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*John Clymer:* Our next panel focuses on reducing the mental health crisis and leading causes of death together. Common mental health disorders are linked to a higher risk of heart attack and stroke and heart conditions increase the chances of mental health issues. This session will address the mental and cardiovascular health connection and how we can simultaneously improve mental and cardiometabolic health. We will begin with a conversation between Dr. Ileana Pina, Professor and Quality Officer in the Heart and Vascular Service Line at Thomas Jefferson University and a National Forum board member, and Captain Christopher Jones, Director of the Center for Substance Abuse Prevention at the Substance Abuse and Mental Health Services Administration. I'll follow Drs. Pina and Jones with an interview with the mayor of West Sacramento, California, Martha Guerrero. Now Dr. Pina and Dr. Jones.

*Ileana Pina:* Hello, everyone. In this session, we will examine the connection between mental health and cardiovascular health, which is thought to be by going back and forth between the two and it is widely acknowledged that common mental health disorders are very tightened to the risk of heart attacks and strokes. I see it in the patients all the time. Experts in cardiac psychiatry believe that this is a bidirectional suggestion or bidirectional association.

Poor mental health, which again, I see every day, can exacerbate heart health issues. On the other hand, cardiovascular conditions can elevate the likelihood of mental health. So, Dr. Jones, welcome to be here with me. As an expert, you have extensive experience in the public health world and substance abuse and prevention, which will provide us with very valuable perspectives for our conversation. Can you tell me a little bit about what you do in your service?

*Christopher Jones:* Sure. Thank you so much for the opportunity to be here today. Currently I serve as the Director of the Center for Substance Abuse Prevention at SAMHSA, which really focuses on the upstream aspects of substance use, mental health promotion really thinking about how we look at these factors that play out early in life that contribute to risk for substance use or mental health and ultimately even risk for chronic diseases like cardiovascular disease later in life. And try to work with communities, policy makers, researchers, coalitions to take a wide perspective of prevention and think about what can we do at an individual level, at the family and relationship level, at the community level, at the societal level to implement prevention strategies that can have these broad payoffs for public health.

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Prior to my role at SAMHSA, I was the Director of the Injury Center at CDC, which also focuses on many of these similar issues and the connection between those early life experiences and later health risk behaviors and chronic disease as well.

*Ileana Pina:* So how early in life? You said early in life. Do you think this starts in the teen-age years where post puberty? When does it start?

*Christopher Jones:* I actually think it starts even further upstream. So if we look at the research around exposure to trauma or adverse childhood experiences, which started in the chronic disease area at CDC basically asking adults, "What was your early life like that might be a predictor to your current health state?" What you find is that people who experience things like physical or emotional abuse or neglect, sexual abuse, or were raised in a household that had mental health or substance use challenges, divorce, incarceration of a parent, really things that can introduce instability or insecurity in a child's life early on is a strong predictor for future health risk behaviors.

There's a logical connection between those early years in life where you're making important neural connections around emotional regulation, how you respond to stress, and being able to evaluate benefits and risks that we know those early years are so important in the developmental process that you can see when people have experienced trauma early on they tend to have an overriding stress or toxic stress response, which then can lead to early adoption of health risk behaviors, things like smoking, alcohol use, which then accumulate over time and then certainly have implications for chronic disease like heart disease or diabetes.

As you mentioned at the top, there is a bidirectional or multidirectional relationship between substance use, health risk behaviors, mental health, and chronic disease. So from my perspective, we have to start long before middle or high school which is when some of the risk behaviors might start to emerge, but we really miss prevention opportunities if we don't start earlier in life.

*Ileana Pina:* So I like your points. As a cardiologist, I see people who already have cardiovascular disease. We do take a history and the history for the family is usually, "Anyone in your family have heart disease? Did anybody die suddenly? Is there a high blood pressure history in your family?" And we ask all these things, but as you're pointing out the earlier life experiences, whatever they happen to be, will also, I think, reduce the health care importance to that individual. They will not pay as much attention to symptoms. They may not get their blood pressure ever checked or hear from other

people, "Your blood pressure is fine. Don't worry about it." So their queues are coming from a lot of places and we do talk a lot about health literacy.

