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

Margaret Flinter: And I am Margaret Flinter.

Mark Masselli: Well Margaret, another state has posted some interesting financials regarding health insurance rates on their insurance exchanges set up to provide coverage options under the Affordable Care Act. In a while it may be too soon to call it a trend, its promising news.

Margaret Flinter: That's right Mark, the State of New York which is setting up its own insurance exchange has listed the rates for the 17 insurance providers who are participating in the exchanged and the rates are on average 50% lower than present rates on the individual market. The Governor of New York, Andrew Cuomo issued a statement that folks current paying a \$1,000.00 a month for health insurance could pay as little as \$300.00 for coverage on the exchange. That's really quite remarkable.

Mark Masselli: That is great news and of course we saw the same story in California which already is listed rates for, it's insurance exchanges, so both coast have good news.

Margaret Flinter: It looks like market forces are doing what they expected, applying downward pressure on the cost of insurance and that's certainly a positive.

Mark Masselli: Yes it is but something that's not so positive according to a recent survey of the nation's doctors, show there are largely clueless about how the health care law is going to work.

Margaret Flinter: Well the survey showed also some real skepticism about how the law will be implemented on the 11% felled at the insurance exchanged would be ready for customer by the October first deadline and an amazing 65% still had no idea how those being insured through the exchanges would impact their own practice.

Mark Masselli: And this poll shows there hasn't been an effective enough information campaign to inform those on the provider side but I see that the president is out on the **(1:38 inaudible)** around the country talking about the Affordable Care Act.

Margaret Flinter: Well you know Mark it's not so surprising people who deliver health care pretty busy delivering health care, they may not have been able to master all that information for themselves or their patients and we hope there's a really affective communication strategy that will continue to unveil over the couple of months. We know the states and federal government are spending a lot more time doing that in the coming months and a lot to wrap your arms around.

Mark Masselli: They are, certainly is. Speaking of brainpower Margaret, that's something our guest today knows quite a lot about. Dr. William Newsome is co-chair of President Obama's 21st century "BRAIN" initiative whose goal is to ultimately map the human brain.

Margaret Flinter: Deeply complex test that some say could take years even decades but will revolutionize our approach to all disorders of the brain so pretty exciting work.

Mark Masselli: That it's is. Lori Robertson from Factcheck.org checks in with another uncovered mistruth about health reform but no matter what the topic you can hear all of our shows by going to chcradio.com

Margaret Flinter: And as always, if you have comments, email us at www.chcradio.com or find us on Facebook or Twitter because we love to hear from you. Now we'll get to our interview with Dr. William Newsome in just a moment.

Mark Masselli: But first, here is our producer Marianne O'Hare with this week's Headline News.

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Marianne O'Hare: I am Marianne O'Hare with these Health Care Headlines. Detroit's Money vows and healthcare since the bankruptcy filing of the Motor City retirees living on a city pension including health insurance coverage are bracing for a hit. Officials handling the city's \$18 billion budget shortfall are considering pension cutbacks, the question is how much? The pension shortfall accounts for \$3.5 billion of the \$18 billion shortage. Many retirees faced with the prospect are thinking they'll have to find a job to offset those loses. Detroit's Emergency City Manager is calling for significant cuts. Significant cuts in insurance rates have been revealed in New York State which unveiled some of the pricing for the insurance exchanged being set up in the Empire State. Governor Andrew Cuomo announcing rates for those seeking coverage on the exchange on New York will average about 50% less than rates on the open individual market but analyst warn that dramatic drop may not be repeated elsewhere like it has in California and New York.

And one state's coverage vacuum has created a business opportunity. Humana is going to cover those parts of Mississippi left uncovered in that Southern State. Mississippi is neither setting up an exchange or expanding Medicaid to include more coverage for those living close to the poverty line leaving tens of thousands of residents without any other option thus having them remained uninsured. Humana says it will sell subsidized coverage to the 36 counties that would have been left out of the game.

