Advances in postpartum hypertension management: a review of current guidelines and interventions

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The increased cardiovascular risk associated with hypertensive disorders of pregnancy (HDP) necessitates methods to improve cardiometabolic health in this population. Postpartum hypertension clinics providing cardiovascular assessment, lifestyle counseling, and medication management have emerged as one such strategy. This review examines current recommendations and interventions for care of postpartum HDP patients and highlights the need for research into solutions merging clinical practice with digital health innovations, ultimately improving long-term maternal health.

Hypertensive disorders of pregnancy (HDP), including preeclampsia and gestational hypertension, are among the most common adverse pregnancy outcomes (APOs) and significantly elevate the risk of long-term cardiovascular disease (CVD)[1–7]. For example, estimates derived from a meta-analysis of 22 studies investigating risks associated with preeclampsia suggest an approximately doubled risk of stroke or coronary heart disease and a quadrupled risk of heart failure[3]. Given this increased risk, the American College of Obstetricians and Gynecologists (ACOG) and the American Heart Association (AHA) recognize the postpartum period as a critical time for blood pressure (BP) management, CVD risk factor screening, and additional optimization of cardiovascular health (CVH)[2,5–9]. As a result, structured postpartum follow-up for HDP is essential but remains underutilized, with data from one retrospective cohort study demonstrating low (around 20%) rates of glucose or lipid screening among patients with HDP in the first year postpartum[10].

Multidisciplinary postpartum hypertension clinics have emerged as strategies to improve postpartum follow-up and CVH screening and management (https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf)[7]. Clinic visits may address medication management, cardiometabolic screening, lifestyle assessment, and patient education, as well as serve as a bridge to primary care (https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf)[7]. However, studies investigating these clinics, as well as

additional digital health interventions to facilitate follow-up and lifestyle change, are limited by their relatively small size and heterogeneous protocols. In this review, we will discuss the importance of the postpartum timeframe in maternal CVH, the multidisciplinary structure of postpartum cardiovascular care clinics, recommended domains for assessment and counseling in the postpartum timeframe, and research surrounding interventions to improve postpartum follow-up and ultimately maternal health outcomes.

Postpartum follow-up and the fourth trimester

The "fourth trimester" (the first 12 weeks post-delivery) as well as the first year postpartum present a critical opportunity to identify, assess, and address cardiovascular risk factors that may have emerged during pregnancy[4,6–8]. For many reproductive-age individuals, the postpartum timeframe represents a period where they are more significantly engaged in the healthcare system and may be more likely to have adequate health insurance, facilitating CVH screening and risk factor management[4,6,8,11]. Several AHA publications, including a recent 2024 statement, have emphasized the importance of conducting a thorough CVH evaluation after an APO and specifically after HDP[2,6,8,9,12]. The AHA recommends regular screening for cardiovascular risk factors in the first year postpartum with visits at intervals of 6 weeks, 8–12 weeks, 6 months, and 12 months postpartum[2,6]. This screening should be conducted using the components of Life's Essential 8: lipids, BP, blood glucose, weight, sleep, diet, physical activity, and avoidance of nicotine, as well as accounting for factors specific to the postpartum patient, including contraception and lactation counseling

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and planning for repeat pregnancies (Figs. 1 and 2, Table 1)[2,6,13]. An analysis of the UK Biobank cohort found that individuals with prior APO and high CVH using a Life's Essential 8 framework had significantly decreased rates of incident CVD compared to those with a low CVH assessed via Life's Essential 8, demonstrating the utility of this framework in assessing CVH in this population[14].

The postpartum period is not merely a recovery phase after childbirth; it is a crucial window for identifying individuals at risk of developing CVD and for implementing effective preventive strategies. Unfortunately, this vital opportunity is frequently overlooked in current clinical practices[2,6,10]. Effective interventions during this crucial period—including lifestyle changes like a balanced diet, regular physical activity, diligent weight management, and appropriate pharmacologic treatments for persistent hypertension—can dramatically shape the long-term health outcomes of individuals. Embracing these strategies not only paves the way for improved individual health but also enhances overall well-being[6].