So I think that health literacy is formed in the home, usually from your parents who may in fact go get their flu shots and they get their blood tests and they get their annual physicals. To the children who never see that again if the parents are doing it, but they're not getting it done. There's a bad link here. Then take the opposite. I just gave a talk recently that I said I always give bad news or I often give bad news. My bad news are, "You have heart failure." That's a pretty bad thing to hear. We know that there's a link between heart failure and depression, that about more than a third of heart failure patients are actually clinically depressed.

One of our barriers is that they give us 20 minutes to see a follow-up. How the heck can you ever get that history in a 20 minute follow-up? I'm not a psychiatrist. I'm not in the mental health field. How can I get them to the right person to talk to them and get maybe a deeper history of that link that you were talking about really early on? And I think those are barriers within our health system. My third concern is that some of the drugs that I use for the heart failure, for example, may interact with an antidepressant or an anti-anxiety.

We've written papers about this and I can refer the audience to a paper in the *Journal of the American College of Cardiology* where I'm the first author where we did talk about this, about the medication interactions that people – and you're a pharmacist – that people need to be careful about. How do you assess that between the heart drugs and the medications that may be given for all kinds of mental health disorders?

*Christopher Jones:* Yeah. It certainly is a complicated situation and I think it's emblematic of a very fragmented health care system. We have mental health treatment. We have substance use treatment. We have physical health care. Often times those are not integrated, that people are piecemealing their care together. So care teams don't even have the opportunity to strategize about what are the options, what are the therapeutic options that might be able to treat underlying heart failure or cardiovascular condition that might be a better option for somebody who is on an antipsychotic or an antidepressant or some multiple medications for mental health conditions in addition to other risk behaviors that they might be engaging in.

So I think it does underscore the need for trying to integrate physical health care with behavioral health. That's certainly an area

at SAMHSA that we have been particularly interested in in trying to provide funding and work with CMS and others across federal health agencies to enable that. In some cases that's physical colocation of services and others it's thinking about systems and IT systems, how can they work together. So you, as a cardiologist, if you have high prevalence of depression among your patients, you've got that connection.

Maybe they're not right in your office, but you know who you can refer out to get those additional psychological psychosocial services or a consult for medications. What is the right mix? Or even if things do have significant adverse – potential adverse reactions, we can monitor for that. We can have a care plan in place for the patient to meet their therapeutic goals both on the health – heart health side, but also on the mental health or substance use side.

*Ileana Pina:*

I'll give you a couple of examples. When I was at the Honnamana Hospital here in Philadelphia in the late '80s, I actually had interns from psychology who were rotating with us both for the exercise team, which we'll talk about in a few minutes, and for the heart failure team. They were highly, highly invaluable because they interacted with the families too because a lot of this is a family affair. It's not just a patient, but whoever is around them that can contribute to the mental health issues or alleviate them, one or the other. So we had that there.

Then in Case Western in Cleveland, I actually had one of these individuals in my office clinic with a room of her own. She was also dynamite and fantastic. When we identified some issues with a patient, we would send them to her. It just really, really worked well. Here at Jefferson, we don't have a mental health person embedded into the team, but you're right. We have the department of psychiatry, the department of psychology. I'll give you another perfect example. I have a gentleman who really sick. He came in shockingly with heart failure, had had sudden death. He was a bear to deal with. He was angry. He was upset, a man who had been very strong and he worked for security station. "What? Me? I'm gonna get sick like this? Impossible."

He was lashing out, really lashing out at everybody, and preventing us from evaluating him for advanced therapies in the future once we could get his heart failure controlled. We did send him to one of our local psychologists or psychiatrists. I don't remember which. He got put on an anti-anxiety drug and we had one of our pharmacists take a look at the combination to see if there was any interaction and he is like a changed man. He's listening to us. He's following what we've asked him to do. Now we're hoping we can

transplant him. So we've come a long way. It's taken us almost a year to get here, but there is a perfect example.

And more recently, I now have pharmacists. I happen to really love the role of pharmacists in our clinics, and I now have two or three pharmacists, young women who are rotating with us, but they're coming back to our post-discharge clinic. I can tell you already they're making an impact because when I leave the room, I let them talk directly to the patient. They're looking for those drug interactions and they'll say to me, "You can't start this. You can't start that."

