivery, instead proposing changes to telehealth credentialing.[14] This is despite proof points from organizations that managing care in home settings supported by technologies is feasible, available, and works.[15]

- **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.[16] 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.[17]

- **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).[18] With the Health Care law (ARA) in effect in 2012, readmissions of Medicare patients within 31 days of discharge will be subject to payment penalty.[19]

- **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.[20] 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:[21]

- **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).

VA Telehealth Study Proved Reduction in Hospitalization

LOCATION	# PATIENTS	% Decrease in Utilization
Urban	9,880	29.2
Rural	6,782	17
Highly Rural	294	50.1

CONDITION	# PATIENTS	% Decrease in Utilization
Diabetes	8,954	20.4
Hypertension	7,447	30.3
Chronic heart failure	4,099	25.9
COPD	1,963	20.7
Single condition	10,885	24.8
Multiple conditions	6,140	26.0

Notes:
•Mean age at study enrollment in 2006 was 65 years, 96% male
•Not all conditions shown

Source: Veterans Administration VHA Care Coordination/Home Telehealth

Figure 3 Telehealth Study Proved Reduction in Hospitalization

- **Kaiser Permanente proves the cost-saving benefits of e-mail.** 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%.[22] The organization in some regions reimburses the doctor $50 for a virtual 'e-mail visit' and uses pre-visit e-mails to cut time used (and perhaps wasted) in face-to-face visits. Despite that study and others, physician adoption of e-mailing with patients remains low – as of 2008. the most recent data available, only 6.7 percent of office-based physicians routinely e-mailed patients.[23]

- **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 care from doctors who practice across state lines – making licensing easier for telemedicine doctors.[24]

- **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.[25] 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.[26]

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 technology was used for matching the right care to need:

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, on a smart phone, or on a tablet.

- **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 process steps. This securely managed 'just enough' data, not necessarily a full Electronic Medical Record (EMR), 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. If needed, that data can be used to retrieve a more detailed history, likely to be broadly implemented within the next few years.

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):
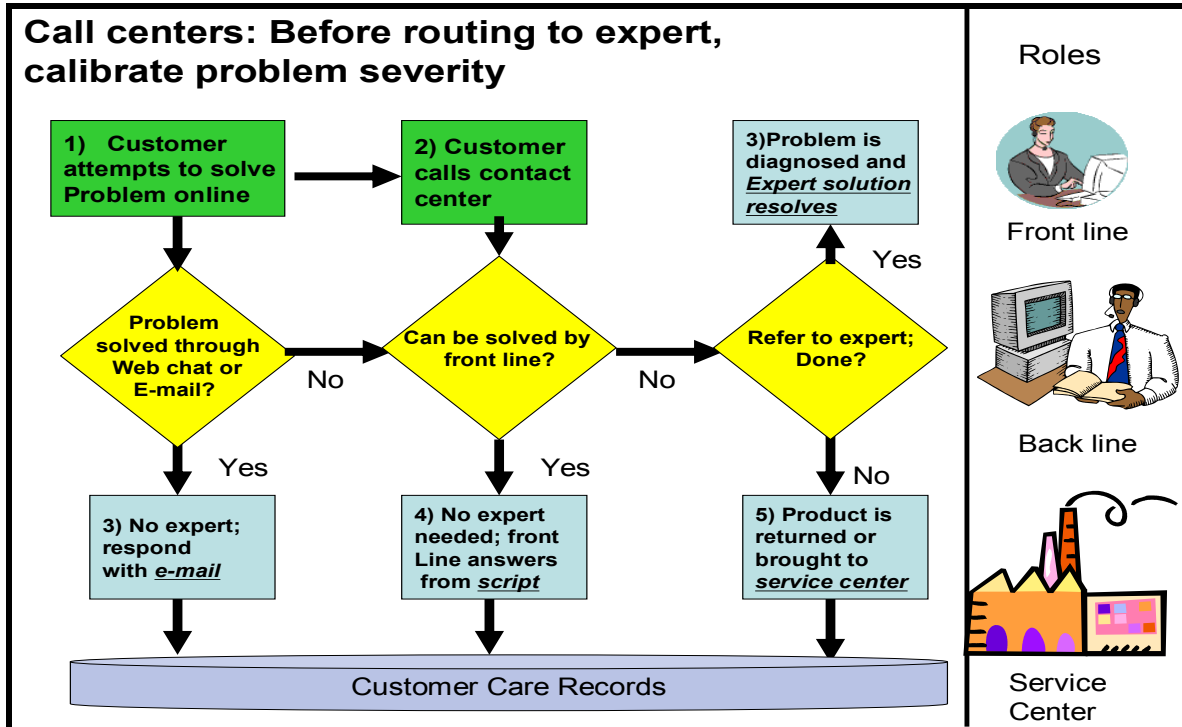
Figure 4 Call centers calibrate severity, then route to expert