It is important to consider the structural barriers and other social drivers of health (SDOH), such as access to healthcare, socioeconomic challenges, and racial disparities, that result in many postpartum individuals, especially those from underrepresented populations, lacking essential follow-up care after delivery[6,8,15]. For example, adequacy of health insurance coverage may significantly limit access to postpartum care. In the United States, 41% of births were covered by Medicaid in 2021, and postpartum Medicaid coverage varies from a federally mandated 60 days to 12 months (https://www.medicaid.gov/medicaid/benefits/downloads/2024-maternal-health-at-a-glance.pdf). Other factors that may impact ability to access postpartum care include lack of transportation or childcare and difficulty accommodating work schedules. Clinic design may consider these issues by locating clinics near public transportation options when possible and offering flexible appointment options, such as weekend hours or telehealth[11]. Home visiting programs for low-income postpartum populations have shown some benefit in reducing postpartum emergency department usage and increasing participation in government aid programs and may be considered as a complement to postpartum clinics[16,17]. Overall, integrating multidisciplinary postpartum CVH clinics can address gaps in care on a local level as well as work to improve structural barriers, ensuring vulnerable populations receive timely and effective interventions[6].

Care models for postpartum maternal health or cardiovascular clinics

The following section focuses on the role of structured postpartum hypertension clinics in facilitating cardiovascular risk assessment and management of individuals with prior HDP. The importance and benefit of prompt postpartum screening in this population is highlighted by a retrospective cohort study of 4194 postpartum women with HDP, which demonstrated that those who received early BP screening (6–12 months postpartum) were more likely to have cardiovascular risk factors identified compared to those who received BP screening more than one year after delivery[18]. Increasing evidence highlights the effectiveness of postpartum clinics in improving postpartum follow-up, risk stratification, and long-term cardiovascular care (Table 2)[19–21].

These postpartum clinics facilitate early postpartum follow-up, risk stratification, and engagement with primary care providers. Celi et al. report on the success of a postpartum clinic based at Brigham and Women's Hospital staffed by an internist seeing patients with recent HDP[21]. A total of 412 patients were referred in five years, and a total of 48.3% required antihypertensive medication adjustments, underscoring the utility of structured postpartum follow-up in optimizing CVH[21]. Another cohort study in Ontario, Canada, demonstrated that the introduction of a maternal health clinic accurately identified postpartum patients with cardiovascular risk: individuals in the postpartum maternal health clinic were identified to have increased 30 year- and lifetime CVD risk, compared to controls[19]. A small retrospective cohort study in Canada involving 21 participants demonstrated noteworthy improvements in physical activity rates among those who attended a postpartum preeclampsia clinic[20]. This underscores the significant role these clinics can play in promoting healthier lifestyles in this population, suggesting that they are crucial in enhancing postnatal care and well-being[20].