And 3D printing and the old fashioned cast break an arm or a leg and plaster cast six to eight weeks, it becomes increasingly itchy, cumbersome, sticky, uncomfortable, enter the cortex a 3D printed custom cast seem simple enough. A person shows up at the ER with a broken bone that doctor assesses the damage with an x-ray and then makes

a 3D scan of the limb. With a 3D printer the doc prints out a made order cast called the Cortex, snaps it into place and viola off they go. Patients get a super hear wish exoskeleton. It's sleek, breathable, durable, and perhaps best of all shower ready, although admittedly harder to sign.

I am Marianne O'Hare with these Health Care Headlines.

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Mark Masselli: We're speaking today with Dr. William Newsome, Professor of Neurobiology at Stanford University, School of Medicine. Dr. Newsome was just appointed as Director of the newly created Interdisciplinary Neurosciences Institute at Stanford University. As well as being named co-director of President Obama's 21st century "BRAIN" initiative which seeks to develop a framework to correlates scientific efforts in a quest to map the human brain. Dr. Newsome is also an investigator at the Howard Hughes Medical Institute. He's a winner of numerous prestigious awards including the Distinguished Scientific Contribution Award for the American Psychological Society and is an elected member of the National Academy of Science. Dr. Newsome, welcome to Conversations on Health Care.

Dr. William Newsome: I am pleased to be here with you Mark.

Mark Masselli: Dr. Newsome congratulations on your selection by President Obama to be a co-director of his \$100 million 12st century "BRAIN" initiative which is seeking multidisciplinary solutions to unraveling the mystery of the brain. The project's been likened in scope to the mapping of the Human Genome. We're fortunate to have Dr. Francis Collins and really describing that initiative but currently the nation spends about \$5 billion a year on all kinds of brain research. So I've got to assume that this \$100 million is going to have a synergistic effect. Tell us a little more about what sort of discoveries and payoffs you are hoping this project will yield.

Dr. William Newsome: Well it is really unique time in the history of neuroscience. Those of us who've been in the field for a few decades really sense that the rate of change is -- has been accelerating enormously in the last five years and we are -- it's only the beginning of this acceleration and the real difference maker here is the invention of new technologies that fundamentally allow neuroscientist to ask questions that we had only been able to wonder about and reflect about in the past but now we can really ask them experimentally and very new things are happening, there's change of foot that it's making many of us who are experimentalist have to rethink what it means to be an experimental neuroscientist and what questions we should be asking. And I think what we're shooting for here is really nothing less than a revolutionary kind of understanding about how all of this electrical activity in our brains makes possible the mental lives that we all have, our thoughts, our aspirations, our goals, our memories, our ability to learn. We really want to understand the biological mechanisms that make these things possible and these new fundamental technologies are going to be a quantum leap along the way here. And a charge from President Obama is really to try

to understand the brain at this very basic level. I'm sure that these are going to have positive outcomes for our understanding of disease as well.

Margaret Flinter: Dr. Newsome, you've been I think quoted to saying that the complete mapping of the human brain won't take years like the Human Genome Project did and I of course I was prepared if you want to then say it will only take a year or two and instead I think you said it might take decades which is why the President referred to this as a 21st century initiative. Now I think you've also referred to the brain as a three pound massive goo between the ears.

Dr. William Newsome: Yes, exactly.

Margaret Flinter: But at the same time as the most complex known entity in the universe so let's talk about the complexity. What are the challenges, why is it so hard, why is it going to take decades do you think?

Dr. William Newsome: Well you said the keyword Margaret. The keyword there is complexity. So this three pounds of goo inside our head and I refer to it as goo because that literally is inconsistently if you -- neurosurgeons know that you know it's about the consistency of Jell-O or toothpaste but inside that three pounds that you say is the most complex entity in the universe that we know about. So in each one of our heads that three pounds contains 100 billion neurons, okay, so these are nerve cells that communicate with each electrically and it's that electric communication and that circuit activity that somehow underlies our mental lives so you have 100 billion nerve cells and then each of those nerve cells is making 1,000 synaptic connections, little chemical connections with other cells and these synaptic connections are sort of the points of information transfer.