So I really urge anyone who's listening to this to think within your own system of care, who do you have that you can go to for this? So let me ask you if you had to give an anti-depressive drug, let's say, 'cause I see more depression than anything else. Is there a type of drug that you think would have less interaction with our medications?

*Christopher Jones:* I think it really just depends. SSRIs, SNRIs, and SSRI combination products are often the go to for depression and even though they have similar mechanisms of action, those individual drugs within that class have different effects on metabolism for certain medications. So there really is a need to not take a one-size-fits-all approach. You may know therapeutic class, but it does come down to what particular combination of medication somebody might be getting.

Do they also have co-occurring type two diabetes and what medications they're getting for that? If you're dealing with medications that are certainly impacting heart function, regulating rhythms, those types of things, we obviously want to be very careful about anything that might either decrease or increase the therapeutic amount of those drugs.

*Ileana Pina:* You mean like QT interval prolongation?

*Christopher Jones:* Right. So if you get a supra-therapeutic dose because of slowed metabolism due to an antidepressant, that can have substantial consequences, but similarly, if the metabolism of cardiovascular meds gets sped up because of psychiatric medications then you're not getting enough of a therapeutic dose. So really can work both ways. So I would underscore your experience in your current clinic of having those pharmacists on hand. Even if they're not rotating on your service in a system, there are pharmacists there who can be brought in to consult on those issues.

I would just also underscore what you mentioned a moment ago about engaging with a family and thinking about even outside of medications, what other therapeutic modalities can be beneficial in looking at things like exercise, even family engagement, and connection. People, when they're very sick, they're in and out of the hospital, the doctor's office. It's really easy to feel isolated in that you can't engage in the things that you used to enjoy engaging in. So really taking that as an important part of the therapeutic approach to address those issues is particularly important as well. I think allows us to think holistically from the patient's perspective.

I loved your example of the individual who came in who was hyped up and frustrated and angry and got on an antidepressant. In some cases, past exposure to trauma or ACES may present in that way or you may have some barriers to engaging optimally in a therapeutic plan with a patient and you have to take trauma informed approaches to care. There is a whole movement to really think about not just in mental health or substance use, but in health care generally how do we really take into account prior trauma as part of the therapeutic approach.

There are psychosocial treatments like trauma-focused cognitive behavior therapy that can be really helpful for individuals to address their past trauma. That trauma may also be getting in the way of you engaging and optimally improving their heart health as well. So really it's looking at the person in a whole from psychosocial, substance use, and medical to address all the issues that may be contributing to the challenges they're facing.

*Ileana Pina:*

So for my colleagues who perhaps are not – or they're running, we're busy. We get told you have to see more and more patients to meet your RVUs, et cetera. Do we have any short questionnaires? We will be using very soon the Kansas City Cardiomyopathy Questionnaire for health status. That touches on the quality of life because one of the questions has to do with quality of life, but it really doesn't touch on mental health. Is there a questionnaire or something easy that we could give the patients when they're sitting there in the waiting room complaining that we're running late that they could fill out that would – if you look at it you say, "I got to pay attention to this because there's something going on"? Is there such a thing?

*Christopher Jones:*

Yeah. So there are short screeners that can be used for depression or anxiety. There are one or two question screeners that can be used to identify potential substance use challenges that could be integrated into the patient intake when they're filling out what medications do you take, has anything changed in your history, a series of five to nine questions on some of those. Some are shorter

than others. So there are resources that are available that could at least flag for the clinician to just maybe have the conversation. I think what we see generally from the research is that it's relatively rare for clinicians to even have the discussion or raise the question about mental health challenges or substance use.

Often that's because there are many competing priorities. You have a limited amount of time, but also some of it is that clinicians who are not trained in those areas don't feel comfortable engaging in those discussions because they're not sure what to do with the patient. Again, I think this gets to how we think about mental health and substance use training in health professional programs. How do we create electronic health records, screeners, but also prompts for clinicians and then think about those connections within the system? If somebody comes up positive, it's not that you got to address all of that right then and there, but then you have a system in place in which to refer them or connect them to care that can address those particular issues.

