(Music)

Mark Masselli: This is Conversations on Health Care. I am Mark Masselli.

Margaret Flinter: And I am Margaret Flinter.

Mark Masselli: Well, Margaret, this week brings us an annual day of remembrance and celebration of the life of Martin Luther King and as always, it's a great time to reflect on all he meant to this country.

Margaret Flinter: Yeah Mark, we always take this day really seriously. And I think we are not sure his message about access to health care as a social justice and a civil rights issue is as widely known as his other works so I think this might be a great moment to quote him. Of all the forms of inequality, injustice in health care is the most shocking and inhumane. Now that was a call to action almost 50 years ago and it holds still true today.

Mark Masselli: I think it does and we often heard during the months leading up to the passage of the Affordable Care Act about the persistence of health disparities and barriers to health care as obstacles that remain to be overcome.

Margaret Flinter: While we were remembering the past and Martin Luther King, we also had a great chance this week to look forward and hear what First Lady Michelle Obama and Dr. Jill Biden are focused on. They brought together a focus on health issues with a focus on supporting families in America.

Mark Masselli: That they did. And they reminded us of the powerful impact on health that our veterans returning from the warfront who are suffering from traumatic brain injury and post-traumatic stress disorder face.

Margaret Flinter: The First Lady and Dr. Biden announced their Joining Forces Initiative and that's a sweeping plan that in conjunction with 130 medical schools and research facilities across the country will work to leverage their missions in education and research and clinical care to train the nation's health care professionals to try new ways of meeting the unique health care needs of the military and the veteran communities then of course their families.

Mark Masselli: This is really important because so many of our returning vets, a full 1/6th of the nation's veterans coming back from Iraq and Afghanistan report issues related to TBI and PTSD and there simply haven't been enough resources to help the tens of thousands of veterans and of course their families who are suffering from these disorders.

Margaret Flinter: And the First Lady really took a long term view on this. I think they understood that unless they are better preparing the health care

professionals of tomorrow to recognize the signs of PTSD, conduct clinical trials, work closely with the VA, we are going to have a problem not just now but quite a ways into the future so, good for them.

Mark Masselli: Yeah, it absolutely is great news for our servicemen and women, and it will likely lead some beneficial results for the public health in general as well.

Margaret Flinter: And a recent issue of Health Affairs **reported** on the likely and pretty dramatic impact on soda consumption that a soda tax would have, just a penny-per-ounce tax would generate billions of dollars in revenue but have a direct health impact too.

Mark Masselli: You know that's right. They determined the tax would reduce soda consumption by 15% thus reducing obesity levels, preventing an estimated 95,000 heart events and 26,000 premature deaths over the course of the year. I think Dr. Tom Frieden, when he was in New York as the Commissioner of Health before he went to the CDC proposed this. It's a long struggle but an important one and I think we have seen the effects in other areas as well.

Margaret Flinter: We certainly have. We saw it in the reduction in cigarette smoking as taxes have driven the prices up and up. So it sounds to me like a sound piece of public health and a good thing to follow up.

Mark Masselli: On another front altogether we are excited to turn our focus to the new frontier in medicine that like everything else we talk about on the show has big implications for policy innovation and for health. The science of genomics offers promises of revolutionizing the way patients receive treatment and care in the future, especially since the technology is making personal gene mapping more accessible to the average patient. And Dr. Eric Topol is already leading the charge in that area.

Margaret Flinter: He is a leader on a few fronts. Dr. Topol is Director of the Scripps Translational Science Institute, he is an expert on genomics as you said, also an ardent supporter of transforming medicine and health care through the use of wireless technologies. He is now the author of The Creative Destruction of Medicine which tells the need for a complete overhaul of the health care system based on genomics research and technology. We are delighted to have Dr. Topol here today. But no matter what the story, you can find all of our shows and hear more about us by Googling CHC Radio.

