

**BREAK THIS PRACTICE HABIT**

# The in-person postpartum blood pressure check: For whose benefit?

While society guidelines continue to recommend the in-person postpartum blood pressure check, this practice is often both unachievable and insufficient for providing the best care for women at risk for adverse outcomes in the postpartum period

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**CASE Patient questions need for postpartum BP check**

Ms. P presents at 28 weeks' gestation with superimposed preeclampsia. She receives antenatal corticosteroids and titration of her nifedipine, but she is delivered at 29 weeks because of worsening fetal status. Her physician recommends a blood pressure (BP) visit in the office at 7 days postpartum.

She asks, "But can't I just call you with the BP reading? And what do I do in the meantime?"

**H**ypertensive disorders of pregnancy and chronic hypertension remain among the leading causes of maternal morbidity and mortality in the United States



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and worldwide.<sup>1</sup> The postpartum period remains a particularly high-risk time since up to 40% of maternal mortality can occur after delivery. To that end, the 2013 American College of Obstetricians and Gynecologists Hypertension in Pregnancy Task Force recommends postpartum follow-up 7 to 10 days after delivery in women with a hypertensive disorder of pregnancy.<sup>2</sup>

**Why we need to find an alternative approach**

Unfortunately, these guidelines are both cumbersome and insufficient. Up to one-third of patients do not attend their postpartum visit, particularly those who are young, uninsured, and nonwhite, a list uncomfortably similar to that for women most at risk for adverse outcomes after a high-risk pregnancy. In addition, the 7- to 10-day visit still represents only a single snapshot of the patient's BP values rather than an ongoing assessment of symptoms or BP elevation over time. Moreover, studies also have shown that BP in both normotensive and hypertensive women often rises by the fifth day postpartum, suggesting that leaving this large window of time without surveillance may miss an opportunity to detect elevated BP in a more timely manner.<sup>3</sup>

It is time to break the habit of the in-office postpartum BP check and to evaluate the patient where she is and when she needs it. Research in the last 2 years shows that there are several solutions to our case patient's question.

### **Solution 1: The provider-driven system**

*"Of course. Text us your numbers, and you will hear from the doctor if you need to do anything differently."*

One method that addresses both the communication and safety issues inherent in the 7- to 10-day routine in-office BP check is to have the patient send in her BP measurements for direct clinician review.

Researchers at the University of Pennsylvania developed a robust program using their Way to Health platform.<sup>4</sup> Participating patients text their BP values twice daily, and they receive automated feedback for all values, with additional human feedback in real time from a clinician for severe-range values (>160 mm Hg systolic or >110 mm Hg diastolic). As an added safety measure, a physician reviews all inputted BPs daily and assesses the need for antihypertensive medication for BPs in the high mild range. Using this protocol, the researchers achieved a significant increase in adherence with the recommendation for reporting a BP value in the first 10 days after discharge (from 44% to 92%) as well as having fewer readmissions in the text-messaging arm (4% vs 0%).

Perhaps most impressive, though, is that the technology use eliminated pre-existing racial disparities in adherence. Black participants were as likely as nonblack participants to report a postpartum BP in the text-messaging system (93% vs 91%) despite being less than half as likely to keep a BP check visit (33% vs 70%).<sup>5</sup>

A similar solution is in place at the University of Pittsburgh, where a text message system on the Vivify platform is used to deliver patient BP measurements to a centralized monitoring team.<sup>6</sup> This program is unique in that, rather than relying on a single physician,



it is run through a nurse "call center" that allowed them to expand to 3 hospitals with the use of a single centralized monitoring team. To date, the program has enrolled more than 2,000 patients and achieved patient satisfaction rates greater than 94%.

A final program to consider was developed and piloted at the University of Wisconsin with an added technological advance: the use of a Bluetooth-enabled BP cuff that permits values to be automatically transmitted to a tablet that then uploads the information to a centralized database.<sup>7</sup> This database was in turn monitored by trained nurses for safety and initiation or titration of antihypertensive medication as needed. Similar to the experience at the University of Pennsylvania, the researchers found improved adherence with monitoring and a notable reduction in readmissions (3.7% in controls vs 0.5% in the intervention arm). Of note, among those who did receive the ongoing monitoring, severe hypertension occurred in 56 (26.2%) of those patients and did so a mean of 6 days after discharge (that is, *prior* to when they typically would have seen a provider.)

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patient's ongoing clinical course rather than a single snapshot of her BP in an artificial environment (and often after the highest risk time period!). In addition, direct monitoring by clinicians ensures an optimal safety profile.

Such systems, however, are also extremely resource intense in terms of both upfront information technology investment and ongoing provider surveillance. The systems above also relied on giving the patients a BP cuff, so it is unclear whether it was the technology support or this simple intervention that yielded the benefits. Nonetheless, the benefits were undeniable, and the financial costs saved by reducing even 1 hospital admission as well as the costs of outpatient surveillance may in the end justify these upfront expenditures.

### **Solution 2: The algorithm-driven system**

*"Sure. Plug your numbers into our system, and you'll receive an automated response as to what to do next."*

One way to alleviate both the financial and opportunity cost of constant clinician surveillance would be to offload some tasks to algorithmic support. This approach—home BP monitoring accompanied by self-titration of antihypertensive medication—has been validated in outpatient primary care hypertension management in nonpregnant adults and more recently for postpartum patients as well.

