Roundtable Discussion

Up from Crisis: Overhauling Healthcare Information, Payment, and Delivery in Extraordinary Times

Dialogue with Featured Speakers from the 6th Annual Connected Health Symposium

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Introduction

The 6th Annual Connected Health Symposium, hosted by the Center for Connected Health, Partners HealthCare, is occurring in mid-October 2009. In preparation for this meeting, the Center's director, Joseph Kvedar, M.D., assembled a small group of individuals, each of whom will be featured speakers in Boston to discuss healthcare in these extraordinary times. As with all of the roundtables that we bring you, this one is particularly poignant as healthcare reform is front page news and it is a key element and perhaps the largest initiative of President Obama's first year in office. The assembled speakers are clear thought leaders from business and academia, and they have provided foresight in their discussion of the transformative change that must occur from supply chains: catalysts such as payment reform, new paradigms such as retail outlets, and a focus on wellness and prevention rather than on acute and reactive medicine. Disruptive innovations, which may not be revolutionary, are key change agents on both a micro and a macro scale. The outline of this roundtable was to perhaps lay a foundation for discussion both clinically and financially as reform is under way. It is clear that the assembled group is passionate about change and believes it must be done in a way that benefits the delivery of healthcare.

—Charles R. Doarn, M.B.A., Editor-in-Chief

JOSEPH C. KVEDAR: Our roundtable today is focused on the Connected Health Symposium entitled "Up from Crisis: Overhauling Healthcare Information, Payment, and Delivery in Extraordinary Times," which will be held on October 21 and 22 in Boston. We're very excited to have four Symposium speakers with us today who bring a great deal of knowledge and a diversity of viewpoints about the role of technology in healthcare delivery.

Many industries have been reshaped by technology and the Internet, among them the airline, financial services, and travel industries, where old paradigms for conducting business have been broken.

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Whole industry segments have been disintermediated. At this time, however, healthcare hasn't gotten there yet. I'd like us to use our experience and talk about some of our work, to peer into the crystal ball and suggest who the winners and losers may be when healthcare is transformed by technology, how that will happen, and what the catalyst for it might be.

LAURIE M. ORLOV: Although there is now an opportunity for transformative change in healthcare, it is enabled by all of the forces in today's marketplace. I don't necessarily believe that a change is guaranteed. Healthcare delivery is really not quite like other supply chains. In healthcare, a dollar in cost savings is a dollar of income lost in the supply chain. So one of my questions would therefore be to ask what motivates participants in a supply system to voluntarily cut their own incomes. And secondly, I would point out that some studies tell us that with electronic access to physicians, one in five visits to physicians could potentially be eliminated. In that context, I would note that one of the things automated by other supply chains was to tier the level of access so that the least costly access was the one utilized first. That is why, today, one is so often directed to the Internet before telephoning a human agent at a call center; and then a consumer always talks to a front-line call center agent before being redirected to an expert on the back end. That doesn't seem to be working in quite the same way in the healthcare industry, and I'm not sure the real question is whether new technologies, rather than changes in workflow, would motivate participants in the healthcare delivery chain to model themselves after those in other supply chains.

JOSEPH C. KVEDAR: That's fascinating. Tracey, can you comment on that?

TRACEY MOORHEAD: I'm strongly in agreement. There is enormous opportunity for using electronic technologies in healthcare delivery, and for creating better incentives for streamlining the delivery of care. I agree that many technologies do have the potential to be disruptive to the existing system, but until we better align the goals of an economical and effective healthcare delivery system, and eliminate the fragmentation in the provision of care and reimbursement for it, we won't be able to capitalize on those opportunities.

JOSEPH C. KVEDAR: Jason, do you think that the noise coming out of Washington about payment reform is sufficient to be a catalyst for this kind of change?

JASON HWANG: I think it ties into the question of whether technologies themselves are sufficient to drive change in the healthcare industry. I think that in general, the approach that we've taken historically, and what is now happening in Washington, is the wrong approach—simply expecting that somehow, the leaders of the healthcare industry should become more efficient and better at what they're trying to do. And yet, as we've seen time and time again in other industries, including the financial services and airline industries, there is no way to force companies like Morgan Stanley or United Airlines to somehow become more cost effective. Their business models simply weren't suited to make money at a lower rate, as a firm like Charles Schwab could, for example, in the financial services industry. It was not in their interest to pursue that type of course, even though the technologies for doing so were available to them. In fact, given their resources, they probably had access to those technologies first, before Schwab ever did.

