Mark Masselli: This is Conversation on Healthcare, I am Mark Masselli.

Margaret Flinter: And I am Margaret Flinter.

Mark Masselli: Well, Margaret, it is hard to believe that it has been just a few weeks since the terrible massacre in Las Vegas and we find ourselves waking up to another similar tragedy. A gunman with an assault weapon fired on a small congregation of Texans, 26 dead and again we hear another course of calls for thoughts and prayers.

Margaret Flinter: Well, we add our own thoughts and prayers, but as stewards of public health, Mark, I think we are seeking more substantive action.

Mark Masselli: There are some 33 thousand gun-related deaths per year in this country and in the past year alone, over 300 mass shootings. The crisis calls for decisive policy action.

Margaret Flinter: I understand that many of those, nearly 600 victims who were wounded and required hospitalization did not have health insurance and their families have had to kick start campaigns to help pay for their surgeries and their recovery. So we want to take this opportunity to remind people that this year's open enrolment for health coverage is underway right now, please make sure that you and your family are covered for next year.

Mark Masselli: There are only a few weeks left of open enrolment for those seeking coverage on the Federal exchange. Simply go to healthcare.gov. Here in our State of Connecticut, it is Accesshealthct.com. There are specialists available online or on the phone to answer your questions and help you navigate the sites.

Margaret Flinter: And in the meantime, we'd like to peer into the future and see what kind of trends will be influencing the healthcare of the 21st Century and in the case of today's guest, blockchain for healthcare, a secure way of sharing data and currency across connected networks.

Mark Masselli: And Dr. Samir Damani is a cardiologist, researcher, and entrepreneur based at the Scripps Clinic in California and is the found of MintHealth, a global personalized electronic health record based on blockchain technology.

Margaret Flinter: And Lori Robertson will stop by, the Managing Editor of FactCheck.org. But no matter what the topic, you can hear all of our shows by going to www.chcradio.com.

Mark Masselli: And as always if you have comments, please email us at www.chcradio@chc1.com or find us on Facebook or Twitter, we love hearing from you.

Margaret Flinter: We'll get you our interview with Dr. Samir Damani in just a moment.

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

Marianne O'Hare: I am Marianne O'Hare with these Healthcare Headlines. Closing in on a deal, health insure Aetna getting closer reportedly to finalizing a deal with pharmacy chain giant CBS Health Corp for merger of the two entities worth about $70 billion, Reuters knew cites a source close to the still secret negotiations. The deal is set to be announced in December. The president's trip to Asia sparked a testing back and forth over the role China is playing in the opioid crisis. The administration recently declaring the opioid epidemic a national emergency with drug overdoses now leading cause of accidental death in this country; some 20 thousand of those more than 50 thousand deaths blamed on the proliferation of fentanyl into the illicit drug market. Drug enforcement experts have a long length of flow of fentanyl into this country from sources in China; China vehemently denying the allegations. Opening moment underway for insurance coverage for next year under the Affordable Care Act and the uncertain policies regarding the health law coming out of Washington and the president's decision to take away those cost reduction subsidies to insurers to help keep costs down for consumers, means many consumers, especially those making too much to qualify for tax breaks are looking at much higher premiums this year. Open enrolment ends December 15th for consumers in the Federal exchanges while some States with their own marketplaces like Connecticut have extended open enrolment to December 22nd. And some teams Arkansas have designed a device that would impact the number of children dying by heatstroke when left inside cars, which kills between 40 to 50 children a year. The 9th grade robotic students from BB Arkansas have designed a sensor they call Baby Saver 2000, a sensor that could be attached to any baby car seat, which registers the temperature inside a closed car and automatically sets of the panic button on the key fob and also sets off the car's alarm systems. The enterprising team's invention earn them a $10,000 award. The young entrepreneurs are continuing to develop their prototype for wider testing and distribution. I am Marianne O'Hare with these Healthcare Headlines.

Mark Masselli: We are speaking today with Dr. Samir Damani, founder and CEO of MintHealth, a company utilizing blockchain technology to built a portable secure and soft governing personal health record. Dr. Damani is also founder and Chief Medical and Strategy Officer of MD Revolution, which aims to build a technology enabled platform for clinicians working in chronic care management. Dr. Damani earned his Doctor of Pharmacy at the University of Georgia and his

MD at Medical College of Georgia. Dr. Damani, welcome to Conversations on Healthcare.

Dr. Samir Damani: Thank you.

Mark Masselli: You know are hearing a lot of buzz around the emergence of blockchain technology and its potential game changer, but I think for most people it is probably still a mystery of what blockchain technology is, but we have many people who sort of betting on this technology pointing to blockchain potential for creating safely encrypted financial transactions, as well as a secure platform for storage and sharing personal health data and I am wondering how it works both in theory and practice and what motivates you to be translating this into the healthcare area.