*Ileana Pina:*

What troubles me is that if we don't identify some of these issues, the patient is not taking the medicines. I hear it immediately when I see that they say, "Oh, I don't need refills." "I don't need refills" probably means that they still have drugs because they haven't been taking it. I think COVID was a wonderful example. During COVID, I don't know if you're aware of this, the heart failure hospitalizations dropped. I mean dropped like a rocket. We were all saying, "Oh my God. They're probably at home getting sicker." Well, they weren't. When they would come in they would come in at the same sickness level as they did before.

What I think was happening is that they were taking their medicines for a change. The medicines do work with the heart disease. They do work. They weren't eating out junk food every day. So their diet was probably healthier and thirdly, they probably had someone in their immediate caregiver team, their parent, their brother, their sister, even a friend who was hovering over them so they wouldn't come into a hospital 'cause everybody was terrified to come to the hospital and a catch COVID from somebody else. So we saw this phenomenon. As the pandemic subsided, hospitalization started going up again. We even have data on pressures that were better. Even when you weren't doing anything they were better. To me, it means they were taking their meds.

I'm gonna hunt around to see if I find any of those. You may wanna provide to our national quality group here any suggestions for these questionnaires. We're trying to do the same thing for things like sleep apnea. There's another one. The sleep apnea can affect the mental health as well because patients aren't sleeping. So

even identifying that we have some questionnaires to figure that out. What do you think we can do? You were also in service of your country. I work for the FDA as well. What can we do nationally to say to the public, "We have a crisis. This is really bidirectional. If we don't attack this, the cardiovascular disease is not going to get better. Our medications are getting more complicated and the patient's diseases themselves are getting more complex." How can we do this?

*Christopher Jones:* I think that we are really at such a critical point in time. If you look at mental health indicators in the US, those have been going in the wrong direction particularly among young people over the last decade. Data from CDC's youth risk behavior survey shows 42 percent of high school students felt persistently sad or hopeless. Twenty percent thought about suicide in the past year. One in ten attempted suicide. You see 110,000 overdose deaths in the past year. We see higher rates of substance use among people who have mental health conditions. Then this connection to chronic disease as well.

I think it's really a time for us within the health care sphere, within the government sphere, and then policy makers to come together first to underscore that these are not disconnected issues, that they are reflective of broader trends that are happening and playing out in communities and that there really is a role for all of us to play in addressing these issues whether you're a family member, a care giver, a health care provider, providing social services, working in other sectors, education, criminal justice. We need to be working together, talking together about what are those shared risk and protective factors starting early in life, thinking about how are we supporting families and young kids. How are we creating opportunities in communities for jobs, for education to lift people out of poverty? How do we think about social determinants, housing, transportation?

These are all very much connected to chronic disease, but also to mental health and substance use. So I think we use the concern about these issues and just the tremendous impact to health and economic costs to say what we've been doing hasn't been working. We need to look at this in a more holistic way working together across sectors that there are no simple solutions. These are complex issues. If we're all pulling our various levers together we really do have an opportunity to make an impact and we can't start when the problems are diagnosed.

That is part of it, but we've got to start long before we get to that point. We can get ahead of these challenges. We did an analysis a couple of years ago at the CDC that was basically asking the question if we could prevent ACES what would the potential



public health impacts be? We could see a 33 percent drop in smoking and, a 25 percent drop in alcohol use, but also significant declines in cardiovascular disease, respiratory disease, cancer, and other leading causes of death. So there really is an opportunity to get ahead of the challenges that we're facing while also addressing the challenges that exist in the community. It will take all of us working together.

*Ileana Pina:*

Yeah. If you turn this around you can say that healthy living starting early will really prevent a lot of this because the patients may feel better. I can tell you from the cardiovascular side of things, that if people would only take their blood pressure medicines, we could reduce what I do in heart failure by 50 percent. It's not trivial because with hypertension, especially in some of these underrepresented minority communities, what we see is stroke. We see strokes more than heart attacks. We see strokes and of course heart failure and when the heart is failing, the kidneys are gone. So many of these patients have to go into dialysis. That can be a very depressing point in their life when they have to sit in a chair for four hours three times a week to take over their kidney function.