And likewise, in healthcare, cutting reimbursement rates, for example, is the general approach taken when it comes to trying to reduce the cost of care. And yet that approach is predicated on the ability of hospitals and physicians to somehow, themselves, become more efficient at what they've always done. That can work to a certain degree, but again, the disruptive approach, in which a lower-cost player can create a sustainable healthcare system that can still make money, is what is really needed. And so a new business model, which utilizes technologies in a disruptive fashion rather than expecting them to change the way in which existing stakeholders do business, would really seem to be the right approach.

PETER A. UBEL: I completely agree, and the Obama Administration is investing a lot of money in the electronic medical record in the hope that it will help control healthcare costs. But its success depends on how people use the electronic medical record. It might make doctors more efficient at billing for what they do and therefore increase costs. So the technology is only a part of the package; you have to look at how people will behave with that technology.

JOSEPH C. KVEDAR: Trying to summarize a bit the theme on which we all seem to agree, technology is an enabler. What is required is perhaps some sort of catalyst for a new business model in healthcare delivery. We still haven't heard what that might be, and I think it's still something of a mystery. I don't think that the ideas for payment reform coming out of Washington are enough to be transformative, although I do think they represent a step in the right direction.

Before we move away from this particular topic, I'd like to ask whether anyone would like to speculate on what might be the catalyst for a new business model in healthcare delivery. As one possible instance, retail clinics are said to be a disruptive innovation. Is that the kind of thing we're going to see, the straw that breaks the camel's back?

TRACEY MOORHEAD: I do believe that retail clinics have a role to play in a new paradigm of healthcare. I don't believe that they're the straw that will break the camel's back. But, particularly as we seek to focus our healthcare delivery system more on prevention and wellness, I do think that we should rely on retail clinics for the services

that they can help to provide to certain segments of the population that need those services.

LAURIE M. ORLOV: I'd like to also offer the pharmacy, in addition to the retail clinic, as an organization through which nearly everybody passes. And I wonder whether pharmacies, perhaps instead of the primary care physician, might become more of a hub of information-sharing in the healthcare delivery chain.

TRACEY MOORHEAD: I think Laurie is right. This discussion is moving toward what we were referring to earlier as a new business model that utilizes technology as an enabler for better connecting the various points at which the individual citizen—whether healthy, at risk for illness, ill, or chronically ill—can receive care, and how to ensure that that care is coordinated across all of those points. But as another speaker was saying, technology is not going to be of any assistance in helping to redesign the model if it isn't appropriately utilized by the various providers.

JOSEPH C. KVEDAR: I'd like to ask Peter a question about behavioral economics. A healthcare system clearly involves multiple stakeholders, and we have talked about some of them, whether they are health plans, payers, providers, patients, families, social networks, other caregivers, pharmaceutical manufacturers, or pharmacies. Is there a component of behavioral economics in which both quality of life and cost-effectiveness can be enhanced by behavioral adjustments shared by some or all participants in the healthcare value chain, and not only the patient? Does the answer really lie in moving the patient to healthy behavior, after which everything else will fall into place?

PETER A. UBEL: I think it's essential to address the issue of how behavioral economics affects healthcare reform, wherever these two factors end up meeting. But there is no way in which we can expect patients alone to bear the burden of reform or to make all of the changes necessary to reform the system. I think that there are two points in behavioral economics that will help us to understand the ways in which we can succeed or fail in reforming healthcare delivery. The first is whether we can get people thinking about gains or losses. And the second is whether we can get them to think about their present situation or their future. Right now we have hope for healthcare reform because people are afraid that at some time in the future they may lose their healthcare coverage, and because many people have already lost their healthcare coverage.

The problem we face is that if it's going to succeed, healthcare reform is going to cause a great amount of change from what we now have. If we're going to control healthcare costs, we have to make major changes in the system, and in most people that triggers a sense of loss, and of worry that they're going to lose access to their physician or to the kinds of medications or other treatments or tests that they're used to receiving. That is a very strong emotional force and will make people oppose reforms.