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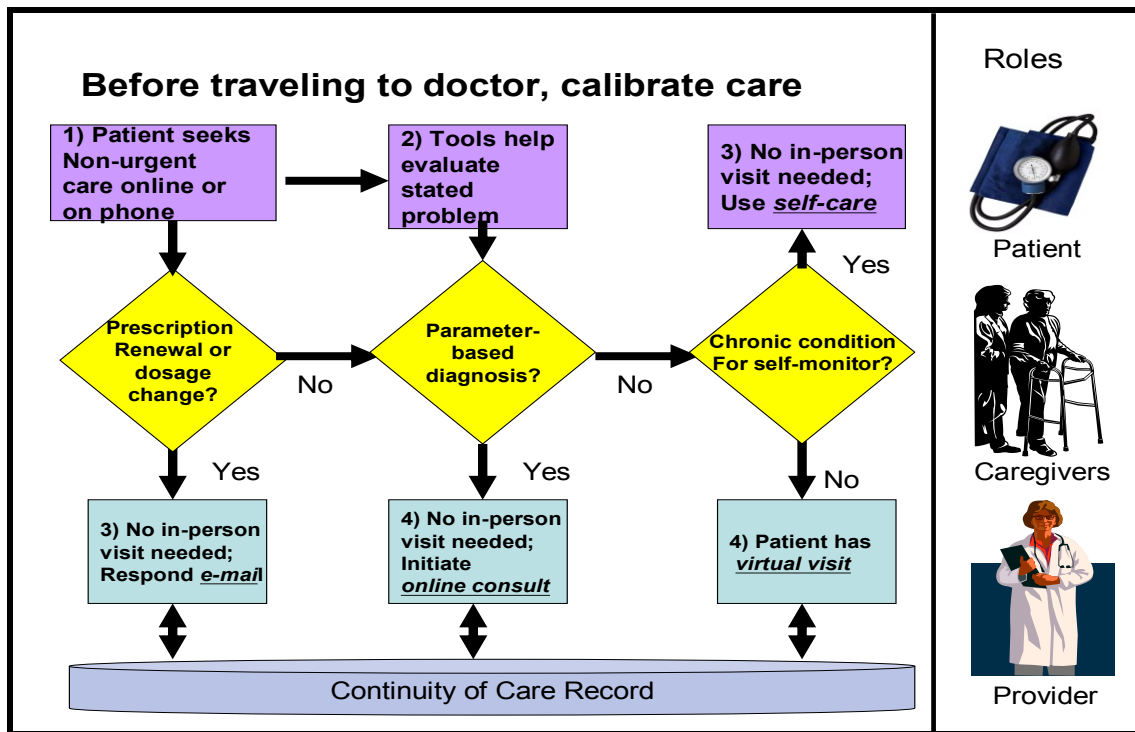
Figure 5 Decision-making processes to calibrate care

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, reducing trips to the ER. 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.[27] The AARP Healthy @Home 2010 survey indicated that 60% of older people were willing to pay for technology – as long s the price was under $50/month.[28] 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.[29]

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 2008 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.[30] Interestingly, willingness to use (and pay for) technology has declined somewhat between the 2008 and 2011 reports, possibly in proportion to the economic decline between the previous and current surveys.[31]

- **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, many of which offer smartphone and tablet versions, enabling them to be used either in home or on the road (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 was estimated at $7.7 billion, a figure that includes kiosks, mobile carts, video consultation, individual remote monitoring of chronic diseases.[32] 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.[33]

- **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.[34] 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**), dose dispensing devices **(Philips)** and even remote reconfiguration of dosages **(InRange Systems' EMMA)**. And 36% of office-based physicians surveyed in 2010 now use e-prescribing (versus print or fax) to send prescriptions to pharmacies.[35]

- **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.[36]

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.[37] A 2011 Deloitte study of consumers indicate that their health related spending has jumped.[38] 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 steadily climbing numbers of visits to the 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. [39]

- **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).[40] 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.