So I try to make sure that I explain to the patients what things you're going to be preventing by just simply taking your medications and lowering their blood pressure. At this point, it doesn't even matter which drug as long as that blood pressure does come down. So to me, there's a direct link. One other interesting link and our subsequent panel here will be talking about physical activity in the community. So we did a 2,231 person trial, an NIH trial of exercise in heart failure. We randomized the patients either to stay active, stay moving, et cetera, or coming actually to a cardiac rehab program and doing the exercise. The adherence was terrible.

We didn't meet our primary endpoint as we wanted it because we lost adherence even very early. This was free to them. We had set up satellites so they wouldn't have to drive downtown. Most patients hate driving downtown and having to park. That's always a big barrier. So we made it easier for them to have centers near home. Then we gave them a piece of equipment in the home to use and to keep. We had a bicycle or a treadmill. Even there the adherence was not great at all, not great. It was pretty bad. It may have ended up giving us a lesser result in the trial, which we were hoping that we would have.

However, we did do the Beck depression inventory on everybody. We found that there was quite a high percentage of patients whose scores were over 14. Then at the end of the study – now remember

we have a control group and we have an intervention group. Regardless, as long as that Beck depression inventory was high and they weren't exercising, their outcomes were worse. So if they were being – if they were exercising with a higher Beck or a lower Beck, they did better. So to us, there's a direct link between physical activity in the case of a group that had an injection fraction of 25. These were real low ejection fraction patients in a very large number. It worked. It worked.

So we have data on that and we have papers on that because we felt that that was just a beautiful link between the two. I fear that my colleagues maybe who are not doing heart failure, who are doing more generally cardiology or even interventions, being told that you need a new heart is pretty scary. Our transplant group does have a social worker who deals a lot with the mental health issues of the patients. The average cardiologist doesn't have that unless you set it up that way. I think that that recognition by our bigger systems of care about what you just stated, the need to focus and examine what else is going on on these patients in their lives that has brought them here and may allow them not to do well.

So I am very worried about these people and part of what that talk that I gave was what can we trust that the patient's believe us because in the model of change if they don't believe you, they're not gonna do anything. So how can we try to prevent anxiety, for me as a cardiologist for patients who I haven't seen, the general population that we're trying to prevent. Now we have all these cardiometabolic like diabetes. I don't have to tell you. You probably see a lot of that in your area. How can we go, like you were saying, up beyond, earlier? How can we do that?

*Christopher Jones:* Yeah. So this is the sweet spot for prevention is really thinking about how are we helping to ensure a strong start for families and kids and how are we looking at this from a life course perspective, from a developmental perspective. So again, there are very early programs like home visitation programs, nurse family partnerships is an example that are helping expecting parents get ready. They do follow-up with kids through the age of two years old or so where they're looking at what social services, what medical services. So again, they're helping to have that strong start.

Then as you're thinking about even before kids start school do they have opportunities for learning? How are we supporting families? How are we looking at making ends meet within homes? What are those stressors that are contributing? Whether it's stressors that are contributing to health risk behaviors for parents or that are influencing the developmental trajectories of those kids. There is an opportunity to get ahead of it and then as kids get into school,

think about how we support them to develop healthy relationships to help with problem-solving and conflict resolution. I think to me, healthy eating, exercise, having those connections, healthy connections to parents, to other nonparental adult role models, and their peers.

While it doesn't – maybe it's not intuitive that this somehow improves cardiovascular health late in life, there is science there that does show that if we can do those things and we can prevent initiation of risk behaviors like smoking or alcohol use or substance use, that if we can instill healthy relationships, resilience, kids have less risk for mental health conditions later on in adolescents, young adults later on in life. You can see how both mental health and substance use can have these cascading effects too chronic disease later on.

So I think it's helping to make those connections more tangible and real for people of how do you get from what happens early in life to these later stage consequences, which you're seeing in your clinic, but that there is science that lays out policies, programs, practices that can be put in place in communities to address those issues to really help improve the overall health of communities. I think we haven't made commiserate investments in those types of activities as we do in the healthcare system in treating the problems once they have developed. So, I think we have to find a better balance in investing in those upstream prevention interventions that can have these long-term payoffs and save dollars later on down the road.