The Follow-Up PreEClampsia Outpatient Clinic (FUPEC) study is a large ongoing prospective cohort study in the Netherlands that collects CVH data of individuals with a history of severe preeclampsia seen by FUPEC[22]. The FUPEC model is a multidisciplinary clinic between obstetrics and internal medicine that provides detailed and long-term cardiovascular screening and follow-up for patients with prior severe preeclampsia[22]. The FUPEC model focuses on the very high-risk population of patients with prior severe preeclampsia, and this study's ongoing data collection and
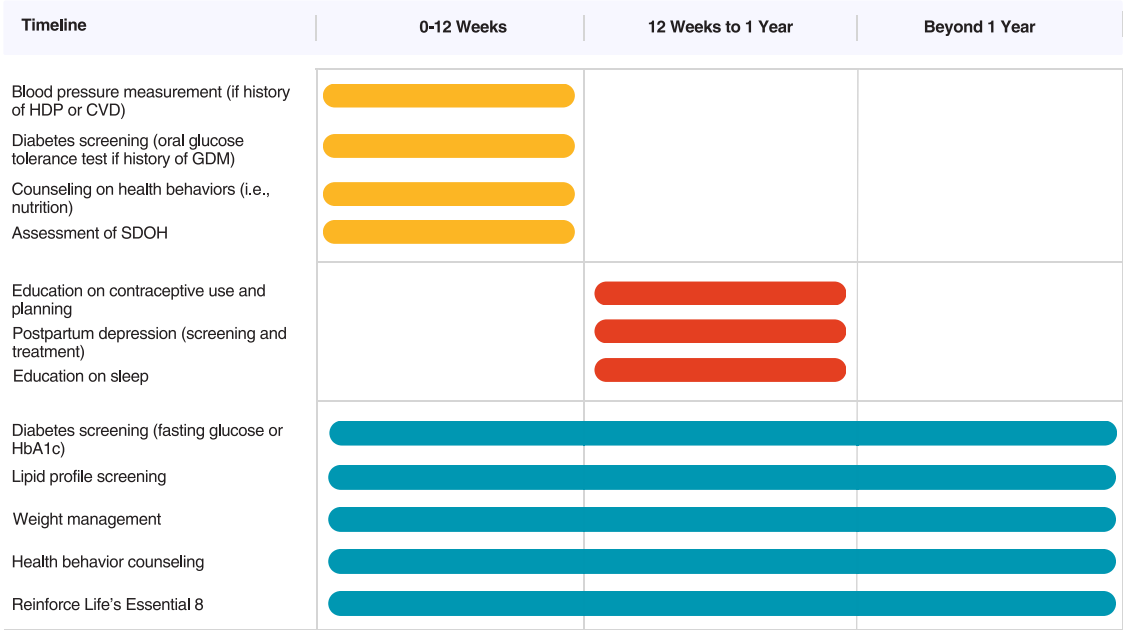

Fig. 1 | Components of comprehensive cardiovascular health screening and management in postpartum clinics. BPM blood pressure monitoring, EMR electronic medical record, SDOH social determinants of health.
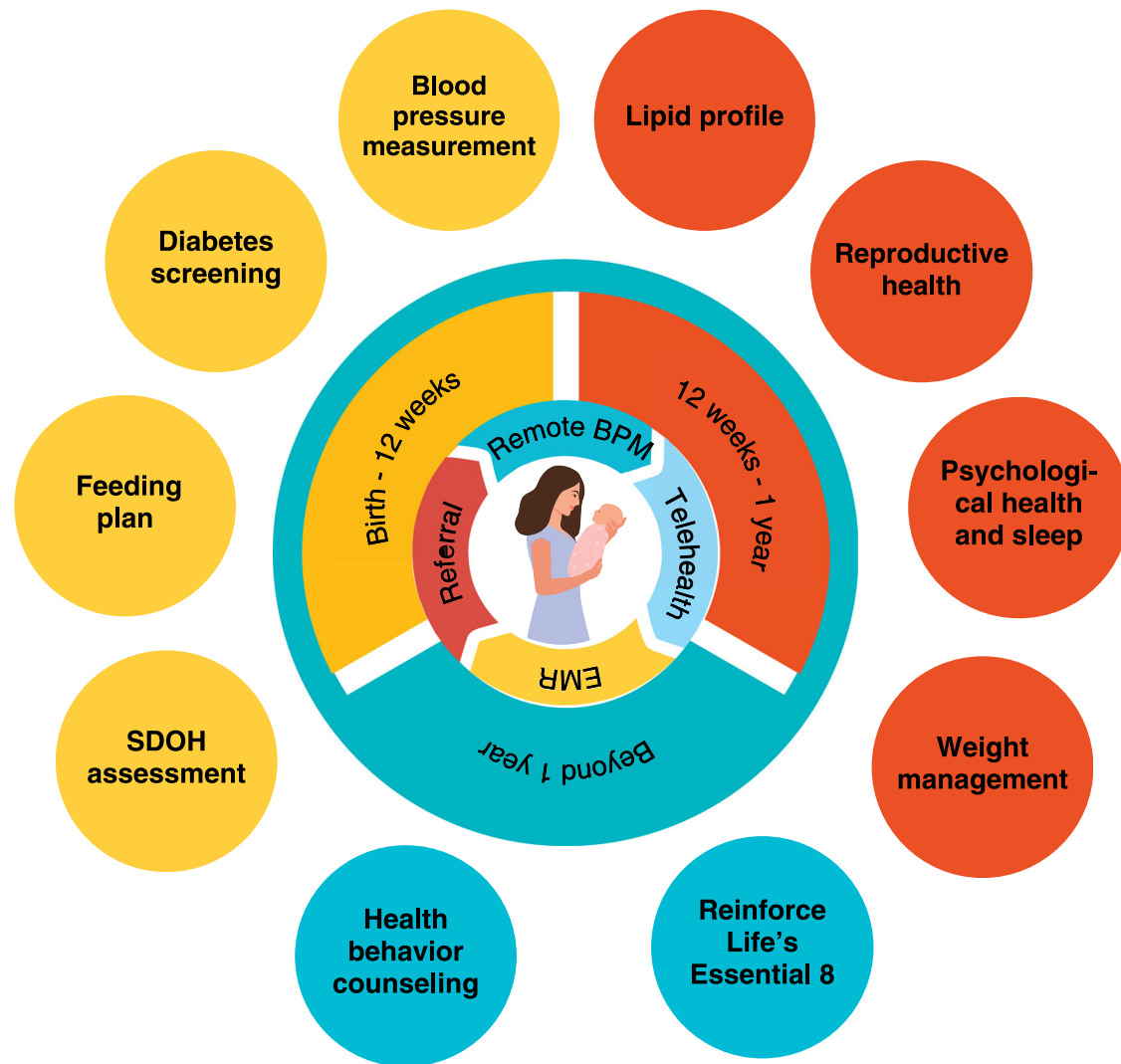
Fig. 2 | Considerations for comprehensive cardiovascular screening performed at regular intervals in postpartum clinics. HDP hypertensive disorder of pregnancy, CVD cardiovascular disease, GDM gestational diabetes mellitus, SDOH social determinants of health, HbA1c hemoglobin A1c