LAURIE M. ORLOV: One of the things that we haven't talked about is the extent to which, as deductibles increase and more consumers possibly lose their healthcare insurance, they go outside the system altogether and focus on self-care, with devices they might buy to check their own vital measures at home. Or they may focus on alternative medicine, which is a private pay-for-care industry. So from a consumer standpoint, it has to do with how healthcare services can benefit the individual consumer. And from the provider standpoint, the question is: "How can I remain cost-effective in delivering care?" The degree to which these two things intersect is what will yield a behavioral economic model for change in healthcare delivery.

JOSEPH C. KVEDAR: I would argue that none of the groups that I mentioned—whether the patient, family, friend, provider, or payer—has quite the right incentives at present. So there are incentive opportunities all the way along. Just to begin with, half of our healthcare costs can be attributed to unhealthy behaviors, and so there are certainly things we can do as individuals, consumers, and patients to improve our own health. Physicians and other care providers have the incentive to get through the day with as little disruption as possible, even if it may mean doing more costly things. So there is plenty of room for incentives and penalties.

To move to another theme, I wanted to ask Tracey, on the basis of her experience at DMAA: The Care Continuum Alliance where she encounters a kaleidoscope of viewpoints about healthcare delivery, whether she might point to one or two things that need to be done now to ease the current crisis and move toward an America in which patients are empowered to better manage their own care, providers have the right tools for permitting this, and elders have the ability to remain independent in their own homes for as long as possible.

TRACEY MOORHEAD: I think there are a couple of things that can be done in that direction. One of the most important is to ensure that everyone has access to coverage. I don't think there is any single answer for how to provide that access, because of the multitude of current reasons for why someone could lack coverage. But I do think that providing coverage for all people needs to be a primary goal of healthcare reform.

Secondly, I think that we need to shift the healthcare system generally from one that is focused on acute and reactive care, which was the basis on which our healthcare system evolved, to one that gives much greater priority to and focuses much more on wellness and prevention. That shift needs to permeate every aspect of our society, from changing the way in which school lunches are delivered and children are educated about healthy activities and healthy behaviors, to the training

of physicians in medical school about the importance of encouraging healthy behaviors in patient populations. It should even be inherent in the management of physicians' clinical practices so that they focus more on treating acute illnesses and delegate more responsibility for management of healthy persons or patients at risk for illness to other providers, such as nurse practitioners or diabetes educators.

I think that accomplishing such a shift from acute and reactive to preventive and wellness-focused care would allow us to free up resources that would provide greater access by the chronically ill and other patient populations to the types of services that they require. Those are two of the overarching themes that we're seeing emerge through the healthcare debate. And underlying each of these goals is the need for the various components required to achieve them, such as health information technologies.

JASON HWANG: Something I would like to address is the theme of decentralizing healthcare. The bottom line is moving the tools and the information required for the delivery of care closer to the patient, and even putting them directly in the hands of the patient. Coming up with the means to that end result is really one of the core messages of our work.

When you use disruptive technology appropriately, you're enabling the new business models, like the ones we discussed earlier, in a way that permits new venues of care to develop and new people to become care providers. You're no longer centralizing care in the hospital, and ultimately and ideally, the patient can take over his or her own care.

PETER A. UBEL: The most familiar example of patients taking charge of their own care is that of diabetes care and what the glucometer has done in that area. Often when I'm talking with physician audiences about disruption, I sense great fear about sacrificing the patient's safety and a feeling that we're doing them a disservice when we move care out of the professional's hands. Yet when one goes back through the history of medicine, one can start to see that time and time again, and often unintentionally, we've shifted some responsibility for care to patients. That is, provided that the care has reached a high level of precision and delivery of the care has become rules-based so that it can be guided by a simple algorithm and you no longer need medical expertise to deliver it.

Diabetes care, at least for simple sugar management, has reached that point, with a set of rules that patients can follow at home to administer their own insulin shots.

JOSEPH C. KVEDAR: Another example of this is our hypertension self-management program at the Center for Connected Health, where we did a randomized controlled trial with employees at the data storage company EMC, Inc. In this study, we used a blood-pressure cuff device to move patients' information collected at home onto the Internet. We then displayed back to the patients their readings, the context of the readings, and an automated coaching algorithm to send them action-oriented messaging designed to change their behavior, when needed. In 6 months of testing the interactive system, we found a high degree of adherence, with less than a 1% dropout rate. At the end of the 6-month period, the participants were still logging on once a week, as we asked them to do, and were uploading their blood pressures readings three times a week, as we had also requested. And their blood pressures were significantly lower than that of the control group. So that's an example. We're now extending that in another trial that offers patients algorithms for changing their own medications on the basis of their blood pressure management.