So you've got 100 billion neurons each with a 1,000 synaptic connections that means you have a 100 trillion of these synaptic connections and just to map that kind of complexly interconnected network is incredibly daunting and we've done calculations that say in a human brain you know if we really map these connections carefully and thoroughly, we would fill up many terabytes worth of disks with information just to one brain and we don't know how to even handle data cyst **(10:04 inaudible)**. Okay this is right out of the hairy edge of what computer science is able to handle at this point.

So our ability to actually get the information out, what is that anatomically meant network and what is the electrical activity in each one of those cells is daunting and then if you could imagine techniques that allow you to do that, just the massive amount of data and how we would handle, how we would analyze it and how we would mind is itself daunting. So I think you know when you look at those three things chained together, you can start seeing why we say this is not something that's going to be done in a year or two years or even 10 years but this really is a grand challenge for the 21st century.

Mark Masselli: You know Dr. Newsome you say this is a spectacularly good time to embark on the quest of mapping the human brain and because of the recent technological breakthroughs. I wonder if some of those technology breakthroughs are in the sort of big data capabilities that we have because the -- is the technology on the mapping capabilities is also the technology on the neuroscience side.

Dr. William Newsome: The technology is on all of these fronts. I mean that's one reason I say it's a spectacularly appropriate time for this. I mean the Obama administration, they got this one right. Okay this really is the right time, it's the right topic at the right time and the technologies really do create the potential for revolution over the next couple of decades. I kind of like in this too trying to understand traffic patterns around New York City and information for around New York City. So we could take out a road map and we could look and we could see all the connections of the roads and exactly where each road runs. We need that in the human brain and in animal's brains and that's sort of what I call neuro-anatomy, just knowing where the cells are, where they make their synaptic connections to other cells so that you have the static roadmap. But that road map if you look at it of New York area, doesn't tell you what traffic is flowing on each road at any moment of the day, right. That's a dynamic property, that is information flow within that network approach and it's the same way in the brain, just knowing the map doesn't tell you what sorts of information is flowing in circuits at different times. So there's no one answer to the -- this questions about activity and dynamic activity. It depends on what you are doing.

So we need the new technologies but we also are developing new technologies, unprecedented new technologies to get that dynamic activity, to measure the traffic on the roads, to measure the traffic in the neurons. And then you need to develop, if you have all of these -- this information you need to develop a theory, right how are the things working and so now we have statisticians and physicist and mathematicians coming in to help us develop theories about these new data sets that we're acquiring and why don't you develop a theory really want to be able to perturb the system you know you say aha I have a theory now how this work you know. I want to go in and I want to change the traffic on this one road and see if I can predict the changes that will happen on other roads. And we're developing new technologies for perturbing the activity in the nervous system. So on all of these fronts we have really new technologies that are enabling us to do these things that we've never been able to do before.

Margaret Flinter: Well Dr. Newsome, I'm struck into your comments how clearly the importance of the interdisciplinary teams comes forward. This does not appear to be an area where siloed research is going to get you very far and you've got now an interdisciplinary neuroscience institute that you are directing at Stanford which is going to help provide a framework for the national BRAIN initiative. Tell us what the new research paradigm looks like and tell us specifically about the institute.

Dr. William Newsome: Well the institute here at Stanford is a new attempt to integrate bringing research across the entire campus and we have a lot of traditional neuroscience

research here in the School of Medicine at Stanford and in the department of biology and to some extent in the department of psychology but we all realize and we're fortunate that our president and provost here at Stanford realize that the brain is not longer just a problem in biology. I mean it may never have been. We were just too clueless to know it in the old days but today we realize you know that these new technologies that are transforming our understanding or coming from all different directions.