Mark Masselli: And as always, if you have feedback, email us at www.chcradio.com, we would love to hear from you. Coming up our conversation with Dr. Topol but, first here is our producer Marianne O'Hare with this week's Headline News.

(Music)

Marianne O'Hare: Doctors in India are sending a worldwide notice about a new strain of tuberculosis affecting a handful of patients but whose numbers are expected to grow. A dozen of patients have been diagnosed with totally drug-resistant tuberculosis, meaning the first and second line of drugs ordinarily used have not been effective, leaving them without any treatment options other than isolation. Experts feel it's a result of poor early diagnosis and treatment with wrong antibiotics that made the patients susceptible to the drug-resistant strain. Officials are especially worried because one of the quarantined patients has gone missing. They feel these dozen cases may only be the tip of the iceberg.

Another medical story out of India, this one a positive. There were no cases of polio in the country of more than a billion people last year. Indian officials have successfully launched a nationwide vaccination campaign due to as many as a 100,000 cases over a year ago. A study out in this country shows chances are good, you are less likely to get costly screens and tests in emergency room if you are uninsured. Studies show those patients received fewer complex diagnostic tests then their insured counterparts. Patients entering emergency rooms with just Medicaid faired only slightly better in the study.

Veterans and PTSD, a nationwide program was announced by First Lady Michelle Obama to coordinate medical training centers across the country to better diagnose and treat Post-Traumatic Stress Disorder in returning vets. Veterans suffering from PTSD tend to have recurring nightmares in which the REM sleep is disturbed by the intensity of adrenaline. A University of California, Berkeley researcher has found a drug once prescribed for blood pressure, Prazosin seems to calm the adrenaline in these patients easing revisiting of their traumatic event. I am Marianne O'Hare with this Headline News.

(Music)

Mark Masselli: Today, Margaret and I are speaking with Dr. Eric Topol, a leading proponent in the use of genomics and wireless technologies to revolutionize medicine and improve health outcomes. He is the Director of the Scripps Translational Science Institute, and Vice Chair of the West Wireless Health Institute whose mission is to find effective ways to reduce health care cost. Dr. Topol, it's a pleasure to have you on the show today. It seems we are on the frontier of a new era in medicine and you were a keynote speaker at the recent mHealth Summit and are considered a visionary and thought leader in applying emerging technologies like mobile and genomics to the practice of medicine. But what's your vision for how these technologies can revolutionize health care?

Dr. Eric Topol: Yes. Well this is what I would consider an extraordinary time, the most exciting time ever in medicine. I have been a student of its progress for almost three decades but I would qualify this as a veritable (07:00 inaudible), the

supreme opportune moment just because we have this amazing digital infrastructure and superimposed and the ability to intersect that with the medical applications of that.

Margaret Flinter: Dr. Topol, in your book, The Creative Destruction of Medicine, you talk about the explosion of technology and entering the era of the digitized patient and I was struck by the persistent theme of individualized medicine based on individual genomics that you see as one of the hugely promising areas. But I think it comes right when much of the health care community has just gotten comfortable with the concept of population medicine, planning and delivering health services based on understanding the data and the risks and the outcomes of groups of people or population. So these are two pretty different approaches. How do you think health care not just medicine but public health and policy is going to reconcile and embrace these two very different approaches?

Dr. Eric Topol: Well, you definitely zoomed in on the overriding overarching theme of the book which is we have this newfound potential to understand each individual in a high definition granularity way we have never had before. That's the real extraordinary opportunity. That's the big difference today. We couldn't sequence a human genome before in a matter of hours and in an affordable way and be able to interpret it. We couldn't track any physiologic metric whether it's blood pressure, glucose, any vital sign, brain wave, anything you could think of continuously, remotely and image things of any part of the body with the hand-held high-resolution scanning equipment. So these things in addition to health information systems give us the ability to understand each person. We are used to digitizing books and periodicals and even movies but to do that for people, for persons, is a newfound very unique time in our life. And that's what really is the rebooting this creative destruction idea is that this goes beyond an innovative disruptive force. This is something we have never been able to do before.