biobank offers a wealth of important data that may inform further risk stratification and tailoring cardiovascular interventions in this population[22]. Depending on local resources and need, postpartum hypertension clinics may be limited to the highest-risk populations (such as patients with severe preeclampsia) or broadened to include all patients with HDP.

Developing an effective postpartum CVH clinic is crucial as a bridge between obstetric to cardiology care (Figs. 1 and 2). A guide to clinic development can be the American College of Cardiology's Postpartum Hypertension Clinic Development Toolkit and the AHA guidelines on managing APO and psychological health, which provides a structured framework for postpartum care, beginning immediately after delivery, continuing through the fourth trimester and extending into long-term follow-up (https://www.acc.org/-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf)[6,23]. Using this framework and AHA guidelines, clinics should monitor individuals periodically as described earlier. The initial phase includes regular BP monitoring, lifestyle counseling, and cardiovascular risk assessments to identify emerging issues. After the first year, clinics may emphasize health behavior counseling and continuous assessment of cardiovascular risk factors to detect any lingering or emerging concerns or issues (https://www.acc.org/-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-

Partum-Hypertension-Clinical-Toolkit.pdf). Free toolkits are available for download from the California Maternal Quality Care Collaborative (CMQCC) to enhance HDP care (https://www.cmqcc.org/quality-improvement-toolkits/hypertensive-disorders-pregnancy/hypertension-and-preeclampsia-data.; https://www.cmqcc.org/toolkits-quality-improvement/hypertensive-disorders-pregnancy). Additionally, member hospitals can utilize maternal data centers to monitor progress in quality improvement, which provides extra guidelines and models for improving care delivery (https://www.cmqcc.org/quality-improvement-toolkits/hypertensive-disorders-pregnancy/hypertension-and-preeclampsia-data.; https://www.cmqcc.org/toolkits-quality-improvement/hypertensive-disorders-pregnancy).