Dr. Samir Damani: I think it is important to understand that 40 of the 56 million annular deaths that occur globally occur from preventable chronic condition and what is even more important is that modifiable risk factors including obesity, hypertension, sedentary activities, tobacco use, and poor nutrition represent over 70% of the risk for development of dying conditions and patients today have taken the path of physician and their health to their provider kind of dominant and silent clinical and behavioral data. The blockchain enables to help solve in patient control health record that is tied to a global unique identifier. It allows for the seamless and secure transfer of clinical and behavioral data between patient authorized stakeholders and so blockchains are essentially the centralized ledger of all transactions across the peer-to-peer network and using this technology any participant can confirm the transaction without the need for any kind of central certifying authority. Let's say I want to transact with you, this requests a transaction that you broadcast a peer-to-peer network of computers known as nodes. These nodes then validate the transactions and the user status through algorithm, so over a period of 10 minutes for example the Bitcoin network processes all these transactions into a block, then these nodes then validate those transactions every 10 minutes and there's a hash that represents the block and there is a mathematical formula that has to be solved and that's what this peer-to-peer global network open source is actually doing. It is actually validating that algorithm and that verified transaction involves financial currency, it involves contracts, records, other information and then once it is verified, the transaction is combined with these other transaction added as a new block to an existing chain that is completely orderable, open source and essentially immutable, so if there is a previous block that gets hacked then the blockchain would get essentially disrupted. What this allow is you know at least in healthcare, you would have an EHR, some sort of data repository that would be needed in order for patients to get data, but what can happen now is blockchain essentially eliminates the middleman and allows for seamless and secure transfer of data or information and that gives patients control.

Margaret Flinter: We have heard that the stumbling block was the interoperability between systems and overcoming the slios of having this kind of technology and how does blockchain bypass or overcome the issue of interoperability of records?

Dr. Samir Damani: Absolutely, I mean the data silos that existed, they really preclude our ability to deliver personalized care and you know is the reality is that you when Mary goes to see her primary care physician, there is data resides in her EHR of Dr. Jones, but she may see a specialist that has another EHR, medical imaging might reside in Dr. Jones' separate administrative or medical imaging PACS system server, then Mary, who is a diabetic and hypertensive patient probably has her blood pressure written on a sheet or may be it is an App and all those data is kind of spread everywhere. You wouldn't even imagine that patients own this data, because they got to through this really arduous process of getting all these red tape administrative kind of bottlenecks to get their own data, the redundancy of tests that occur, so it is a real mess and so what basically blockchain would allow is for all these different you know health Apps, variables, implants, EHRs, imaging, all of that to be secured in the cloud tied to a unique identifier that can then be accessed by anyone that the patient deems appropriate and can be written into the blockchain. So we are not trying to replace EHRs, in fact I spoke with a CEO of a large EHR company like it is the digitization of the electronic health records is very important, we have the digitized data, but to move into value based care, we have to give ownership of the data back to the patient and that EHR is a really line management software and what really can happen with the blockchain now is that Mary can go to Dr. Jones and she will have an application or platform like MintHealth that would essentially tie her personal record to a cryptographic key, then Dr. Jones would scan that cryptographic key via an actual QR Code. Dr. Jones would then have access to her behavioral information on diet, nutrition, blood pressure, and two to three weeks later, she goes to her cardiologist Dr. Smith and he can access any CAT scans or echo's that might have been done at the other site and at the same time he scans Mary's cryptographic key, so now Mary now has Dr. Smith's information in her file and over years you start building this personal cloud storage, where medical imaging data, behavioral data, clinical data stays there and that data can then be moved to anyone and accessed in real time and so now you basically can then share that data with whoever you like in real time on the blockchain or through the blockchain and so the interoperability issues really is solved. You know EHR companies have really claimed to build these kind of clunky legacy systems in the name of security, but the reality is that they benefited from having these old legacy systems, where it makes it difficult for you to pull and push data to it. You know, the beauty is that there are visionary CEOs and that are really excited about blockchain and see themselves as partnering with the physicians and patients to value based care, but we need patients that have more access to the data and then you can also layer a token mechanisms where payers and providers can start incentivising healthy behaviors on behalf of the patient, where they can start getting rewarded.

Mark Masselli: You certainly are a visionary in patients should own their own information, but you've taken it one step further as I understand as an App that patients can actually use that will allow them to have control of that, is that what MintHealth is doing right now?