Mark Masselli: I am fascinated by the concept of creative destruction. I am not sure it's a new term, it sounds like a Buddhist term. And you say it's necessary starting point for the transformation that accompanies radical innovation and you make the point that our world of social networking and connectivity has been dramatically altered by digital devices but in health care not so much, right?

Dr. Eric Topol: It's really sobering regarding how difficult it is to change things in the medical community. One of the greatest examples is the stethoscope, the icon of medicine introduced in 1816. It took 20 years for that to be used by doctors on a wide scale basis. And the same, now 200 years later, it takes 17 years is the average for new things to get incorporated into daily practice. So here we have this unparalleled opportunity, this newfound power to understand each individual to change medicine. And the reason that I put the book together was in fact because my sense that we could do this within the medical community appears to be virtually impossible. We need the pressure to be exerted from consumer activism I think particularly in a world where there is just

this phenomenal capability of social networking to bring people together to force change that's appropriate.

Margaret Flinter: So, Dr. Topol, as you have clearly laid out the mapping of the human genome, the digitizing of the patients can radically alter the way we treat patients going forward but as you know based on your own clinical background how we treat patients is half the battle and how patients engage with their own care and make changes is the other half of the battle that remains one of the areas to solve. What's the interaction of patients with this whole area of genomic medicine in your experience?

Dr. Eric Topol: Yes it's a great point to be a participatory whereby individuals say I need to know a specific part about my genomic data and the first place where that really comes up is in taking medication. so what we have now is a capability for many of the most commonly prescribed drugs to find out before the drug is ever taken, the first pill, whether it might induce a very serious side effect or whether it actually will work in that individual, will that be efficacious. So this is an opportunity for people before they start a prescription to say to their doctor what about genotype with respect to my DNA and how it will interact with that medicine, avoiding a lot of waste and perhaps even more importantly avoiding what can be very serious, even fatal, side effects. Let me give you one example of that. In the country Taiwan, you can't get a prescription for Tegretol now which is a very commonly used drug for many different neurologic conditions, but you can't get that drug prescription unless you get a genotype because of a potentially fatal side effect which is called Stevens–Johnson Syndrome whereas in United States no one gets genotypically screened.

Mark Masselli: We are speaking today with Dr. Eric Topol, world-renowned cardiologist and thought leader in the area of genomics, translational medicine, and wireless medicine. You just mentioned the area of safety and certainly that's one area we like to focus in but we also like to address making health care more affordable something you are committed to at the West Wireless Health Institute. As health care costs continue to rise, how much will these technologies cost to implement and how will they impact efficiency and cost?

Dr. Eric Topol: That's a vital issue, whether we can ever break this link that seems to be inextricable whereby you have new technology hi-tech and then you have high costs and how can we turn this around where we have this technologic revolution whereas for the first time that it can lower cost. We have evidence of that today. At the mHealth Summit I demonstrated actually on myself a couple of technologies, one that does your cardiogram on the phone basically for free.

Margaret Flinter: We are excited about that one.

Mark Masselli: Yes, we are.

Dr. Eric Topol: I do that for all my patients as a cardiologist. I don't order cardiograms now, I just take my phone out and do the cardiogram on the phone and send that quickly to be deposited for the record. And the same thing with an echocardiogram; I don't even listen to the heart anymore because the portable echo, the Vscan that I use, I don't need to send patients except under unusual circumstances to get a full expensive echocardiogram. This is just part of the physical exam, it's free and so in terms of the cost to the patient and the cost to our overall health care burden. So these are things that I use today that I think already demonstrate that new technology markedly lower cost. I mean there are over 20 million echocardiograms done each year so at least several billion dollars can be saved just for that one use of ultrasound technology. So the opportunities here for cutting costs are really I consider remarkable.

