MONITOR GROUP

Telemedicine

SCENARIOS AND IMPLICATIONS

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Telemedicine is poised to create a significant impact on the way patients are diagnosed, monitored and treated. It is also going to play an important role in keeping the population healthy in the future. That is the conventional wisdom and there is no reason to dispute it.

However, it is not clear exactly how the "game will be played out". The technology may be accessible, but the various players may not be willing to adopt it and standards that would allow seamless integration may not exist (e.g., physicians having global versus state specific licenses). There are too many stakeholders with differing agendas and too many barriers. To further complicate the matter, the future development of telemedicine will depend on many factors, some within the control of its stakeholders and some not within their control.

Telemedicine is going to play an important role in keeping the population healthy in the future.

To say that the roadmap of telemedicine is uncertain, and its promises are hard to fathom, is of little solace to organizations and companies that need to place their bets now. There are opportunities that can change the fortunes of an organization and risks that can equally and swiftly erase it. How well the opportunities are exploited and how effectively the risks are managed depends to a great extent on the actions that are taken now, just as Telemedicine seems poised to take off. One can not wait for the events to unfold before making crucial decisions.

Predicting how telemedicine will develop, what are the implications of its development, and what are the best ways to respond is similar to constructing a jigsaw puzzle. The Monitor Group, in partnership with Financial Times, is initiating a program to help senior members of the stakeholder community arrange these pieces together to produce a clear picture and actionable results.

The first event of this program was an interactive workshop, in which the pieces of the puzzle were examined and the alternative ways in which they could fit together were discussed. The following is a summary of the insights gained and progress achieved.

Workshop

We conceived, designed, and conducted a workshop titled "Implications of Telemedicine" at Monitor's Cambridge, Massachusetts office on May 15 and 16, 2006. We convened a very diverse group of participants to look at the future of telemedicine, describe alternate scenarios along which it can develop, create roadmaps, and study what the implications may be in terms of opportunities and risks to various stakeholders. The participants were taken through several structured steps, creating a view of telemedicine from various perspectives, and collectively building upon each other's ideas. The results were captured by a graphic artist, as well as, recorders. This paper summarizes the collective judgment of the group on the scenarios and implications of Telemedicine.

What is Telemedicine?

There was a serious debate over the definition of Telemedicine and some speculation that the term itself is misleading or even incorrect.

Many believed that Telemedicine includes features like real-time remote monitoring and overall improved information gathering and dissemination. The electronic transport of healthcare information for a multitude of purposes is commonly accepted as one definition of Telemedicine, but it leaves many questions unanswered. For example, what is the scope? Where does Telemedicine begin and end? It remains a gray zone with few standards.

The group agreed that Telemedicine is healthcare delivered via electronic means, be it telephone, email, video conferencing, or other electronic forms. Concensus was also reached that Telemedicine is not informatics or a Web-MD type of forum where patients educate themselves on a medical procedure through the internet.

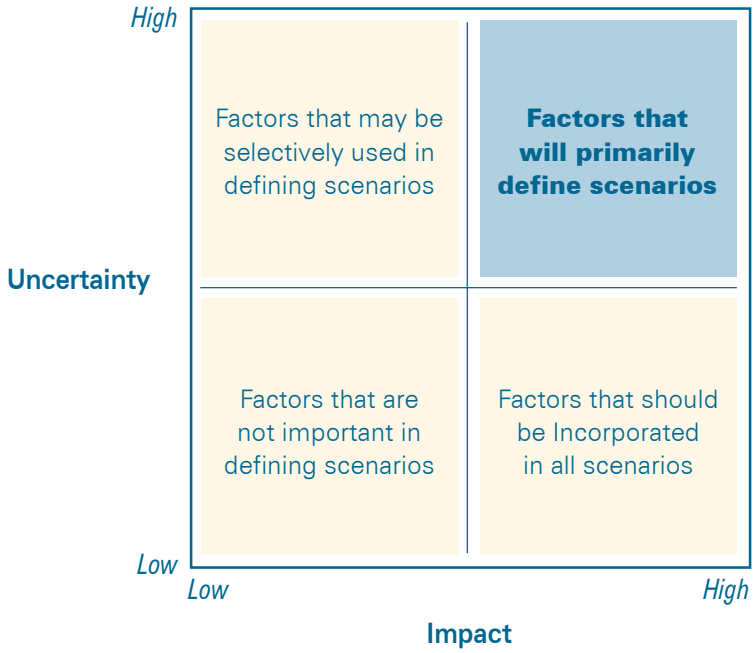
Factors Affecting Telemedicine's Development

There are many factors, ranging from logistical to emotional, that will affect the development of Telemedicine in the future. The table below identifies the factors the group thought were particularly noteworthy.