Postpartum hypertension clinics may follow two models: combined or single specialty[7,21]. The integrated care model offers a groundbreaking approach by potentially uniting cardiology, primary care, and nephrology with obstetrics and maternal-fetal medicine in one comprehensive visit, typically held within a specialized cardio-obstetrics clinic[7]. This innovative method stands in stark contrast to the traditional single specialty model, which operates separately across obstetrics, cardiology, primary care, or nephrology, ultimately enhancing patient convenience and outcomes[7].

Multidisciplinary teams, including physicians, advanced practice providers, nurses, and pharmacists, enhance care (https://www.acc.org/-/media/

Table 1 | Guidelines and targets for cardiovascular health assessment and management in the postpartum patient (https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf)[6,7,66]

Domain	Recommendations	Management and additional considerations
Cardiovascular health metric		
Blood pressure	- Every visit; consider home monitoring	- Expect return to pre-pregnancy levels by 12 weeks - Target <120/80 mmHg (< 130/80 mmHg if chronic HTN)
Blood glucose	- 2-h oral glucose tolerance within 12 weeks postpartum, or fasting plasma glucose or hemoglobin A1c in first year postpartum	- Consider National Diabetes Prevention Program clinics if history of GDM
Lipid panel	- Once in first year postpartum, target around 12 weeks postpartum	- Awareness of impact of lactation on lipid parameters
Health behaviors		
Diet	- Educate on DASH or Mediterranean diet	- Consider referral to dietician
Physical activity	- Goal 150 min/week of moderate activity, supervised by OBGYN in early postpartum period	- Recommendations per OBGYN in early postpartum period may vary depending on delivery mode
Tobacco/Nicotine	- Total avoidance of tobacco or nicotine	- Employ behavioral, psychosocial, pharmacologic approaches to promote cessation as needed
Weight management		
	- Regularly assess weight +/− waist circumference with consideration of time since delivery - Educate on adverse effects of obesity on future reproductive and cardiovascular risk	- Consider dietician, weight loss clinic referral - Consider use of GLP1 or GLP1/GIP agonist in non-lactating/non-pregnant patient
Behavioral health		
Psychological health	- Screen at least once for postpartum depression with validated tool (ex. EDPS or PHQ-9)	- Consider behavioral health referral - Screen more frequently depending on patient risk
Sleep	- Evaluate for sleep disturbance	
Reproductive health		
Lactation	- Educate on cardiovascular benefit - Screen for lactation issues at least once	- Consider lactation consultant referral as needed - Consider when prescribing medications - Consider risk vs. benefit discussion regarding lactation duration vs. statin treatment in certain patients
Contraception	- Screen at least once for contraceptive use to minimize risk of short interpregnancy interval	- LARC most effective option - Consider risk of exacerbated HTN with estrogen-containing oral contraceptives - Recommend if plan to use potentially teratogenic medications (ex. ACEi/ARB)
Pregnancy planning	- Educate on importance of optimizing cardiovascular health prior to pregnancy and careful management during pregnancy to minimize APO reoccurrence risk	- Encourage contraceptive use as needed to facilitate this
Social drivers of health		
	- Screen at least once, consider EMR-based screening	- Construct list of local resources - Consider social work, nurse navigator, or postpartum doula to facilitate care coordination

HTN hypertension, *GDM* gestational diabetes mellitus, *OBGYN* obstetrics and gynecology, *GLP1* glucagon-like peptide 1, *GIP* glucose-dependent insulinotropic peptide, *EDPS* Edinburgh Postnatal Depression Scale, *PHQ-9* Patient Health Questionnaire-9, *LARC* long-acting reversible contraceptive, *ACEi* angiotensin-converting enzyme inhibitor, *ARB* angiotensin II receptor blocker, *APO* adverse pregnancy outcome.

[Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf](https://www.acc.org)[6,7,11]. Dedicated nurses and pharmacists support patient visits, medication adjustments, and education on BP measurement, antihypertensives, and risk reduction ([https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf](https://www.acc.org))[6,7]. In addition, nutritionists, health coaches, clinical psychologists, and patient (peer) mentors/advocates all may play vital roles[6]. These professionals may foster a sustained and engaged support system that facilitates continued follow-up. Additionally, targeted patient education initiatives can empower women with knowledge about their cardiovascular risks, promoting adherence to lifestyle modifications and facilitating shared decision-making[6]. For example, as described previously, Janmohamed et al. (2015) report on the increased physical activity found in postpartum patients seen at their multidisciplinary postpartum clinic comprised of a physician, a nurse practitioner, a dietitian, and a pharmacist[20].

Domains for comprehensive cardiovascular screening and management in postpartum clinics

Comprehensive cardiovascular screening and management in postpartum clinics should include BP, blood glucose, lipids, assessment of health behaviors, evaluation of lactation, contraception, and future pregnancy planning, as well as assessment of SDOH (Table 1) ([https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf](https://www.acc.org))[6,7]. Several studies that have evaluated postpartum interventions aimed at reducing CVD risk among women with prior APOs (Table 2).

Blood pressure

HDPs, such as gestational hypertension and preeclampsia, are defined by elevated BP (>140/90 mmHg) after 20 weeks of gestation in pregnancy or while postpartum[5,24]. Preeclampsia is defined as gestational hypertension accompanied by proteinuria[5,24]. It may be classified as severe if one or more of the following features are present: BP that equals or exceeds 160/

Table 2 | Selected studies evaluating postpartum interventions

Study	Sample; design	Intervention	Follow-up time	Key findings
Postpartum clinic and screening interventions				
Celi et al., 2019[21]	412; cohort	Postpartum clinic with provision of BP monitors for home BP monitoring electronically or with visiting nurse, education on nutrition and other lifestyle changes; eventual transfer of care to primary care	5 years	- Average patient 2–3 visits - Increased BP monitor acquisition from 56.8% (44/94) to 93.8% (61/65) - Anti-HTN meds adjusted in 48.6% (199/412)
Daubert et al., 2024[18]	4194; cohort	Postpartum BP screening 6–12 months after delivery vs ≥12 months after delivery	Median 3.7 years	- In women with HDP, increased CV risk factor detection with early BP screening (adj. HR: 2.70, 95% CI:2.33–3.23)
Cameron et al., 2024[49]	129; cohort	Enhanced postpartum referral pathway to women's health- focused PCP	13 months	Increased rates of - PCP visit: adj. OR 6.0; 95% CI 4.0–9.0 - Lipid screening: adj. OR 2.4; 95% CI 1.6–3.9 - HbA1c screening: adj. OR 2.5; 95% CI 1.7–3.7
Cusimano et al., 2014[19]	92; cohort	Postpartum CV clinic (Maternal Health Clinic) with complete assessment including screening history, examination, fasting bloodwork and urinalysis	17 months	- Postpartum clinic patients had increased lifetime and 30-year CV disease estimates and rates of metabolic syndrome compared to healthy controls
Janmohammed et al., 2015[20]	21; cohort	Interdisciplinary postpartum clinic with educational counseling on lifestyle modifications	At least 6 months	- Increased rates of physical activity (14–76%)
Telehealth; remote BP monitoring interventions				
Cairns et al., 2018 (SNAP-HT trial)[28]	91; RCT	Daily self-home BP monitoring using a validated device and telemonitoring	5 follow-up visits in 6 months	- Decreased BP, particularly at 6 weeks postpartum
Benschop et al., 2018[30]	200; cohort	24-hour ambulatory BP monitoring postpartum	Up to 1 year postpartum	- 41.5% of women with previous severe preeclampsia had some form of HTN at one year - Ambulatory BP monitoring necessary to diagnose masked HTN and white coat HTN in 27% of individuals
Sanghavi et al., 2022[36]	236; cohort	Telemedicine visits vs. in-person visits	6 weeks	- Elevated visit completion rate for telemedicine v. in-person (70% vs 32%)
Countouris et al., 2022[11]	175; cohort	Telemedicine visits vs in-person visits	2 years	- 80% attendance rate, out of which 65.7% were telemedicine and 34.2% in-person - No difference in clinical and demographic factors did not differ in between telemedicine vs in-person patients - Telemedicine patients more likely to live further from clinic (11.6 miles v 7.9 miles, $p = 0.02$)
Kitt et al., 2023[27]	220; RCT	Self monitoring of BP along with physician-optimized titration vs usual postnatal care	9 months	- 5.8 mmHg decrease in 24-h mean diastolic BP - 6.5 mmHg decrease in 24-h mean systolic BP
Hirshberg et al., 2023[31]	3997; cohort	Remote BP monitoring program: twice daily text based BP monitoring for 10 days postpartum	6 months	- Decreased adverse outcomes compared to cohort of patients before implementation of remote monitoring program: OR 0.61; 95% CI 0.40–0.98 - No significant difference in adverse outcomes when compared to contemporary cohort - Decreased postnatal emergency department visits and readmissions compared to both controls
Hauspurg et al., 2019[87]	409; cohort	Remote BP monitoring program integrated with electronic medical record and using a call center staffed by nurses for algorithmic management decisions	6 weeks	- 42% with anti-HTN medications started or titrated - 83% retention at 3 weeks postpartum - 88% attendance at standard 6-week postpartum visit
Lemon et al., 2024[32]	12,038; cohort	Text- based home BP monitoring with protocolized management by nursing team	6 weeks	- Decreased 6-week postpartum readmission rates (adj. RR 0.78; 95% CI 0.65–0.93) - Increased rates of BP measurement within 10 days postpartum (propensity score-matched adj. RD 85.4; 95% CI 84.3–86.6) - Increased rates of 6-week postpartum office follow-up (propensity score-matched adj. RD 5.7; 95% CI 3.9–7.6) - Increased rates of anti-HTN medications started (propensity score-matched adj. RR 4.44; 95% CI 3.88–5.07)