Margaret Flinter: Dr. Topol, as you may know, we devote a lot of attention with our guests thinking about health reform as it's unfolding in the United States and certainly to looking at the Affordable Care Act. And many say that the act is so deep and bulky, everything is in there but the proverbial kitchen sink metaphorically speaking. But it doesn't seem to me that beyond electronic health records and the exchange of health care information through exchanges which are vitally important developments but beyond that I don't recall so much attention devoted to some of these areas that you see as absolutely vital to quality and cost in the future, genomics, the digitized patients. What's your take on the Affordable Care Act relative to these areas? Were there things that you felt really should have been in there that were left out or not given sufficient attention?

Dr. Eric Topol: Well virtually everything we have been talking about was omitted from the Affordable Care Act. There was of course some attention to health information systems and Information Technology, the electronic medical records but as far as genomics, as far as wireless sensors, advanced resolution pocket miniature imaging devices those sorts of things, these technologies were not incorporated. The concept of digitizing human beings wasn't even mentioned in that 2000 plus page bill.

Mark Masselli: But isn't it fair to say that in the Stimulus Bill there was the Hi-Tech Act which provided the sort of the foundational dollars for people to go to electronic health records. so in some ways we talked about this a little earlier that there are all poor habits in terms of medicine around technology. But I think somebody must have been realizing this isn't, while on one hand there are revolutionaries like you in terms of technology and genomics, on the other hand there are luddites who really simply don't have the basics of any EHR to receive the wireless transmission.

Dr. Eric Topol: You know that's right. There was as I mentioned, the one thing on the digital medicine front that was incorporated was as you say hi-tech which is about electronic medical records which is going to be a slow process and already

plan $40 billion to be spent on that and it's not clear how much that's going to improve. But I think the other part that offers tremendous opportunities just going back to genomics for a moment in cancer therapy. We have already learned in a few types of cancer how knowing the driver mutation can lead to the appropriate therapy and cure the likes of which we haven't seen ever before. So the question is why don't we have a national program for all patients with a new diagnosis of cancer and get sequencing of their tumor, get sequencing of their native DNA, germ-line DNA, find the driver mutations and basically make a whole different look of how cancer is treated. If this was done in a Wiki-collaborative way, we would be well far along and it wouldn't take nearly the types of funds that have to be put in for that electronic medical records to accomplish that task.

Mark Masselli: You know let me just sort of jump in one more time on this because it sounds like on one hand you are a Wiki, Google-like flat revolutionary and on the other hand you are sort of talking about what the government needs to do. So what's the balance here? Where do you see yourself falling out in terms of who is going to lead this transformation?

Dr. Eric Topol: Yeah. This is a public-based consumer health revolution I think that has to unfold, this is not going to come from the government and certainly not going to come from the medical community. But we have learned from examples of, for example, pharmaceutical company-directed consumer advertising that the consumers can drive their own care. And if we start getting that type of Arab Spring Occupy Wall Street type of movements towards health care and towards a new precise way to render care and move towards the whole axis of prevention which is possible when you know everything about a person that's relevant then I think we can achieve this. I mean I think that was the purpose I put in the effort to do a book just because I thought well finally, maybe we can actually get the activism here which is potentiated now to a level we have never seen. Each week there has been another article which is just amazing like one was, do patients have a right to access their laboratory data? I said, how can you even ask that question? Then the week before that was, do patients have a right to their genomic data? And it really embodies the problem. I mean he doesn't even think that people should have right to their own DNA, to their data. I mean something is wrong with this picture and this paternalistic doctor-knows-best attitude, we have to get over that.

Margaret Flinter: Well, those are great points and we certainly had some very interesting discussions with colleagues about the right to lab data but it looks like that one's been decided for everybody and the patents have that right so that's terrific.