Factors Affecting the Future Development of Telemedicine

- How strongly patients react to 10 minutes in the doctor's office for health check visit
- The level of comfort with technology
- The influence of Generation Y (which has always been wired)
- How companies respond to the burden of healthcare costs
- How the costs are reimbursed
- The level of information sharing (spurred by Customer Directed Healthcare)
- The credentials of the provider
- Legalistic licensing
- The shortage of trained staff
- The sophistication and evolution of sensor technology, reliability, and sensitivity
- The fact that the patient does not have to see the doctor
- How quickly Medicare moves to a risk based policy
- Legislation for change
- Privacy and security issues
- Leadership (where will it emerge from a large corporation? government? coalition? etc.)
- Use of true cost/value/outcome measures
- Politics (will either feed or starve telemedicine)
- Other countries (developing centers of excellence)
- Pandemic (will impact acceptance)
- Rate telemedicine is integrated into healthcare educational system
- Private industry support (could be a retailer or supply side of telemedicine)
- Broadband availability
- Clinician's view on effectiveness
- Job security concerns
- Cultural obstacles (resistance to commoditization of services)
- External disruptor

To determine the degree of influence these factors may have on Telemedicine, we used the scenario planning technique of ranking each of these factors along two axes; first, the degree of impact it will create on Telemedicine and secondly, what is the level of uncertainty surrounding it. Then, the following chart was used to identify factors for defining scenarios.



One overarching factor affecting telemedicine will be which patient segments are likely to embrace the notion of receiving care from someone not in their vicinity. To this end, the emergence of Generation Y will play an important role. This generation has grown up in an age where everyone is constantly on line, wired, and affiliated with virtual communities. For them telemedicine is just another extension of their electronically connected world. So what if the doctor providing care is on the other side of the world?

Another factor is the level of penetration of Customer Directed Healthcare (CDH). The patients selecting this way of managing healthcare are not only going to be more aware of the cost of diagnosis and treatment—they may end up paying some of it out of their pockets—but also more willing to share the information. Both these factors are essential elements of Telemedicine. The reimbursement policy regarding Telemedicine, particularly by Centers for Medicare and Medicaid Services (CMS), will also play an important role in the emergence of telemedicine.

We also expect that the private industry is going to play an important role in how quickly Telemedicine emerges. These players will include not only the obvious ones (e.g. the large consumer electronics, telecommunications, computer, and software firms), but also "big box" retailers like Wal-Mart with their extensive reach into the population at large. How quickly a big gorilla jumps in and creates disruption is an important and uncertain factor. Disruptions may also occur on the demand side, caused by a pandemic or by companies taking radical actions to manage rising healthcare costs.

Factors, such as the rise of Generation Y, which are likely to create major impact, but have low (no?) uncertainty associated with it, are intrinsic to all the scenarios. On the other hand, the CMS policy for reimbursement and a disruption caused by a major supply or demand side event, can create large impact and have a high degree of uncertainty. These make them prime candidates for the building blocks of a scenario. As it turns out, these two factors were indeed selected for developing the following scenarios.

Three Scenarios

The workshop participants created three potential scenarios in Telemedicine. They included:

Scenario A "From Mars to Mainstream" incremental changes to the existing landscape in Telemedicine through the year 2012, somewhat technology driven

Scenario B "Disruption" based on a disruptive move on the supply or demand side

Scenario C "MediPare", a reimbursement-related, financially-driven scenario centered around CMS reimbursing the Telemedicine costs.

What would we experience in each of scenarios, and what would it mean for Telemedicine? We portrayed each scenario by painting a picture of each in terms of the overall structure of telemedicine, opportunities and risks for different stakeholders, and likely the roadmaps.

Scenario A: FROM MARS TO MAIN STREET

The incremental evolution scenario, named by the group "From Mars to Main Street", encompassed a future where Telemedicine plays a fundamental role both in a mission to Mars (NASA is a great proponent of telemedicine for obvious reasons) and on Main Street.