JASON HWANG: I'd like to connect that program to our earlier discussion illustrating that an acute illness model that is poorly suited to serve as the basis for dealing with chronic diseases and behavior management. I think that decentralizing care and shifting it to the home is clearly the path to reaching the goal of changing the existing healthcare system. We do our patients a disservice when we tell them that the best way to manage their diabetes is to see their physicians for 15 minutes at a time every two or three months, when they have to deal with their disease 24 hours a day. Decentralizing care and putting more information and control of disease management in the hands of the patient is really the only way to effectively reduce what amounts to 75% of our national healthcare cost.

JOSEPH C. KVEDAR: The term "continuous care" as opposed to "episodic care" has been used to describe that model. It's a very powerful model. I do think that the way in which to finance it is still a challenge. Some of the things that we've found encouraging—such as the warning that Medicare will no longer pay for 30-day readmissions—are very much a harbinger for a new payment model. And so is a bundled-payment type of scenario. We've also heard talk of shared-savings scenarios, which are also interesting. We have to see what unfolds, and just how many teeth the government will put into payment reform to determine whether any of this can really be meaningful.

The other point I'd like to make is that, in our experience, if you give healthcare providers the problem of setting up the medical home, or asking them to solve the issue of more continuous care, providers come up with a scenario in which they hire more staff. Their solution isn't to do things very differently from the way in which they're now doing them. It's incumbent upon those of us who have experience with different models of care, and know that they're successful, to become evangelists for these models.

LAURIE M. ORLOV: I would add that there seems to exist almost an inversely proportional relationship here between the degree of decen-

tralization of care and the degree of centralization and potential for dissemination of information. Thus, for example, the more you have standardized and centralized information about a specific patient that can be shared among multiple healthcare providers, the more you can effectively decentralize care. Otherwise you're really throwing the care out into the arena without necessarily managing it.

PETER A. UBEL: I'm a primary care physician and like much of what I'm hearing. I try very hard to have a partnership with my patients, who to a great extent have to manage their own chronic illnesses. But I don't think we can expect a great deal of cost savings, even if the model that we've just been discussing were to get enacted and succeed. I don't think that 75% of care costs are consumed by chronic disease care.

I don't know how much of current care costs they would save, if any. I'm not sure that really tight blood sugar control saves money. And so I think that while we want to encourage patients to get involved in their own care, and that knowledge is a very important part of their doing that, we have to look elsewhere if we're really seeking to save a lot of the cost of medical care.

JASON HWANG: As a primary care physician myself, I also think that we need to distinguish between cost cutting and more cost-effective care. Many studies have shown that prevention and behavioral interventions aren't necessarily cost-saving, but that they are cost-effective. And the emphasis on that point of their being an investment is one of the positive aspects of the Obama Administration's current platform. I don't expect that having nurses teach patients with diabetes how to eat and how to self-inject and how to tightly manage their glucose is going to reduce costs in the long run, but it is nevertheless cost-effective care, because it will ideally prevent greater downstream costs. So my goal is again not necessarily to trim costs such that they no longer climb exponentially, but rather to get in return the value increase for our investment.

JOSEPH C. KVEDAR: This is an important nexus in the debate about what is and isn't cost-effective and cost-saving. Is anyone convinced that these new care models that we're discussing, facilitated by technology and patient-centric care outside the traditional care settings, will result in cost savings? I'll give anyone the chance to state that case before we talk about nuances of cost-effectiveness and so forth.

TRACEY MOORHEAD: I think it depends on the technology and resources required, and the patient population that is involved. The President essentially said, in a recent speech in Wisconsin, that better management of a diabetic patient's condition can save $3,000 by avoiding an amputation as opposed to costing $500 for a nurse-coach. I agree that you can save money by avoiding exacerbations or acute complications, and that adding more people and paying for coverage for more people and helping more chronically ill or at-risk patients to better manage their condition may very well result in greater expenditures across the board. However, it will yield better outcomes in terms of health. And that gets to the question of value propositioning and what we're going to value most greatly. Are we going to value improved health status and quality of life, which I think is the shared goal of everyone looking toward healthcare reform? If so, I don't think that we can expect to see dramatic cost savings, but I do think that we can expect better cost efficiencies and better-coordinated care for individuals.