Dr. Eric Topol: Well we are not seeing, there is only like one health system that actually makes that real, Kaiser, but for the most part mostly we can't access their lab data. And this week you have probably saw the Annals of Internal Medicine Papers about sharing the medical chart, your doctor's notes.

Margaret Flinter: Yeah.

Dr. Eric Topol: And again, another example why shouldn't people have the right to access their notes and why are we asking these questions in 2011.

Margaret Flinter: Now I noted in your book, and you didn't spend a lot of time on this but you made the point that really now it is within the power of the consumer to have their genetic code mapped that you don't have to have an order for it and it's not out of the price range of everybody in the country, it's not something that only the very wealthy could do. And yet, I noted when I read that hmm, interesting but most people have not.

Dr. Eric Topol: Well there is two points there. One is like we are kind of right in the middle of where before you could only get a genome-wide scan which is just looking at a million markers and not providing that much insight and that was where the consumer genomics companies got started in late 2007, and we are right at this transition to whole genome sequencing. So the question is, well why bother with the scan right now for a few hundred dollars when you can have your whole genome sequence every one of the six billion letters and get a whole lot more information? So that's one part of it. The other one is that the American Medical Association and I did write about this in the book have been doing everything they can to lobby the government to prevent people from accessing their data.

Margaret Flinter: I noted that, right.

Dr. Eric Topol: And this is a problem because like I said, we are right in this transition where it's very rich opportunity to get everything you could possibly know about your own sequence DNA and patients did very well to know their genome-wide scan data. Thousands of patients that we studied did perfectly fine without psychological trauma but still the AMA is taking that on, lobbying the FDA for people not to have their data directly but only ordered through physician.

Margaret Flinter: Well you know Dr. Topol we are talking about change that has to go deep and all this radical change also requires us to think about pretty big change in the education and training of the health professionals, right, and the health profession students. And we know if clinical medicine and nursing and the other professions are slow to change, the education can be even slower. What are you doing at Scripps? How is your work fundamentally transforming medical education to embrace this new arena?

Dr. Eric Topol: Well we do things to educate the medical community on genomics and we have had specific programs whereby for example the very commonly used drug Plavix where we got all the physicians that are involved in treating patients with Plavix educated about genotyping and so that when patients have a

stent placed that they know that they are going to get a genotype and the medication, the regimen they get is going to be affected by that information. So we are doing the same now for hepatitis, for the gastroenterologist and internists who treat those patients with respect to their drug interferon and we are hoping to soon in the New Year to start another program in diabetes genomic. So that is our plan is not to try to do it all but with specific programs, the right physicians and health care professionals working in that to get them up to speed and to hopefully buy into a new order of medicine.

Mark Masselli: Dr. Topol, when you look around the country and the world what do you see in terms of innovation and who should our listeners at Conversations be keeping an eye on?

Dr. Eric Topol: Yeah. I mean I think there are different fronts. I mean I think there are many centers now that are starting to figure out that genomics can make an enormous difference in how we approach patients so there are many centers throughout the US and abroad that are focused on that. I mean we are starting to see this movement from gene hunting research to now applying that information in the practice of medicine. And then on the other hand in parallel there are similar things with the BioCenter movement which was in health and fitness but is just now getting into the whole medical sphere. And so we haven't seen it integrated yet. That's one of the unusual vantage points that we have in La Jolla because we have got these different institutes working together. So that whole idea of this panoramic view of each individual, there isn't enough of that going on yet but hopefully it will in the near future.

Margaret Flinter: Today, we have been speaking with Dr. Eric Topol, leading proponent in the use of genomics, Director of the Scripps Translational Science Institute and Vice Chair of the West Wireless Health Institute. Dr. Topol, it's been a pleasure to have you on the show. Thank you so much for joining us on Conversations.

Dr. Eric Topol: Well thanks very much for having me.

Margaret Flinter: This is Conversations on Health Care. I am Margaret Flinter.

Mark Masselli: And I am Mark Masselli, peace and health.

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