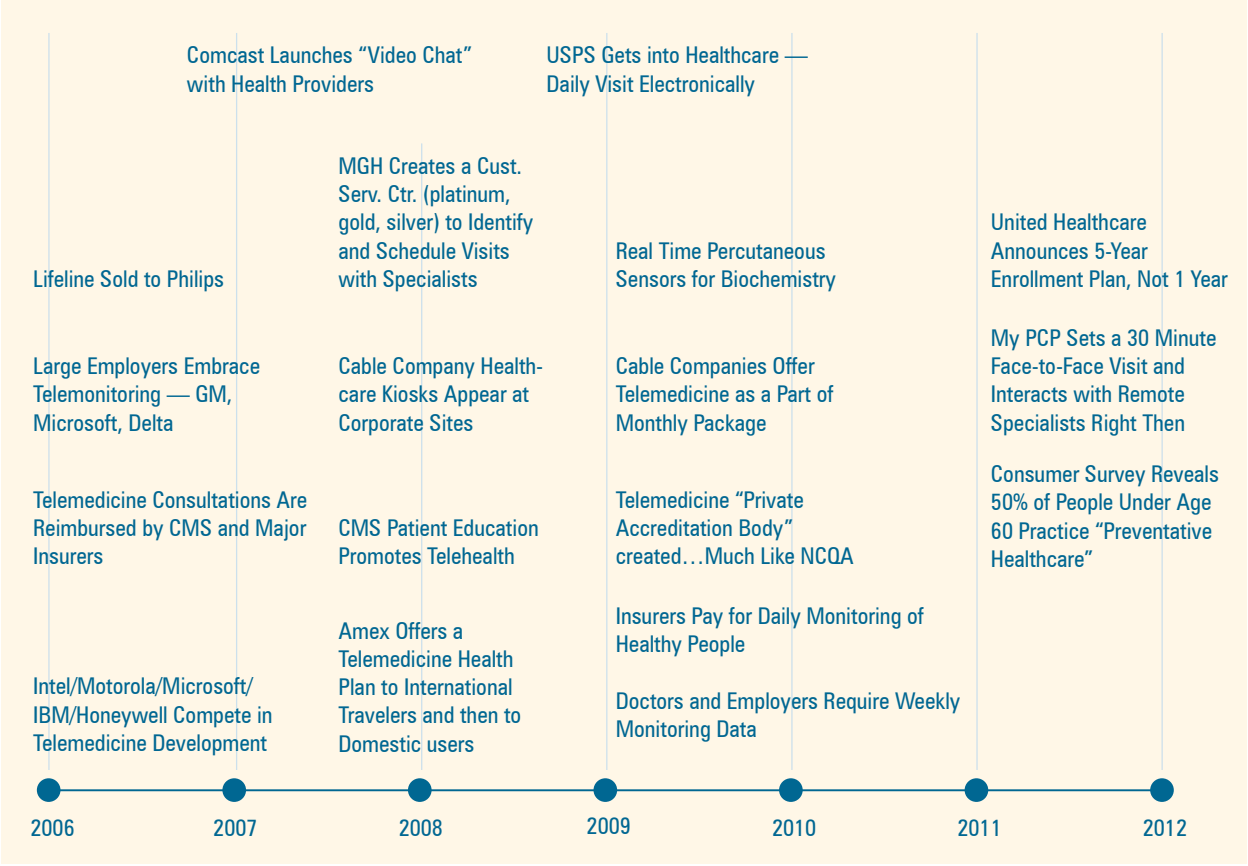
This will be an inexorable move from the present, where the foreign countries will take a lead. Examples are Korea, where cell phones are already in use for a wide variety of applications and the entire population behaves like our Generation Y, or India, where there is a huge need for medical care in the rural areas and where there are few regulatory constraints.

The United States will, of course, not be far behind. The impact of Telemedicine will be felt across the socio-economic boundaries and in rural, as well as, urban areas. The baby boomers will have money, need health management, and not be concerned about out-of-pocket expenses. People will be more educated on their own health and will avoid going to hospitals unnecessarily. They will realize and accept that home is a better place to receive healthcare. Disease management services and corporate health programs will be implemented to make healthcare more efficient and effective. All this will lead to a dramatic decrease in the cost of care.

Roadmap for Scenario A: From Mars to Main Street

Here is how we expect the scenario to unfold…major events and actions.

Telemedicine Roadmap Under Scenario A



Implications of Scenario A: From Mars to Main Street

This scenario will bring new opportunities and risks to the healthcare stakeholders, as stated below.