So the latest technologies that give us the best mapping, this new clarity technique that is fundamentally coming from chemist, it's coming from chemical treatment of the brain that render an animal brain for example transparent so that we can look all the way through it in and trace these fiber pathways all the way through it without having to cut the brain up into little pieces and analyze the pieces individually. So chemistry is playing a big part. In terms of the large scale activity recording optics and physics are playing a large part. We're actually now monitoring the activity of tens of thousands of neurons at a time through optical means and new microscopes that have been invented by physicists and engineers. **Perturbation** ability to perturb results from genetic manipulation of certain cells and putting in sensors in the certain cells that allow us to shine light on those cells and create excitation or inhibition on those cells and that technique was just invented seven or eight years ago here at Stanford, it's called Optogenetic.

But that's coming from genetics and molecular biology and when we get these realms of data we have to involve the engineers, the electrical engineers help us make better electrical measurements and then the electrical engineers and the computer scientists are teaching us about algorithms and about how to sync so we're trying to raise philanthropic funds and create pools money that will incent our faculty to get out of these disciplinary silos as you say. We want to create a new culture of brain science where by electrical engineers and molecular biologist and then traditional neuroscientists are working together in an iterative loop so that ideas flow from the theorists into the experimental labs. They get tested in the experimental labs, the results go back to the theorist and the experiment say hey you guys were wrong about those, what's the deal and have these iterative loops going back and forth between the physical scientist and the engineers and the experimental neuroscientist and we need you know we need to prime that part so no matter how interested they are, if there's not some money to fuel the process, it's not going to go forward and that incidentally plays right into national Obama BRAIN initiative, right. This is the kind of thing that the BRAIN initiative should do nationally.

Mark Masselli: We're speaking today with Dr. William Newsome, Professor of Neurobiology at Stanford University, School of Medicine. Dr. Newsome was just appointed as Director of the interdisciplinary neurosciences institute at Stanford University and also named co-director of President Obama's 21st century BRAIN initiative which seeks to develop a framework to correlates scientific efforts in a quest to map the human brain consider the last frontier of modern science.

Dr. Newsome I'd like to talk about the president's "BRAIN" initiative that you talked earlier about pulling together the best and the brightest and you are a co-director in this project as Dr. Cori Bargmann noted neuroscientist from Rockefeller University and the President referred to the two of you, it's a dream team and she said it's a daunting even monumental task so tell us if you would, how your team is planning to undertake the challenges and where are you in the process at this moment.

Dr. William Newsome: So Cori and I are chairs of a committee, a planning committee for the NIH. It's our task to sort of survey whatever the field is now, where the big opportunities lie, where are the new technologies are creating opportunities that absolutely have to be exploited and make recommendations to the US government agencies about how to exploit this and where to go. We have a great committee of 12 people in addition to ourselves representing all areas in neuroscience and this is what Collins referred to as the dream team. It's an outstanding team, so one of the main things that we've done is realized we don't have all the answers on our committee and we are opening this up to an outside process so we're holding a series of workshops over the summer where we're inviting a dozen or so experts and each of four individual fields in to talk with us. so these experts give us talks about what do they think their part of the field is and where it should go and then we two or three hours for afternoon discussion where we really sort of get into and debate and what are the merits of this approach versus the other approach.

So we're getting this input from a large community, we've also got blank site setup where we can information from individuals, late during the coming year we'll be getting input from potential foundation and company partners, private company partners, that's one part of our charge. So we'll be looking carefully at that. We'll be hearing from patient advocate groups because I think that's a very important perspective to get you know to really hold our feet to the fire about disease and you know for a lot of patients and a lot of your listeners on this radio station, this is not abstract, this is not fun and games, this is really -- this is real life. I was kind of skeptical about this and-- but I was inspired by Cori to actually be a part of this. Cori finally said, she just look, if this is what President Obama's time and he thinks it's worth his time to push this thing then we simply have an obligation to go along and produce the very best plan that we can do. I said Cori you are right, we've got to do this thing together. So she about the best co-chair I can imagine working with but we have a fantastic committee and I can assure you we are all working very hard this summer toward our preliminary report, that's due in September.

Margaret Flinter: As you've spoken it's sounds like the charge is really more at the hundred thousand foot level if you will of understanding what's normal before one dives into what doesn't work and what's not normal. Is that safe to say?