Table 2 (continued) | Selected studies evaluating postpartum interventions

Study	Sample; design	Intervention	Follow-up time	Key findings
Lifestyle and pharmacologic interventions				
Ratner et al. 2008, (DPP trial)[38]	2190; RCT	Intensive lifestyle and metformin therapy	3–5 years	- Lifestyle therapy in women with prior GDM decreased incidence of diabetes by 53% vs. placebo (p = 0.002) - Metformin in women with prior GDM decreased incidence of diabetes by 50% vs. placebo (p = 0.006)
Lewey et al. 2022[51]	127; RCT	Digital health intervention incorporating gamification, social incentives and principles of behavioral economics	12 weeks	- Increase in mean daily steps from baseline compared with the control arm.
Rich-Edwards et al. 2019 (Heart Health 4 Moms (HH4M) trial)[50]	151; RCT	Online educational modules, community forum and communication with a lifestyle coach	9 months	- In intervention group, 84% engagement with at least one online educational module; 89% completion of three or more scheduled coaching calls - Increased awareness of CV risk factors (adj. p = 0.01) - Enhanced self-efficacy for maintaining a healthy diet (p = 0.03) - Decreased rates of physical inactivity (p = 0.0006)

BP blood pressure, HTN hypertension, CV cardiovascular, adj adjusted, HR hazard ratio, CI confidence intervals, PCP primary care provider, OR odds ratio, HbA1c hemoglobin A1c, RCT randomized control trial, GDM gestational diabetes mellitus, RR risk ratio, RD risk difference.

Table 3 | Comparison of recommendations for diagnosis and treatment of hypertension in pregnancy[5–7,24,33,34]

Guideline criteria	ACC/AHA[33]	ACOG[24]	NICE[a]	ESC[34]
Goal BP, mmHg	–	–	≤135/85	
Diagnosis, mm Hg	–	≥140 or ≥90	≥140 or ≥90	≥150/95; ≥140/90[b]
Initiation of medication, mm Hg	–	–	≥140 or ≥90	≥150 or ≥95

AHA American Heart Association, ACOG American College of Gynecology, NICE National Institute for Health & Care Excellence, ESC European Society of Cardiology, BP blood pressure, mmHg millimeters of mercury.
[a]Available https://www.ncbi.nlm.nih.gov/books/NBK546004/.
[b]With end organ damage/gestational diabetes.