JASON HWANG: I'd like to provide a classic out-of-industry example of cost versus value, because it's one that people tend to grasp well. It has to do with the disruption in the computing industry brought on by the advent of personal computers in the era of more traditional mainframe and minicomputers. When the computing world was in the era of minicomputers, few people had access to computing power. One had to visit a corporate mainframe center to gain such access. And when the personal computer disrupted that, and a lot more people could afford and use computing technology, the world began to spend far more money on computing than it ever had in the era of the mainframe or minicomputer. Today, everyone is better off because of that.

So again, looking at value as opposed to simply looking at costs or expenditures seems to me to be the right approach. If the disruption brought to the computing industry by the personal computer had not happened, we would have been stuck in the era of mainframe computers and been telling ourselves that the way to control costs in mainframe computing was to not buy so many mainframe computers. But instead, we came up with a disruptive technology that was much more affordable and inclusive in being decentralized and giving many more people access to computing power and data sharing.

LAURIE M. ORLOV: In terms of the mainframe and the PC, I know that today we're all addicted to computers and the Internet, but there have been studies showing that not one ounce of white-collar productivity has been gained from all that innovation.

JOSEPH C. KVEDAR: I'd like to carry this thread a bit further. The United States already spends as much as 20% more per capita on healthcare than the next highest spending westernized country. We're off the charts as compared to our neighbors. I hear some people say they don't know whether this or that measure will cut costs, but it will add value and quality. Are we then saying that we could greatly increase quality, perhaps at the same costs we currently have? If so, we ought to remember that we already spend far more than the next closest country on the economic chart. How are we going to deal with that? I do think that the approaches we're offering will cut unneces-

sary costs, but as Peter was saying, there will probably be other costs that spring up with these approaches that we haven't thought of. However, I also believe that the strategies we're talking about will probably also provide additional value.

I'd like to hear your views on this conundrum. If we already spend far too much on healthcare, and can't commit to cutting costs, are these approaches really going to raise the value of the returns by so much?

LAURIE M. ORLOV: An executive in a firm called Consult-a-Doctor, which provides telephone-based physician visits, gave me a relative cost ratio in which an in-person visit to a physician insured by Blue Cross can cost $150, an emergency room visit can cost $1,200, a prescriptive diagnostic visit by telephone costs $30, and an e-mail-based visit would be free. In view of that, I don't understand why interactive methods of providing medical care wouldn't reduce costs.

PETER A. UBEL: Randomized trials of primary care have shown that increasing access to primary care increases the cost of care because it means that physicians start ordering more tests and other diagnostic procedures and make new findings that must then be addressed. The question here is again whether this improves value. We can still ask whether this constitutes making good use of tests and other procedures, but that doesn't necessarily translate into lower costs.

JOSEPH C. KVEDAR: I think we may be talking about different things. It could be true that traditional access to office-based primary care may not be the right way out of the conundrum of cost versus scope of care, but I liked the thinking in Laurie's comment about nontraditional methods of access, such as e-mail or telephone, and I'd appreciate it if she could expand a bit on that.

LAURIE M. ORLOV: One of the concepts is that of the mini-clinic or walk-in clinic, for which the cost of a visit is half that of a primary care visit. It seems to me that the idea of using technology to triage someone to the lowest cost form of care that is appropriate, using relevant information and algorithmic or other intelligence, is more the goal for cutting costs than increasing access to primary care physicians in the traditional system.

Also very interesting is the AARP Healthy at Home 2008 study, which dealt with the use of technology in the home in caring for senior citizens and their views and the views of caregivers.

One of the points of that study was that 96% of the senior citizens surveyed wanted to help their physician to monitor their health through the use of technology, if that was at all possible. Most were willing to pay for the necessary technology, as long as the price was under $50 a month. I realize surveys asking people about their willingness to do such a thing is not the same as surveying people who have actually used such technologies. I realize these are two different things. One of the key points in the Veterans Administration's 2008 study looking at the efficacy of using multiple telehealth technologies such as videophones, digital cameras, telemonitoring, and monitoring of vital signs—and a point that I think we still haven't seen outside of the VA's vertically integrated healthcare system—was that coordination of care integrated well both with information technologies and with patient self-management.

JOSEPH C. KVEDAR: That's a useful observation in terms of coordinating care and information technology for patient self-management.

LAURIE M. ORLOV: The perspective is really that of a workflow process.