Dr. William Newsome: That is out charge and out charge is more specific than that actually I mean one misconception out there is that somehow we're doing some master plan for all of neuroscience and that is not true. Our charge specifically talks about the dynamics of brain activity, all this sort of firearm of electrical activity that's going on in

your brain right now and going on in Mark's brain and going on in my brain and those are all your listeners, I mean there'd be millions of neurons firing off these millions of actions potentials and our charge is really to understand how the dynamics emerging out of that densely connected network gives rise to that mental life. Okay that's what the NIH charge and publically available on the NIH website. Now of course much psychiatric disease is related to experience, right that's the way we feel it, that's why people come into the clinic because they have alerted experiences whether we're talking about depression or whether we're talking about schizophrenia or people have altered experience and we need to understand how the nervous systems gives rise to experience in the first place and then how disorders in the nervous system give rise to these disorders of experience. Now my gut feeling is that the answer to some neurologic disease is that we all care about.

My gut feeling is that the answers for those disease are going to come at the molecular and cellular level and then maybe that the global brain activity is not highly relevant to Alzeihmer's and Parkinson's, I don't know. But there are other diseases like the autism spectrum disorders and like schizophrenia that are probably -- my hunch is they are going to come down to disorders and connections between the neurons, right. So I think that the brain activity map that we're sort of you know honing in and here is this dynamical activity will be highly relevant to some of the diseases and might be less relevant to others but we're not going to know and we're not going really be able to make that call until we start making progress on this with the new tools at our disposal. From much psychiatric and neurological disease right now we're just stumbling around in the dark. And my father died about 10 years of Alzeihmer's and I know we're largely stumbling around in the dark and Cori says our job, the job of this BRAIN Initiative is to turn on some lights, okay. So you know when we start turning on lights, some of this darkness hopefully will be dispelled.

Mark Masselli: Well and there are number of people who are trying to do that. We've had Representative Patrick Kennedy on and Patrick's certainly working with his group on the one mind for research. We can love to hear your thoughts on those collaboration and sort of it as aside more of a geeky questions but there's a lot happening with 3D Imaging of the brain and I also know that the 3D Printing is really taking some gigantic steps forward. Do you see at a time where this is going to play a role in terms of trying to print out element of the brain that you've been able to map through imaging?

Dr. William Newsome: Yeah well I think that's an incredibly fascinating area and there are these pockets that's really bright people out there who are laying the --- you know they are taking neurons, nerve cells that are grown in tissue culture and they are trying to assemble them into actually functional circuits inside of you know petri-dishes and artificial situation. So using particular molecules to guide the axons to hook up with other cells in creating little neural circuits so this is the kind of things, it's kind of like pointing a printed circuit board expect we're actually using live cells and trying to get them hooked up in ways that not do elementary computations and that -- you know the long term implications of that research is that -- is to be able to recreate circuits inside natural brain. So when some groups of cells does decide up and die maybe it's not

enough just to put stem cells into that place. Maybe those stem cells actually have to instructions, molecular and chemical instructions about how to wire up together and if we can understand what those molecular and chemical instructions are in the sort of printing kind of thing in the lab then that that will obvious help us create those structures and networks inside the brain.

So I think you know when you think about that kind of research, 10, 20 years down the road, it's about getting cells ultimately into real brains and helping the, hook up with their proper partners to actually recreate circuits. It's not enough just to throw cells into the brain. It would be like you know your computer's broken and if the repairman came out and just took the top of your computer and he took a bunch of transistors and just sprinkled them in there randomly and close the computer and say well let's see if that fixes the problem, you'd think he was an idiot right. So it's kind of like that we can just take a diseased brain and sprinkle cells in there randomly and say let's say if it fixes itself. We actually have to know how to get to those cells integrated into the circuitry in a way that will the thing work. So that's the long term goal that kind of research and I think it's a very promising one.

