

*John Clymer:* Thank you, Hilary and Dr. Jones. It is good to know we're making progress, and what actions National Forum members and stakeholders can take to increase use of SMBP. Pregnancy is a time when women face additional risk of developing hypertension. It also is an opportunity to help them prevent and manage hypertension. Here to talk about improving women's blood pressure control before, during, and after pregnancy are Hilary Wall. And Larry Fine. Dr. Fine is senior advisor at the Clinical Applications and Prevention Branch in the Division of Cardiovascular Sciences at the National Heart, Lung, and Blood Institute. Dr. Fine?

*Larry Fine:* Good afternoon. Hilary, I would like to ask you some questions about a recent article that you wrote. And so I'm going to, with your permission, I'm going to go ahead and ask you those questions.

*Hilary Wall:* That'd be great. Thanks, Larry.

*Larry Fine:* Okay. So why did you write your recent article publication called "An Opportunity to Better Address Hypertension in Women: Self-Measured Blood Pressure Monitoring," in the *Journal of Women*?

*Hilary Wall:* Yeah, so, as you likely know, the prevalence of hypertensive disorders of pregnancy is on the rise, which puts more women at risk for adverse pregnancy-related outcomes, and atherosclerotic cardiovascular disease later in life. Self-measured blood pressure monitoring, or SMBP, as we love to call it, is one tool that we think can be better utilized in pregnant and postpartum people, and throughout their life course. So we wanted to summarize some of the challenges and opportunities that, we, as a nation, have in this space.

*Larry Fine:* Thank you. Before we get to self-measurement of blood pressure with a home device, I thought you might give us a little bit more background information. So could you expand a little bit about what we know about hypertension in women of reproductive age?

*Hilary Wall:* Sure. You know, it's hard to believe that there are more than 56 million women in the United States, who have hypertension, including almost one in five women of reproductive age. It's a little bit over 19 percent of women ages 20 to 44, who have hypertension. And hypertension prevalence in women of reproductive age varies widely by race and ethnicity, increasing to over 30 percent among non-Hispanic Black women. And some of these women of reproductive age may choose to become pregnant.

So attending to their hypertension, before they do, is of utmost importance.

*Larry Fine:* Thank you. And can you tell us a little bit about how hypertension in pregnancy what it causes? What disorders does it cause?

*Hilary Wall:* Yeah, so “hypertensive disorders of pregnancy” is a broad phrase that we all use to cover a spectrum of conditions that are a leading cause of maternal mortality, and have been increasing in prevalence for several decades now. And they include, we’ve got chronic hypertension, which is high blood pressure, before pregnancy or diagnosed before 20 weeks of pregnancy. We’ve got gestational hypertension, which is high blood pressure diagnosed after 20 weeks of pregnancy. And then there are also more severe conditions of preeclampsia, eclampsia, and a condition called “help syndrome”, which can cause serious outcomes in pregnant people who develop them.

*Larry Fine:* Thank you. Can you please address potential strategies for dealing with hypertension and women focusing on pregnancy issues, such as self-measured blood pressure monitoring?

*Hilary Wall:* Sure. So SMBP is a favorite topic of mine. And as you know, Larry, in the general population of people with hypertension, SMBP is an evidence-based strategy for lowering blood pressure and improving control. But there are fewer studies in using SMBP in pregnant and postpartum populations. However, we do believe that it can be used to provide additional sort of surveillance information to both the clinician and the patient. And this may be particularly true and important for prenatal care, when it comes to women who have barriers, such as limited access to healthcare and transportation, women who have copayment issues, or women who have the inability to take time off from work.

So SMBP can help fill gaps when in-person visits aren’t necessarily possible. Now, that being said, there are special concerns when it comes to pregnant people in SMBP, like making sure we’re using SMBP devices that have been validated specifically in pregnant populations. Those can be a little challenging to come by, but we can point folks in the right direction there. And coverage continues to be a challenge for SMBP devices in general.

In 2020, I believe, Medicaid was the source of payment for about 42 percent of births, including 65 percent of births by non-Hispanic Black women, and almost 60 percent of births by

Hispanic women. And as of February of last year, only 37 states provided some level of Medicaid coverage for SMBP devices, although the range and level of coverage varies greatly, and just in general, could be improved upon. So there's a number of challenges when it comes to SMBP in pregnancy and postpartum.

*Larry Fine:*

You know, when I think of the self-measurement of blood pressure, I think it can have two critical uses, which I want you to see – I want you to comment on, see if this is true during pregnancy. So the first one is it really confirms the diagnosis. Because sometimes your blood pressure is higher when it's measured in the doctor's office. And that's in part sometimes, because, unfortunately, not all parts of our healthcare system measure blood pressure, as we would like it measured.

So when you do it inaccurately, of course, you generally get a higher reading. So if your blood pressure is measured in a medical office, and then at home, you can see whether you're high in both places. So that's sort of confirming the diagnosis. Is that something that that's useful in pregnancy?

*Hilary Wall:*

I think that it can be for sure. I think, again, there's less studies that have been formally done in this space. But, absolutely, White coat hypertension is a real issue for many people. And so using SMBP, when pregnant people are home, when they're comfortable, when they haven't been running to get to their doctor's appointment, I think that's a great way to really confirm whether or not that person has hypertension. So you're absolutely right.