In the SNAP-HT trial, investigators randomly assigned women to either usual care or algorithm-driven outpatient BP management.<sup>8</sup> While both groups had serial visits (for safety monitoring), those in the experimental arm were advised only by the algorithm for any ongoing titration of medication. At 6 weeks, the investigators found that BPs were lower in the intervention group, and diastolic BPs remained lower at 6 months.

This methodology emphasizes the potential utility of true self-management of hypertension in the postpartum period. It relies, however, on having a highly developed system in place that can receive the data,

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## **Do-it-yourself options for remote blood pressure monitoring**

### **Electronic health record (EHR) messaging**

Most EHR systems have some form of patient messaging built in. Consider asking your patient to:

- message her blood pressure measurements every 1 to 2 days
- send a photo of handwritten blood pressure measurements

### **Vendor text messaging platforms**

The year 2020 has seen the entire telehealth space grow tremendously, and platforms such as Doxy.me (<https://doxy.me>) and Updox (<https://www.updodx.com>) allow secure text messaging with patients.

### **All-in-one connected vendor solutions**

Third-party solutions are available that give the patient a connected blood pressure cuff, scale, and personalized app. For the clinician, these data then can be accessed either independently through a portal or can be integrated into the EHR. Examples of 2 companies include:

- Babyscripts (<https://www.getbabyscripts.com>)
- Wildflower Health (<https://www.wildflowerhealth.com>)

### **Telehealth visits**

Scheduling weekly telephone or video visits (while not near the frequency of the above) would still yield greater engagement, and many payors currently reimburse for these visits at rates on par with in-person visits.

respond with recommendations, and safely monitor for any aberrations in the feed. Still, this hybrid method may represent the sweet spot: a combination that ensures adequate surveillance while not overburdening the clinician with the simpler, initial steps in postpartum antihypertensive management.

### **Solution 3: The DIY system**

*“That’s a good point. I want to hear about your blood pressure readings in the meantime. Here’s what we can do.”*

What about the 99% of practicing ObGyns who do not have an entire connected system for remote hypertension monitoring? A number of options can be put in place today with little cost and even less tech know-how (see “Do-it-yourself options for remote blood pressure monitoring,” on page 44). Note that since many of these options would not be

monitored in “real time” like the connected systems discussed above, the patient should be given strict parameters for contacting her clinician directly. These do-it-yourself, or DIY, methods are instead best for the purpose of chronic monitoring and medication titration but are still an improvement in communication over the single-serve BP check.

### **The bottom line**

Pregnant women represent one of the most connected, Internet-savvy demographic groups of any patient population: More than three-quarters of pregnant women turn to the Internet for advice during their pregnancy.<sup>9,10</sup> In addition, unlike most social determinants of health, such as housing, food access, and health care coverage, access to connected electronic devices differs little across racial lines, suggesting the potential for targeting

health care inequities by implementing more—not less—technology into prenatal and postpartum care.

For this generation of new mothers, the in-office postpartum BP check is insufficient, artificial, and simply a waste of everyone's time. While there is no one-size-fits-all approach, there are many options, and it is up

to us as health care providers to facilitate the right care, in the right place, at the right time for our patients. ●

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### References

1. American College of Obstetricians and Gynecologists. ACOG practice bulletin summary, No. 222. Gestational hypertension and preeclampsia. *Obstet Gynecol.* 2020;135:1492-1495.
2. American College of Obstetricians and Gynecologists' Task Force on Hypertension in Pregnancy. Hypertension in pregnancy. *Obstet Gynecol.* 2013;122:1122-1131.
3. Walters BN, Thompson ME, Lee A, et al. Blood pressure in the puerperium. *Clin Sci.* 1986;71:589-594.
4. Hirshberg A, Downes K, Srinivas S. Comparing standard office-based follow-up with text-based remote monitoring in the management of postpartum hypertension: a randomised clinical trial. *BMJ Qual Saf.* 2018;27:871-877.
5. Hirshberg A, Sammel MD, Srinivas SK. Text message remote monitoring reduced racial disparities in postpartum blood pressure ascertainment. *Am J Obstet Gynecol.* 2019;221:283-285.
6. Hauspurg A, Lemon LS, Quinn BA, et al. A postpartum remote hypertension monitoring protocol implemented at the hospital level. *Obstet Gynecol.* 2019;134:685-691.
7. Hoppe KK, Thomas N, Zernick M, et al. Telehealth with remote blood pressure monitoring compared to standard care for postpartum hypertension. *Am J Obstet Gynecol.* 2020;S0002-9378(20)30554-8. doi:10.1016/j.ajog.2020.05.027.
8. Cairns AE, Tucker KL, Leeson P, et al. Self-management of postnatal hypertension. *Hypertension.* 2018;72:425-432.
9. Pew Research Center. Mobile fact sheet, 2019. <https://www.pewresearch.org/internet/fact-sheet/mobile/>. Accessed June 16, 2020.
10. Sayakhot P, Carolan-Olah M. Internet use by pregnant women seeking pregnancy-related information: a systematic review. *BMC Pregnancy Childbirth.* 2016;16:65.

The “Break This Practice Habit” series is spearheaded by Dr. Lauren Demosthenes, who makes overarching high value cost decisions in her role as Medical Director of High Value Care and Innovation, Department of ObGyn at Greenville Health System in Greenville, South Carolina. Watch for case presentations of low value, low evidence practices that should be questioned in current day, followed by reasons why that practice should be abandoned. If you would like to contribute to this series, please submit your query to Dr. Demosthenes at [ldemosthenes@mdedge.com](mailto:ldemosthenes@mdedge.com).