Dr. Samir Damani: Yeah, so MintHealth is basically taking blockchain technology and we've seen you know millions of dollars of savings due to some of the simple behavior like things we talked about, but one of the basic things we noticed was that by incentivising patients, you can get even more benefit from the human interaction that we do today and you know self monitoring, self tracking, combined it with human interaction and a clinical that pool that sorts data in a way that allows us to engage patients on a very personalized level, the Government has done a great job of incentivising providers for non face-to-face care through these new codes, like chronic care management, behavioral health codes, but they are lacking the incentive for the patient and so what MintHealth is doing is taking existing technology on the patient engagement side, but also taking technology from a cofounder side where they built an actual medical imaging platform, where they are able to get medical imaging data from the cloud and render it and stream it instantaneously to an iPad or an iPhone, which has been a huge challenge just because of the size of these images and so if we could put not just medical imaging in the cloud, but patient data in the cloud, and then form a patient engagement model that is tied together by a token called a vitamin, that could be a powerful model not only for the storage and in creating a self sovereign record for the patient, but also creating a model to drive down the cost of healthcare and will be deploying that to commercial insurance companies, who then would essentially use those tokens to incentivise positive patient behaviors.

Margaret Flinter: Well, Dr. Damani, it seems that the value would be best brought to the entire public as a public utility. A unique identifier like our Social Security Numbers in the U.S., you as an individual could amass that data, because otherwise we always seem to be caught at the bridge, where the patient has now changed from one plan to another, what kind of discussions or thoughts are you having with public payers or policy makers about the potential for this as a public utility versus siloed somewhat into individual insurance entities?

Dr. Samir Damani: The chronic pain management code was trying to pay doctors 20 minutes for non face-to-face care management back in 2015, was the first code ever of its kind to reimburse, it was actually a CMS initiative and was not an insurance sponsored initiative and this is a major strategy for them to say, listen people service, medicine is here to stay, but they want to start incentivising the right kinds of services, which is why this code was so beautiful and so what we did is we saw in the Mississippi population of 3500 patients that we were able to do a pretty sophisticated case control matching case study and showed that we had about 3.5 million in actual reduction inpatient hospital plans compared to

that to about 800 thousand that they spent during the eight-month period on the program. So we shared that with CMS and they really loved it. You know, we've seen an intense amount of interest for anything that is going to get patients to engage and if you look at the recent MACRA legislation, which came out in 2015, it was bipartisan. You can actually see that now MIPS, which is the Merit Based Incentive Payment System is a system by which anybody who is taking care of Medicare patients, you get penalized if you don't have certain metrics and improvements or benefit care information of quality and part of those metrics are engaging patients for preventative and encouraging them to have healthier behaviors and in fact we have already started to engage and as we show fairly success over the next 12 to 18 months, we definitely have in mind that this would be platform that the Government, not only of the U.S., but other countries that are suffering from chronic disease would want to use.

Mark Masselli: You know, Dr. Damani, I notice the Forbes magazine had eight reasons to be skeptical of blockchain technology and because of the inherently distributed peer-to-peer nature of blockchain based transactions can only complete when all parties update their respective ledgers, what are your thoughts about the nay-sayers about the technology?

Dr. Samir Damani: There is no question that this technology is going to transform every business that require declaring this now, just from things like identifying voters to property ownership and so many things where bottlenecks exist right now because of that. Yes, there are some bottleneck issues, you are right. Right now, you know they can only do a certain amount of transactions per second, but there are new blockchains that are emerging right now like ELS, which actually is claiming to be able to do 100 thousand transactions per second. So there is definitely, there is different ways, there is concepts in terms of how you actually verify transactions and there are very innovative models coming out to help verify the transactions in a much more rapid pace. I think right now there is that combine 20 or 30 transactions or somewhere in that second, but you are going to see that scale by you know in an exponential fashion. We will be doing token offering for MintHealth and we've got a pretty strong crypto-based group billed out of token mechanisms that are working on the App currently.

Margaret Flinter: Well, I liked something that I read where you called it a quiet revolution in healthcare being led not just by the big institutions, but by people themselves, certainly with their smart phones and their wearables, it has been just astonishing watching the rise of the use of fit-bit, so sort of gives us a tremendous amount of data, there is kind of alter our step and ready to go some place, but I am really curious are you also laying out research agenda for really trying to identify what does work best and with whom in this patient engagement space, can we look forward to big contributions to those state of knowledge around what we can do to help patients?