Opportunities and Risks Under Scenario A	
Healthcare Recipients/Patients Opportunities Increased involvement in care, peace of mind, decreased cost, improved access, improved education, better quality, better health stats, transparency for patients on their own health, real-time care	**Patient Risks** Too much reliance on the system, rate of technological adoption, possibility of decrease in quality, can't sue offshore physicians, afraid of giving up privacy (what if my health prevents me from getting insurance?)
Hospitals Opportunities Better patient management Decrease workload in ER, increased revenue-managed care capitation, earlier discharge and therefore increased revenue, increase in referral bar, decrease in length of stay	**Hospital Risk** Decrease in admissions Potential loss of revenue, decrease in profits Investment in equipment
Doctors/Practitioners Opportunities Increase patient contact through monitoring Increase number of remote patients **Insurers** Decrease costs More clients, improved preventative care	**Doctors Risks** Reimbursement risk, risk of liability, reduction in local patients **Insurance Risks** Increase volume/increase costs… telemed is an investment, what costs can be lowered, especially if people buy insurance every year.

Scenario B: DISRUPTION

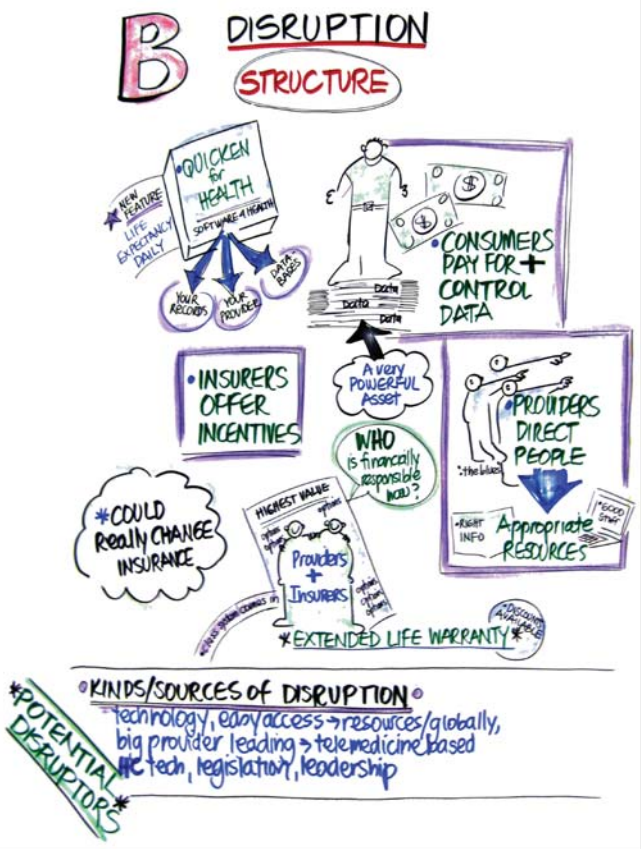
In this scenario a disruptive move is made by a corporation or other entity and has a dramatic impact. The disruptor could be a Wal-Mart, a Microsoft, or a Google. One can envision a "Medigoogle" or a "Telegoogle". The disruption can come from the supply side or the demand side (caused by a pandemic—the Avian Flu). China can jump into it with both feet and cause a major boost. The rationale being that Telemedicine is looking for a tipping point and under this scenario a major event or move by a major player provides the tipping point.

The results will be similar to the previous scenario, only faster. There will be automated sensing, monitoring, and tracking of patient status. "I get up in the morning and exercise and all data are recorded. It will be transmitted on cable

and I will be asked if I need an appointment. 'Sicken' software will be available to keep track of my health parameters just the way 'Quicken' does for financial ones." (Perhaps NSA will be involved!) Artificial Intelligence will be used to filter data and diagnose some conditions.

Like private banking, there will be different options available for different payment schedules. A higher service schedule will allow remote examination by an experience doctor at Massachusetts General Hospital; a lower one will shift the responsibility to someone in India. Routine physicals will be done at BJ's with data transmitted to your physician and any abnormalities will be flagged. Chronic illnesses will be monitored at home.