*Ileana Pina:*

It would save us a lot of money down the road if we were able to attack these issues early. I'm gonna refocus just on women and pregnancy. It is a message that there are some trials ongoing now about getting the message to women who are planning to get pregnant or are already pregnant that what happens to them during pregnancy as far as cardiovascular like hypertension or diabetes during pregnancy is going to impact them earlier in life than say their grandmother who never had those. They're gonna be impacted perhaps in their 40s and their early 50s, not in their 60s and 70s when you see it more often.

So the health and the health of the fetus are equally important to your health and taking your medications and taking care of you. Another big point in women is obesity in the African American population, which is also associated with all these other disorders. But if you go back – that's a question that I ask two or three of my patients this week. When did you start having – 'cause rather than using the word obesity – when did you start having weight issues? They understand that when I say weight issues 'cause it's not

judgmental. You'll hear that it starts really early back in their teenage years when eating was no longer healthy.

So getting to that early group is so important. I think it involves the schools and of course, it involves the parents in the home teaching the children. When you see families who are obese, usually everybody is obese in the family. So I always say that women can control the food intake in the family and they have it in their hands to improve that. So with the American Heart Association, we focus a lot on Go Red for Women and what can we do as women to improve our health for the lifetime, not just at one point. By the time I see them, they're way, way gone, and much tougher to identify. Do you have women in your practices there?

*Christopher Jones:* So at SAMHSA we obviously are dealing with a variety of communities. So one of the areas that we have tried to focus on is equity and disparities that exist. I think you would see strong correlation with communities that are disproportionately impacted by substance use or mental health challenges that also have chronic challenges. I think to your point on nutrition that there is sort of individual agency there. I would also say that there are structural factors that contribute.

So if you live in a community where there has been a substantial amount of disinvestment and all you have is fast food restaurants and you don't have access to affordable, healthy options, it's not surprising that the behaviors would be what you can afford. I think that really looking at economic structural factors is another key upstream part of this. Same with exercise. If you don't feel safe going out in your community or your community doesn't have places to go exercise, it becomes a challenge.

If you fear being shot walking down the street, regardless of what age you are, you are likely not to engage in that behavior. If you don't have green spaces or basketball courts or soccer fields in your community or sidewalks in your community that can have really important impacts on mental health, on risk for substance use, on chronic disease. So I think in addition to the individual, we have to look at the structural factors as well.

*Ileana Pina:* You may not be surprised that where I have been both in New York and in Philadelphia, I have some women patients in particular who when I tell them, "I need you to walk 45 minutes a day, I don't care where you do it," they'll say to me, "I really don't have" – like you just said – "I really don't have a place." So what I've done with them is if I find out how they live, in other words, do they have a one-bedroom apartment or do they have a little house, do they have stairs? Even if they have three or four steps,

going up and down those steps repeatedly or walking around inside their house.

In New York where these big buildings are there, these concrete jungles, there's hallways. So if they feel safe at least in that hallway you can use the hallway. So we need to become very inventive in what we do, but I think it's an issue for all of us. Hopefully, in the next segment, we're going to hear more about how can a community improve these things. You talked about what I call food deserts where you can actually map out where the food deserts are there's more hypertension. There's more diabetes simply because there is no access. So we're gonna be hearing about physical activity and all these social connections in the community that can maybe prevent anxiety, stress, and depression and make people healthier in their hearts.

So I'm gonna close now and I wanna thank you, Captain, for giving us your incredible experience. You've been doing this for a while. It's been really an honor to sit here with you. For our audience, I think we aim not only to understand this very intricate connection between heart health and mental health and it didn't just start the day I saw the patient. It started way back. To try to identify tangible solutions, which is gonna take a village. This is something I can't do by myself.

I have to involve my system and give them that sense that, "Hey, this is important. We can't keep ignoring it," and maybe make this a healthier and more equitable future for all. I also think that sometimes social media is very much in the way of disinformation instead of good information, which is what it was I think originally meant to be. So Dr. Jones, thank you again for being with me and hopefully, we'll nab you again for another National Forum meeting. Have a great day, everyone. Thanks for being here.

*Christopher Jones:* Thank you so much. Thank you.

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