- **The mobile phone is poised to deliver mobile advice.** In 2010, according to Pew Research, 15 percent of 18- to 29-year olds had a mobile health app on their phone compared to 8 percent of 30- to 49-year-olds; 6 percent of 50- to 64-year-olds; and 5 percent of people 65-years-old and older.[41] **GreatCall,** founder of the Jitterbug phone, offers 7 different health-related services today. And **the iPhone Apps Store** has a growing menu of application for use in the home and on the road. With smart phone ownership reaching 35% of boomers and seniors, expect the Android and BlackBerry smart phone health app offerings to be not that far behind.[42]

- **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).
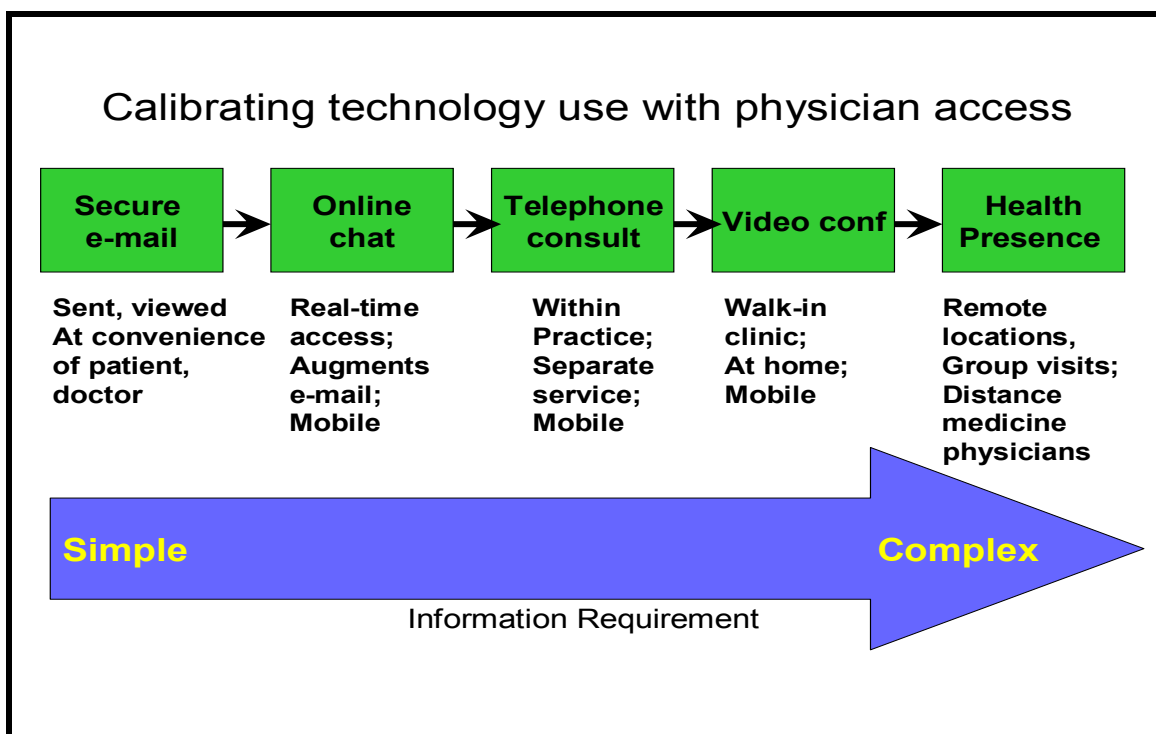
Calibrating technology use with physician access

Secure e-mail	Online chat	Telephone consult	Video conf	Health Presence
Sent, viewed At convenience of patient, doctor	Real-time access; Augments e-mail; Mobile	Within Practice; Separate service; Mobile	Walk-in clinic; At home; Mobile	Remote locations, Group visits; Distance medicine physicians

Simple → **Complex**

Information Requirement

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

Category	Sub-category	Purpose	Platform	Contact
Home Telehealth				
Biosigns Healthanywhere	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
MedApps HealthPAL	Remote patient monitoring	Transmits readings from devices to EHR	Wireless home health monitoring	Medapps.com
Philips PT/INR Self Testing	Blood coagulation meter for Coumadin patients	Home testing	Device	INRselftesting.com

Category	Sub-category	Purpose	Platform	Contact
Medication Management				
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	In-home medication dispensing	Reminder, alerting, dispensing	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, e-mail, iPhone calendar	Multiple	iReminder.com

Category	Sub-category	Purpose	Platform	Contact
Internet Based Diagnostic and Care				
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

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Sources

Advanced Warning Systems
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
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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.

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.

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