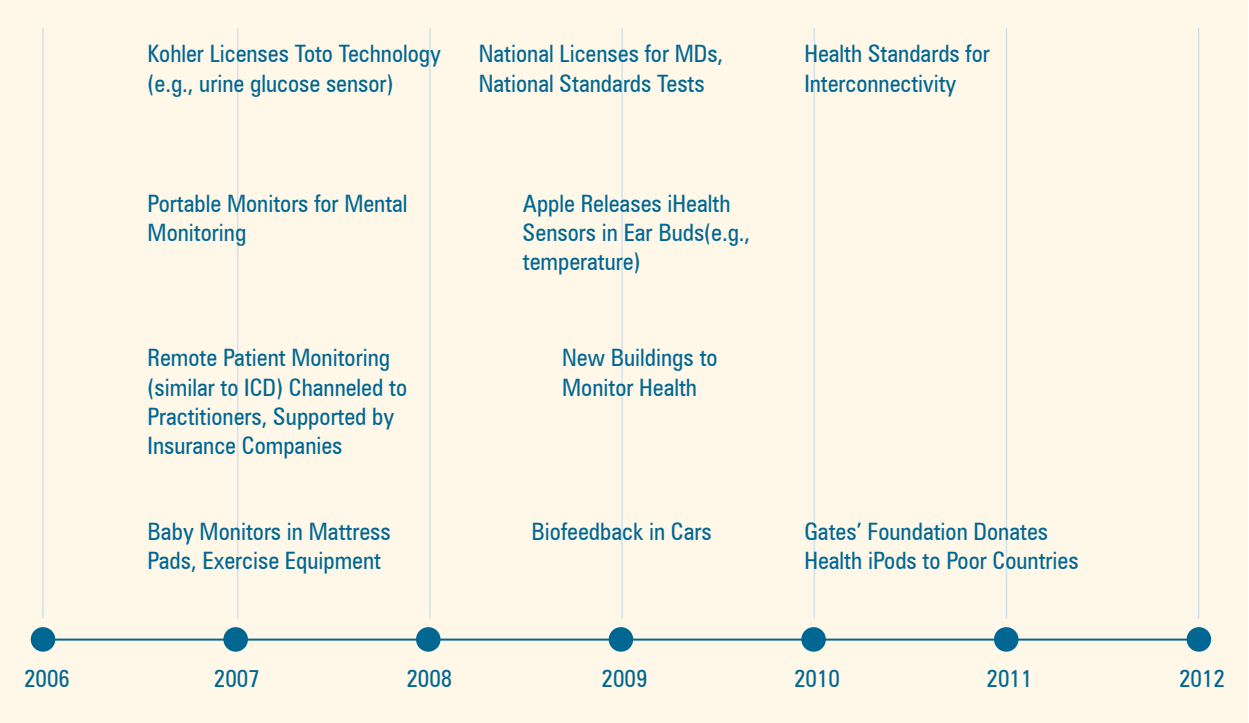
There will be a system that directs patients to the appropriate resource considering effectiveness, cost reduction, etc. Essentially, the providers and insurers will offer an "extended lifetime warranty" with delivery by the highest value resource on a worldwide basis. The health insurance structure will change to resemble that of dental, pre-paid insurance.



Roadmap of Scenario B: Disruption

The following figure highlights some of the events and actions that are likely to take place as the scenario unfolds.

Telemedicine Roadmap Under Scenario B



Implications of Scenario B: Disruption

Described in the following table are perspectives of various stakeholders under this scenario.

Perspectives of Stakeholders under Scenario B

Patients' Perspective

Too much, too weird-leave me alone (Non-Gen Y)

Gen-Y loves the access to resources, timeliness, complete info.

Peace of mind in taking care of older parents living alone

Choice, convenience, control…it's about time

However, will miss human interaction

Payor/Insurer Perspective

Show me the money, cost savings, differentiation share and price

Possible new lines of business: selling data, providing new wellness programs

Provider: Physician, Nurse Perspective

Great new opportunity, less commuting time, money, hours

Less hands on interaction

Efficiencies lead to early adoption

Liability may go up or down, depends on legislation

More medicine, less administration

More control of time

Insufficient, reimbursement not being made up by volume

Technology Company Perspective

Amazing opportunity, confirming that technology is needed for a great future and always will be