And then the other indication would be if there are medication changes, whether a new medication is added to the antihypertensive regimen or an up titration. You know, that's when we'd like the patient to go home, check their blood pressure, get those values back to their clinician, and maybe some more tweaking of the medication regimen can occur based on those SMBP readings.

*Larry Fine:*

Yes, I agree with you. The second use of self-measured blood pressure is really tracking, as you say, if you change your diet, or you change your medication, or you just haven't done either, but you want to see how well those things are working in lowering your blood pressure, then the ability to get measurements, several measurements, you know, in the morning, and in the evening, maybe three or four times a week, for at least the first week or so, to see how things are working. I think that's a real strength of self-measurement of blood pressure at home. Do you agree?

*Hilary Wall:* Absolutely. I do agree. And, you know, the typical protocol, as you said, is sort of take two readings in the morning, two readings in the evening. We'd like to see it over seven days, but we'll take it for as few as three days. And then we average those up. And that gives clinicians and patients a nice representative blood pressure reading. And so, absolutely, I think patients, when they're at home, they can be seeing the real impact of taking a walk around the block. What does that do to their blood pressure? What does avoiding caffeine in the morning do to their blood pressure? I totally agree with you.

*Larry Fine:* Thank you very much. And, you know, another question I've thought of is, oh, how can care teams better detect women with hypertensive disorders in pregnancy, and postpartum, and maybe preeclampsia, using a self-measurement of blood pressure devices?

*Hilary Wall:* Yeah, I think care teams are so critical in identifying people with hypertensive disorders of pregnancy. There's some published literature that shows that there are pregnant people, who are what we call "hiding in plain sight", who have multiple elevated blood pressure readings, but haven't been diagnosed or given antihypertensive treatment. So I think there's a real role for everyone in the care team, and that's people who are physically in the prenatal visit, or involved in the prenatal visit, but this is also family members, doulas, lactation consultants, and the patient themselves. We need all of those folks to understand that high blood pressure needs to be addressed. And self-measured blood pressure monitoring is one tool that can help us be aware of whether or not the patient is experiencing that.

*Larry Fine:* Thank you. So another issue is, can these measurements be used in leveraging clinical quantity quality measures?

*Hilary Wall:* Yeah, so it's a great question, and one that we could probably spend three hours discussing. Right now, Million Hearts, CDC, the Centers for Medicare and Medicaid Services, we use a clinical quality measure to assess blood pressure control that goes by CMS-165, or NQF-18, all these different numbers. But, essentially, it looks at, you know, is a patient's blood pressure under a certain threshold. The problem with that measure is that it excludes pregnant populations, right? Like, take them out of your denominator. So we can't, that measure doesn't assess blood pressure control in pregnant populations.

But the measure, itself, does allow for a clinician to use SMBP values, as part of reporting on the measure. There could be some

refinements there, but, in general, we're at least headed in the right direction. But there's still a measurement gap here in that, so we have blood pressure control in the general hypertensive population. And then there's a measure that goes by the number CMS-22. This is screening for high blood pressure, and follow-up documented. So has the person been screened for high blood pressure? And if their value is elevated, was there something noted in the care plan. That measure includes pregnant people, but it stops short of looking at blood pressure control.

So there's that gap, right. We assess hypertension. We look at for control in nonpregnant populations, but where's the control among pregnant populations? So I think that the field may benefit by closing this measurement gap, and developing that clinical quality measure that can really look at blood pressure control in pregnant populations. And, of course, including SMBP readings as part of that assessment of blood pressure control.

*Larry Fine:* So is there anything else you would like to share with us or share with The National Forum members?

*Hilary Wall:* Well, you know, the thing that I love about the National Forum is it's comprised of so many diverse members who are all so passionate about blood pressure control. And so I guess I just have a plea for all of the members, that when we all, myself included, focus our efforts on blood pressure control, that we don't forget about pregnant and postpartum populations with hypertension. Because there's a real opportunity for intervention in this group, especially through self-measured blood pressure monitoring.

And by focusing on blood pressure control in people with hypertensive disorders of pregnancy, we can potentially avert serious maternal outcomes, and subsequently, offspring outcomes. So, you know, there's, there's a lot of room to do a lot of good in the space. We just need to make sure when we're focused on blood pressure control, that we're including this population.

*Larry Fine:* Thank you. So I think you've said a number of very important things. Self-measuring of blood pressure at home allows you to confirm the diagnosis of hypertension, allows you to track how the treatment, whether that be diet, other lifestyle, or medications, how you're doing. It can be very valuable to the care team, all members of the care team.

*Hilary Wall:* Absolutely.

*Larry Fine:* And then finally, you left us with a challenge. The challenges can we eventually really get self-measured blood pressure into our clinical quality measures. And in fact, develop clinical quality measures for pregnant women, not just for those after pregnancy and before pregnancy. So I wonder if there's anything else you would like to say in closing?

*Hilary Wall:* Just I think, you know, self-measured blood pressure monitoring is one tool in a big toolbox, but I think it's one that warrants our collective attention. And I think many of the organizations that are working on SMBP implementation nationally can help with looking at SMBP in pregnant populations as well. I think there's barriers there that are unique to that population that we can collectively address.

*Larry Fine:* Thank you very much.

*Hilary Wall:* Thank you.

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