Margaret Flinter: We've been speaking today with Dr. William Newsome, Professor of Neurobiology at the Stanford University, School of Medicine and Co-Director of President Obama's 21st century "BRAIN" Initiative which seeks to correlates scientific efforts in the quest to map the human brain. You can learn more about Dr. Newsome's ground breaking work by going to monkeybiz.stanford.edu. Dr. Newsome Thank you so much for joining us on Conversation on Health Care today.

Dr. William Newsome: You are welcome Margaret and Mark, nice to talk with.

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Mark Masselli: At Conversations on Health Care, we want our audience to be truly in the know when it comes to the facts about health care reform and policy. Lori Robertson is an award-winning journalist and managing editor of FactCheck.org, a non-partisan, non-profit consumer advocate for voters that aim to reduce the level of deception in US politics. Lori, what have you got for us this week?

Lori Robertson: Well President Barack Obama recent spoke in glowing terms as how Americans could save money on premiums thanks to the Affordable Care Act but he left out several details increase in law. Obama said that 8.5 million rebates are being sent out to consumers averaging about a \$100 each. He's referring to a requirement in the law that insurance companies spend at least 80% of premiums on health cost as opposed to things like marketing and profits or overhead. If insurers don't need that 80% mark, they have to refund part of the premiums.

This is a second year for such refunds but 8.5 million Americans aren't going to receive rebate tax of a \$100 this summer. For one thing the administration says the plan benefits 8.5 million Americans but the \$100 figure is per family not per individual. All

told \$500 million is being sent out. Also not everyone gets a cheque. Americans who buy their own insurance will and 2.7 million of consumers who will benefit from this aspect of the lot due by their own insurance but the rest are on employer plans and the rebates for these plans go to the employer. If employers pay part of the premium, they are entitled to part of the rebate and any benefit for workers would have to be passed along through the employer. It's not exactly the same. It's receiving in the mail. Obama is ready to say that this is a clear benefit of the law. Consumers will get rebates and insurance companies are limited and how much premium dollars they can use for non health related costs but the president doesn't quite tell the whole story. And that's my fact check for this week. I am Lori Robertson, managing editor of FactCheck.org.

Margaret Flinter: FactCheck.org is committed to factual accuracy from the country's major political players and is a project of the Annenberg Public Policy Center at the University of Pennsylvania. If you have a fact, that you would like checked, e-mail us at www.chcradio.com. We will have FactCheck.org's Lori Robertson check it out for you here on Conversations on Health Care.

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Margaret Flinter: Each week, Conversations highlights a bright idea about how to make wellness a part of our communities and everyday lives. Of the roughly 2.3 million American soldiers who've returned from multiple tours in Iraq and Afghanistan as many as 20% have returned with so called invisible wounds, post traumatic stress disorders, traumatic brain injury, anxiety, depression and stress. While the Federal Government has been shining a spotlight on the problem, they simply aren't enough soldiers getting the treatment they need and their families and loved one suffer alongside them. Dr. Barbara Van Dahlen is a licensed clinical psychologist who saw the need growing and decided to do something about it. In 2005 she and a handful of colleagues launched an organization dedicated to creating a network of volunteer counselors and therapist who would devote their time to treating soldiers and their family members. It's called Give an Hour.

Dr. Barbara Van Dahlen: We're a national network of mental health professionals. We provide free mental health services to our returning troops, their families and their communities.

Margaret Flinter: And her organization has grown. She has created a network of 6500 licensed therapist in all 50 states the District of Columbia, Puerto Rico and Guam and they have provided thousands of hours of free therapy to all that are into reach out to them. And they are also working with the federal government initiative to train the next generation of doctors in mental health professionals to recognize the unique characteristics of PTSD and related conditions. Dr. Van Dahlen is planning to expand her services to families who suffered the long-term effects from the recent storms that have impacted the North East. Her work landed her in Time Magazine's 2012 list of the 100 most influential people in the world. Given hour, creating a network of volunteer therapist for helping soldiers and their families who suffered from the impact of their

service using that network to better train future clinicians to treat these disorders, now that's a bright idea.

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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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