Slow consumer acceptance

At risk for malpractice

Business model issue in getting providers involved

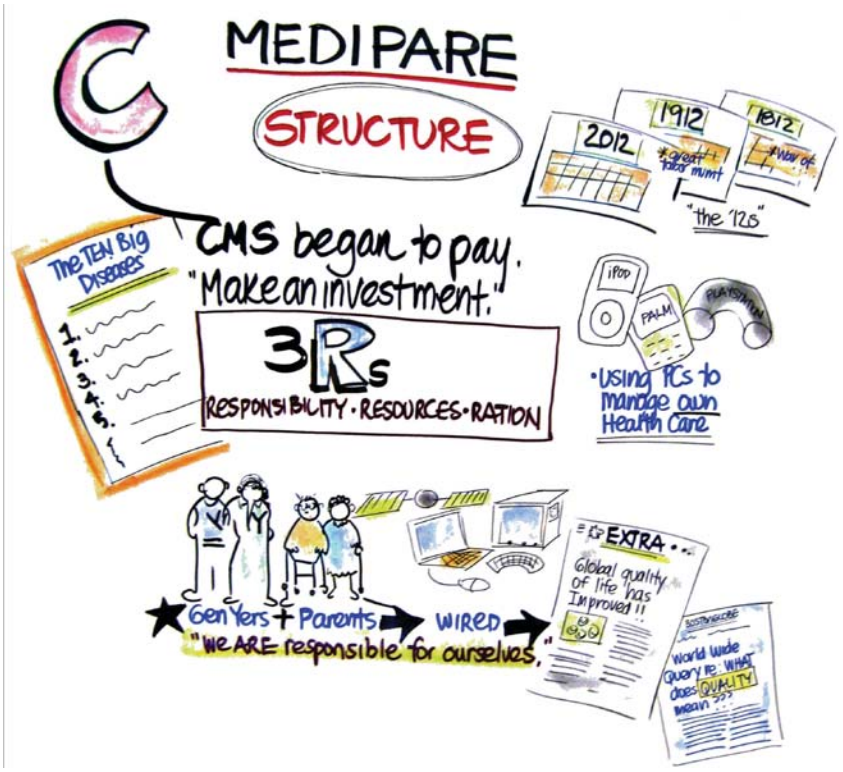
The Table below describes opportunities and risks under Scenario B. As can be seen, some of the factors, such as liability, appear both under opportunity and risk. The eventual outcome will depend on actions (e.g., regulations) that are not in the stakeholder control, and others that are.

Opportunities and Risks under Scenario B

Stakeholder	Opportunities	Risks
PATIENT	Improved access (information and doctors)	Could increase costs
	Education/Information	Need to take more responsibility
	Better health, control, choices and convenience	Managing money on healthcare
	Better wellness	Loss of privacy
	Can save money	Missed diagnosis
	Reduce ER time	Lack of relationship with physician
PROVIDER Physician/Nurse	More data/ history	Fewer patients, less money
	Increased physician productivity	Can increase liability
	Added resources	Less direct patient interaction
	Connected to patients, who are more educated	Validity/accuracy of data
	Can decrease liability	System learns faster than provider
	Teleconference could mean office consult fee	Loss of patient control
	Pay for performance, chance to change more for better service	Less business, global competition
	More continuous patient tracking-pick up subtle changes in health status	
PHARMA DEVICE	Increased revenue	Will need to deal with new partners and have new skills:
	Excitement due to new market growth	Best Buy (retail)
	Sell more big drugs	Apple (user interface)
	DTC via new technology	P&G (branding)
	How can I use telemedicine to brand new Rx?	How do I support customers? Who pays for their support, i.e. call centers?
	"Move over iPod"…new devices for remote healthcare	If devices have interoperable systems, how do I protect my IP?
	New business models	Lack of capability; No experience in retail/consumer/brand systems?
		Product development usability
		Regulatory nightmare/product liability
		Making profit dependent on external system, out of business control
INSURANCE PLANS	Telemedicine will be a boon my business	Will I get preferred patients?
	Will this be another Part D – a chance to get 40 million new subscribers	Political backlash