Dr. Samir Damani: So out of my medical degree, I got a Doctor in Pharmacy and then after doing cardiology, I actually spent almost four years doing research, ran multimillion dollar grants, so I am very much, I got into the MD Revolution business around patient engagement with the idea that bringing data together at one place would allow machine learning to really reach the promise that we've been kind of pushing for so long. We haven't because the data has been so scattered and siloed and I think the reality in this situation where you have this personal cloud story that's protected by the blockchain that has medical imaging has the clinical behavioral information and also the EHR information in one place that the patient can share now. You have a way that not only are you enabling a central repository, but if you are allowing patients to then decide and we have a very unique mechanism where we are going to allow a lot of patients to board on the way they able to use the data. So if pharma wants to know all the diabetics who are on a certain drug and what their response is then, patients can now volunteer to share that data using the MintHealth application, so research and academic institutions, genetic companies would be very interested because one of the problems with data that is brought in is very disheveled. What we really need is deep data and broad data and you can no longer in the spirit or name of security, we can't give you your data and that's the beauty of the blockchain, the atmosphere is immutable, it is an open source, so you can see everyone that has accessed anything ever. So the answer to that is absolutely, the ability to gather the data allows for machine learning to really reach its full potential.

Margaret Flinter: We've been speaking today with Dr. Samir Damani, practicing cardiologist at Scripps Clinic and Scripps Research Institute and founder and CEO of MintHealth, a company that utilized blockchain technology to build a portable, secure, and self-governed personal health record. You can learn more about his work by going to minthealth.io. Dr. Damani, thank you so much for joining us on Conversations on Healthcare.

Mark Masselli: At Conversations on Healthcare, we want our audience to be truly in the know when it comes to the facts about healthcare reform and policy, Lori Robertson is an award-winning journalist and Managing Editor of FactCheck.org, a non-partisan, nonprofit consumer advocate for voters that aim to reduce the level of deception in U.S. politics. Lori, what have you got for us this week?

Lori Robertson: Senator Rand Paul claimed that the National Institute of Health provided $2 million for a study on whether "kids don't like food that has been sneezed on" that misrepresents the research. The $2 million went to a six-year project composed of multiple studies on children's reasoning about food. One study a video of an actor sneezing on food as a means of understanding if young children can pick up on subtle cues about contamination. Paul also ignored the ultimate aim of the NIH research to contribute to developing ways to nudge kids to make safer and more healthy food choices by understanding why they make certain choices to begin with. The Senator made the claim while advocating

legislation he introduced to change the Federal Grant funding process, but the NIH didn't spend the money to figure out if people don't like food that has been sneezed on. Among the studies in the overall project was one to understand whether kids of various ages can pick upon subtle cues about contamination. The study didn't find that people are less likely to choose food that has been sneezed on as Paul said, that might be the case for adults, but the picture is more complicated with children. The kids were shown a video that led them to believe a blue bowl would contain clean apple sauce and a red bowl would contain sneezed on or contaminated apple sauce. The researchers found that 57% of the 3-to-8 year old ate from both bowls and 28% only ate from the clean bowl. 3-to-4 year olds also ate significantly more contaminated food and rated it tastier. The researchers concluded that subtle cues can effectively impact children's choice, consumption, and evaluation of otherwise identical food, but that influence differs by age. Future researchers needed they said "to understand the scope of context" that might either decrease or heighten children's sensitivity to contamination. And that's FactCheck 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, email us at www.chcradio.com, we will have FactCheck.org's, Lori Robertson, check it out for you, here on Conversations on Healthcare.

Mark Masselli: Each week conversations highlights a bright idea about how to make wellness a part of our communities into everyday lives. Soaring prescription drug prices have been taking a toll on American health consumers, but until now most didn't understand that they might actually have some say in what their prescription drugs cost them. Many Americans have resorted to purchasing prescriptions online, often illegally or overseas. While cheaper, these solutions come with their own risk. So an enterprising pair of brothers have created their own solution. Matthew and Geoffrey Chaiken founded Blink Health, a free online destination that links patients with prescription sources that can be up to 90% cheaper than what's found on the traditional market.

Matthew Chaiken: The way it works is you go to Blinkhealth.com, you look up the name of your medication. The price you see there is the price you get it over 60,000 pharmacies nationwide, that price is less than what you normally pay for your prescription. You pay for it online and we provide you with what we call a digital blink pharmacy card and you show that card to the pharmacist and then your medication rings up to $0.

Mark Masselli: Cofounder Geoffrey Chaiken to CBS News recently, they negotiated prices directly with drug manufacturers.

Geoffrey Chaiken: We actually have contracts with every single pharmacy in United States. What is important for consumers is that when they go to Blink, there is one price that they are going to see. They will get that price no matter which pharmacy they go to.

Mark Masselli: The Chaiken brothers say that customers can purchase the drugs online, but still pick them up at their trusted local pharmacy. Since Blink last year, users have saved millions of dollars on prescriptions and a majority of those prescriptions are filled for $10 or less. Blink, an online site for purchasing prescription drugs, offering consumers an option to safely fill prescriptions at a far more competitive price. Now, that's a bright idea.

Margaret Flinter: This is Conversations on Healthcare, I am Margaret Flinter.

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

Conversations on Healthcare broadcast from the campus of WESU at Wesleyan University, streaming live at wesufm.org and brought to you by the community health center.