TRACEY MOORHEAD: Speaking on behalf of DMAA, I'd like to thank Laurie for basically reiterating our primary strategic goals.

JOSEPH C. KVEDAR: Well, even though we may not have solved the cost problem, our discussion so far has at least given us some potential insights into it. As we move ahead, though, we still have the burden of thinking about whether the interactions we've discussed as nontraditional visits, an e-mail visit, or a trip to a mini-clinic carry a cost, even if the cost is to a different sector of the system, just as using a telemonitoring program to reduce readmission for heart failure adds cost. It's not net cost positive, but it's not neutral cost, either. It adds costs in the arena of more nurses needed to do the telemonitoring, costs for follow-up, and other costs. Those are the kinds of things about which we have to be thoughtful when stating numbers.

I want to ask Jason to speak further about disruptive technology in healthcare. The book he co-authored with Clayton Christensen, *The Innovator's Prescription: A Disruptive Solution for Health Care*, published by McGraw-Hill, as well as other books that he has written, have really made disruptive technology something of a living-room term. Can a technology be disruptive to healthcare? I thought that what Laurie said about a dollar saved being a dollar of income lost was salient. How are we going to overcome that with a disruptive technology?

JASON HWANG: I think it's important to first resolve some of the misinterpretations and misunderstandings about what disruptive innovation means. It's a mistake to think that disruption is equivalent to revolutionary. Often what we've called disruptive systems or technologies are simple business models or simple technologies that dramatically change the way in which healthcare is delivered. I think it's also a mistake to believe that disruption necessarily leads to inferior quality or safety. Part of that is our own doing, because when we use examples from outside the realm of healthcare, we're often talking about a genuinely disruptive entrant. But in healthcare, we're

clearly not willing to sacrifice patients' health in order to somehow introduce a disruptive innovation.

For example, with the retail clinic model, which is quite illustrative of some of the basic principles involved in algorithmic or rules-based care, one is no longer dependent on the intuition and training of a physician. There is little room for error because the system is very process-oriented and outcomes are therefore predictable and safe, and in a growing number of instances, are in fact being guaranteed by the healthcare provider.

Frequently, then, when we talk about disruptive innovation and providers wave the red flag of safety and warn that we can't allow it to be compromised, they're really exhibiting the guild mentality that often arises when we're trying to change the established system of professional care.

I want to make it clear that our goal is not to put doctors and hospitals out of business, but to free them so that they can truly take care of the patients that deserve their attention. The problem with today's healthcare delivery system is that we pay providers to deal with problems that they don't necessarily need to be dealing with, and that their time could be better spent elsewhere, and we ought to pay them to spend that time elsewhere. Our belief is that every professional should be able to practice to the limit of their skill and licensure, and not be relegated to dealing with issues that don't fully utilize their expertise and training. So redefining workflows and bringing in the workforce that can deal with multiple levels of problems, rather than our continuing to pay for a centralized system of care—a one-size-fits-all system—is really an overarching goal of disruption in healthcare.

JOSEPH C. KVEDAR: Peter, how does it strike you, as a practicing primary care physician, that we should pay you only to do the things that you're really most needed for, and should pay others to do the other things? Do you think that's workable?

PETER A. UBEL: I don't know whether that's workable. I think that what is really driving today's healthcare costs are how much we charge for what we do and how much we do. Those questions are as important as any of the other things that we've talked about today. I think that changing how payment is made and what is being paid for are the keys to controlling healthcare costs.

JOSEPH C. KVEDAR: We've talked a lot about disrupting traditional healthcare and moving the cost needle in healthcare. I'm going to shift gears a bit and talk about the consumer. Our experience at the Center for Connected Health has been that, for matters of health and wellness, we see a market for the device-based data uploads and other kinds of tools that we promulgate. Currently, though, as soon as someone gets a diagnosis of illness, we hear the hue and cry that "I want my health plan to pick it up; why would I want to pay for that?" How will we get these technologies embedded in the home and get consumers to pick up part of the costs for them? Earlier on, Laurie mentioned alternative medicine as an essentially cash-and-carry market in healthcare. I'm going to ask Laurie to comment on whether it might not be conceivable and feasible for individuals to buy the necessary devices and monitor their own health.