Scenario C: MEDIPARE

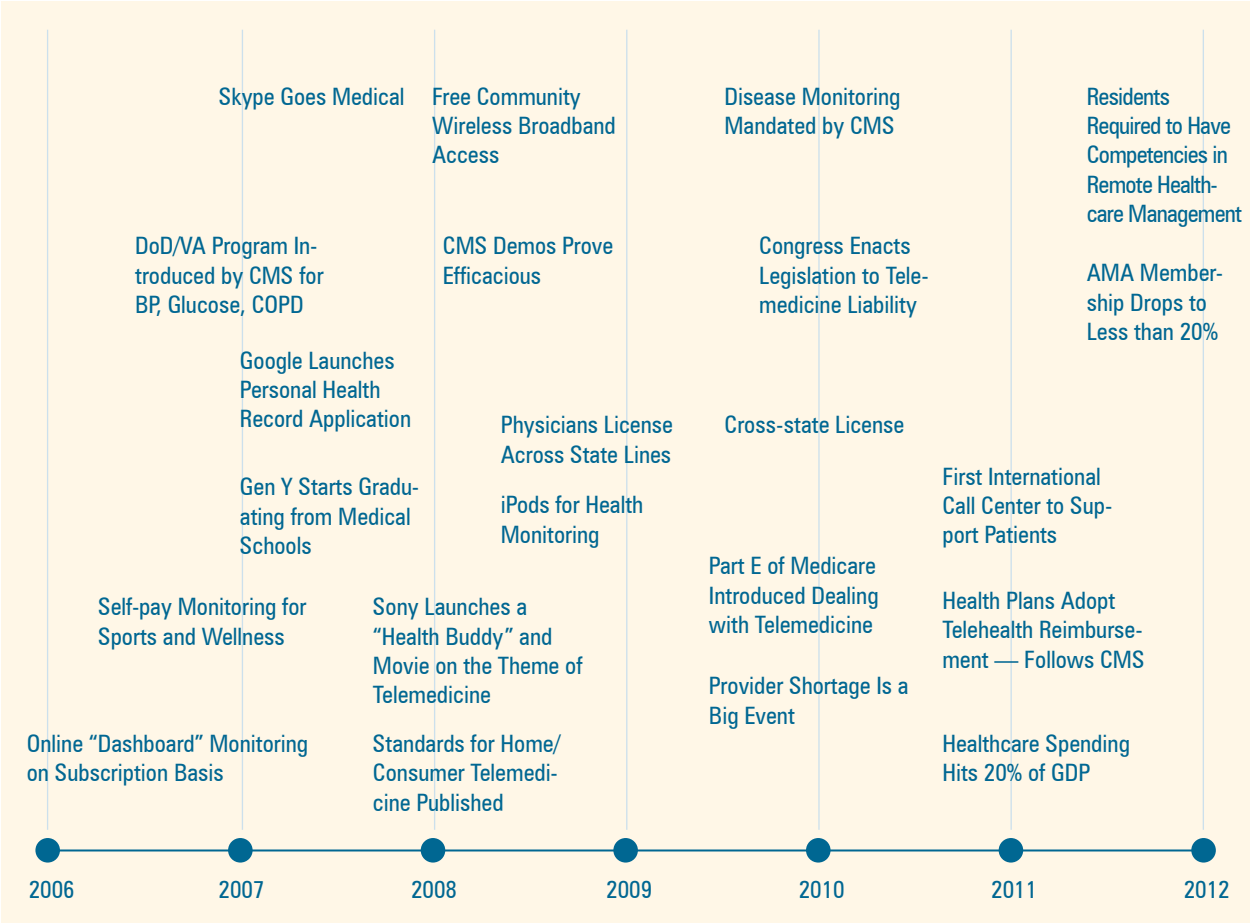
The MediPare scenario is based on the financial incentives driving the penetration of Telemedicine. Specifically, this is the future in which Centers for Medicare and Medicaid Services (CMS) provide reimbursement for healthcare outside the traditional healthcare locations and endorse the model of remote healthcare. Call this the "Part E" reimbursement model. In this scenario, we see Generation Y influencing the purchase of in-home care for elders suffering from chronic diseases and as a means of monitoring the elder's well being from a distance. As a result, quality of life is improved all for all, and the healthcare economics are stabilized for patients. Access to healthcare is improved, as well. With CMS leading the way, insurers follow; however, there is more risk sharing. States support cross-practice/license enabling rapid growth of Telemedicine.



Roadmap for Scenario C: MediPare

The following figure highlights the actions and activities that may take place as the scenario unfolds.

Telemedicine Roadmap Under Scenario C



Implications of Scenario C: MediPare

The possible implications of Scenario C in terms of opportunities and risks for various stakeholders are delineated.

Opportunities and Risks under Scenario C

Stakeholder	Opportunities	Risks
CMS	Understanding and management of total costs Overall cost stabilization Quality definition and metrics "Pay for performance"	Over utilization; short-term cost increase Risk of reputation Quality can be driven down Managing "Bad guys"
EMPLOYER	Patients assume more responsibility Costs may go down, specially for self insured Heavy adoption influenced by collaboration with health plan	Cost may go up, if not managed carefully Competitive disadvantage Over utilization; become a part of the risk equation If I provide the device am I liable? Can I force my employees to stay on the program?
CLAIMERS AND "PAYORS"	Quality of life (QOL) control Greater choice over physician – lower switching barriers More involvement and knowledge about health and healthcare Enthusiasm for ownership and involvement in care Saves time; more in control; more "family friendly"; fits my high-tech lifestyle	Risk of responsibility/privacy/quality Assuming more of the cost of care Transparency of bad behavior – non-compliance "Payors" are perceived to be rich and protected Dealing with haves – see it an a natural evolution; have nots – just another thing I don't get Social angst and political influence Enforcing eligibility and employability criteria 30% of claimers who say, "I like seeing my doctor – it gets me out" Separating low value vs. high value patients
PHYSICIANS	Better management of scarce resources – time, space Opportunity to private label devices and get percent of device revenues "The Bernard Home Heart Monitor" Better compliance, efficiency, and innovation Bigger potential market (eBay effect)	Loss of: control, income and autonomy Questions about quality – need to see protocol Liability risk; "Am I liable for care that I don't track or administer; what money do I lose?" Data overload; more work for less money More competition; more price pressure
NPCs	Increased job opportunity; income Autonomy Growth opportunity – new businesses centered on care Increased interest based on increased responsibility More and flexible employment (hours, location)	Risk of accountability/outsourcing Data overload; more work for less money Lack of clout Access to specialty support