LAURIE M. ORLOV: I think it's interesting that consumers are willing to pay out of pocket for alternative therapy. That could be acupuncture, it could be home health remedies, and many other things. So I wonder whether the problem with the consumer recalcitrance that you mentioned isn't in the presentation of the cost, in the context of the current insurance and healthcare system, rather than in the cost of the technology itself. I recently heard about a study in which Philips Telehealth Solutions engaged patients in 60 days of home telehealth monitoring. The study participants were very happy to have the home telehealth monitoring devices in their homes and, in fact, felt that someone was actually paying attention to and caring about them by telephoning them and saying, "Your blood pressure seems to have changed. Did you just have something different for dinner?"

At the end of the 60-day period, a number of the patients expressed willingness to keep their monitoring devices and monitor their own condition. They wanted to keep the data for themselves and not necessarily share it with their physicians, apparently for fear of being labeled as continuing to have a disease.

And I would also return to that point in the AARP study about 96% of the patients wanting to help the physician monitor and manage their own health, as long as the price for the necessary technology was below $50 a month. I think that if you put these points together, you see that the issue is really more in the presentation of the cost and its context.

JOSEPH C. KVEDAR: It almost sounds as if you were describing our program of telemonitoring for heart failure at Partners HealthCare. We have quite a few instances in which elderly patients, who constitute most of the population with heart failure, ask us to please leave the monitoring technology in their homes because they feel it's a lifeline. They like the fact that a nurse is phoning them and reminding them to take their vital signs and watch their diets, that someone is looking after them. So we agree about that.

The catch is knowing that, in our system, the cost of the technology and the cost of the program itself is $200 or $300 a month. None of our patients have yet reached into their pockets to fund that sum. When they hear that price tag, they just can't do it. Regrettably, that would seem to address the issue of the $50 cutoff that you mentioned. And we haven't found a way to get heart failure tele-

monitoring down to anywhere near $50 per month, although some of our other programs are less costly than that, and maybe they offer an opportunity for patient-based support.

TRACEY MOORHEAD: I think there are two points here. One goes back to the issue of aligning incentives and helping patients to understand the benefits that they can get through better care coordination and utilization of various technologies. Over the longer term, I think there is a real opportunity among people who want to age in their homes, and whose family members or other caregivers don't live nearby. Many patients are beginning to express interest in monitoring technologies, whether visual technologies or other remote monitoring technologies, that can allow their relatives or other caregivers to keep better tabs on their health status, such as how often they take their medications and whether they're eating well.

I'm hearing ever more frequently from DMAA members that there is growing awareness of the benefits of this, not only to patients and their caregivers, but also to healthcare professionals. I think that helping to implement the necessary technologies for these populations will help to educate an expanded population about the benefits of these technologies, and will make the costs involved in them more readily acceptable.

LAURIE M. ORLOV: We're probably all familiar with personal emergency response systems, such as Philips' Lifeline system. I seem to remember that even though devices like that are marketed directly to elderly consumers, their cost is split fairly evenly between those consumers and their adult children. So that represents an example of a situation in which adult children recognize the value of these devices, and I think that can translate into the acceptance of such technologies by multiple segments of elderly people and their adult children.

Right now, something on the order of 50% of all Baby Boomers have at least one living parent, and right now, we're in a time when large numbers of people are unable to sell their homes and move into assisted-living or independent-living communities. I think that makes the present an optimum time for discussing cost sharing in the use of new healthcare technologies.

JASON HWANG: That again fits in with the concept of decentralization and shifting care outside of the centralized system, which to my mind is a much more cost-effective way of delivering care and improving access to it.

LAURIE M. ORLOV: The only thing I would add is that the cost of a personal computer in the home has been dropping almost on a regular basis, and that includes the cost of touchscreen personal computers, software that makes them easy to use, and a video camera to go on top of a personal computer. All of that can now be had for less than $500. That starts to make the personal computer look really appealing as a platform for information exchange between patients, their adult children, their caregivers, and healthcare cost payers.

JOSEPH C. KVEDAR: When I started my journey in telehealth in 1994, I was involved in imaging and dermatology, and the camera that we used had less resolution than the camera in a modern cell phone, but cost $12,000. That is an example of progress in technology and cost reduction. As we look into the future, I think that what we're talking about will go in that direction.

We've had a very rich dialogue and I thank each of our speakers today for sharing their perspective and insight. We will continue to share ideas, learn from each other, and discuss the future of healthcare delivery at our upcoming Connected Health Symposium.