Closing

People participating in the two-day Monitor Telemedicine Workshop had a range of opinions, but there was considerable consensus about the future of Telemedicine, its implications, and the barriers and enablers. Universally, participants agreed that wide spread usage of Telemedicine will become a reality in the near future; it is not a matter of if, but when.

The group consensus was that there were two important factors influencing the evolution of Telemedicine: (i) disruptive events from either demand or supply side, and (ii) the way reimbursement for Telemedicine evolves, both from the government payors (CMS) or private insurance companies. Any plan for exploiting the opportunities created by Telemedicine will need to include a process for keeping a close watch on these uncertainties and be able to react.

There are other uncertainties and barriers, of course. Several structural problems need to be addressed. For example, the issue with licensure of doctors practicing remotely, and the liability associated with a health provider in a far away country making mistakes need to be examined and solved. There are issues surrounding privacy and broadband availability. The sensor technology has to be improved to a level that it becomes reliable and fully credible. Remote monitoring can not work without this technology. However, none of these uncertainties and barriers are deemed to be "show stoppers."

Telemedicine promises to bring great opportunities to all the stakeholders involved. Patients are going to receive improved access to healthcare, increased choices, better control of their health, and perhaps, some financial savings. For medical device companies, Telemedicine provides new growth markets and increased revenue. It also allows them to examine possibilities beyond being a medical equipment company, as opportunities to enter other parts of the value chain emerge. Physicians will be able to cast a wider net and manage their resources (space and time) more efficiently. Hospitals will see better patient management, decreased workload in ER, increased revenue, and decreased costs (e.g., shorter length of stay).

However, each stakeholder faces some risks as well. For doctors, there is a potential reduction in number of local patients (because they out source their

treatment), and the patients may face reduced quality of care, if the remote healthcare providers are not properly monitored or certified. There is the balance between accurate remote diagnosis versus physical analysis, and which is required. Hospitals that are not involved in providing remote care may face a reduction in revenue to the benefit of those who do. There are going to be winners and losers. A careful evaluation of the coming Telemedicine wave is required, and actions need to be taken now to make sure that we end up on the winning side.

Overall, there is a feeling that we are close to a tipping point in the adoption of Telemedicine. The proximate cause for the tipping point could be the fact that Generation Y is starting to take over…not only as consumers, but also eventually as healthcare providers. An entry into the fray by a major corporation could also serve as a tipping point, whether it is one of the brand name supporters of healthcare (Intel, HP) making a more substantial commitment, or a new and powerful company (Google, Microsoft) joining the game. The aging Baby Boomers can make a big difference: Telemedicine provides a nice solution to remotely monitoring their aging parents or taking care of themselves in retirement. A major change in the reimbursement policy (CMS agrees to reimburse) can provide the push, as well as, a pandemic that stretches the already tight shortage of healthcare providers to its limits.

While we wait for the tipping point, we note that the role of Telemedicine is also expanding, so much so that the word itself may need to undergo a metamorphosis. Is it Tele- Health we are talking about, or Remote Health — one in which the wellness is as important a factor as sickness? As the technology allows it, and the society accepts it, the idea of on-going monitoring through embedded sensors is bound to take hold; there are those among us do not mind trading some loss of privacy for a more secured healthy future. Add some financial incentives for doing so, and you will have plenty of converts.

The inexorable march toward a wider acceptance of Telemedicine has already been initiated. It will happen, one participant said, with or without the healthcare "industry". The rules of the game are changing — stay tuned.

Many Thanks to all our participants who contributed to the ideas in this paper:

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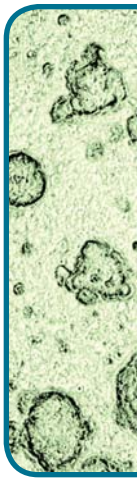

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