110 mmHg, thrombocytopenia, impaired renal or liver function, pulmonary edema, or neurological symptoms such as refractory headache or visual disturbances[5,24]. BP trajectories in the postpartum period can vary significantly[5–7,24,25]. New-onset hypertension or preeclampsia may also develop in this time frame[5,7,24–26]. Given the risks of severe hypertension and the potential for significant maternal morbidity immediately after delivery, ACOG recommends that postpartum individuals with HDP have their BP checked within 10 days of hospital discharge[6,7,25]. While BP typically normalizes within twelve weeks postpartum, a subset of individuals may still experience elevated BP at this time and should be closely monitored for the development of chronic hypertension[4,6,7].

Postpartum hypertension care clinic visits within 6–12 weeks postpartum should include a BP check, education about lifestyle changes, and pharmacologic treatment as necessary to target goal BP of <120/80 mmHg (or <130/80 mmHg for patients with treated chronic hypertension), based on AHA guidance[4,6,7]. As will be discussed further in a subsequent section, remote BP monitoring programs may be considered based on clinic resources, given evidence from preliminary studies that demonstrate benefits with regards to BP control, hypertension diagnosis, and other outcomes[27–32]. Evaluation of serum creatinine and proteinuria may be considered in individuals with HDP and a history of kidney injury or proteinuria during or prior to pregnancy[6]. Duration of longitudinal follow-up for BP management in the postpartum clinic may vary depending on patient circumstances and clinic resources[7]. Multiple clinical models merit development as to serve the heterogenous postpartum patient population and care settings[7].

A complete discussion of BP agents in postpartum hypertension is beyond the scope of this review and has been reviewed elsewhere[7]. However, commonly used agents for BP management in the postpartum population include labetalol, nifedipine, amlodipine, and enalapril, which are also considered safe in lactation[7]. Additional research is necessary to further investigate and specify the optimal treatment goals and strategies for postpartum hypertension, as there is not a clear consensus on the appropriate BP target for postpartum hypertension, which consequently leads to variation in clinical management[5,6,24]. Extrapolating from ACOG guidelines for antepartum HDP suggests a goal of <140/90 mmHg, which is higher than AHA suggestions and may miss a subset of patients[5,6,24]. Variations exist in the diagnosis and treatment guidelines for HDP established by international medical societies (Table 3) (https://www.ncbi.nlm.nih.gov/books/NBK546004/)[5–7,24,33,34]. Further investigation is needed to determine optimal treatment goals for chronic hypertension during pregnancy and to evaluate the safety of targeting lower BP thresholds (e.g., 130/80 mmHg), like those recommended for the nonpregnant population (https://www.ncbi.nlm.nih.gov/books/NBK546004/)[5–7,24,33,34].

Blood glucose
Although BP management is often the primary focus of postpartum care for patients with HDP, evaluation of blood glucose is an important component

of comprehensive CVH screening, especially given the association between HDPs and the risk of Type 2 DM[1,6]. In addition, HDPs can co-occur with GDM; retrospective cohort data suggests these individuals have increased cardiovascular risk compared to HDP or GDM alone[10,35]. Screening with hemoglobin A1c (HbA1c) or fasting glucose in the first year postpartum should be strongly considered in all individuals with a history of HDP (https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf)[6]. Individuals with history of GDM should be screened with a 2-hour oral glucose tolerance test, ideally within 12 weeks postpartum, according to recommendations from the American Diabetes Association and ACOG[2,6,25,3][6]. A fasting plasma glucose test or HbA1c can be used to screen in the first year postpartum (https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf)[6,36].

Programs following Diabetes Prevention Program (DPP) protocols may be considered for individuals with evidence of glucose intolerance on screening[6]. The DPP was a large multicenter RCT that investigated the impact of intensive lifestyle modification and metformin therapy on individuals at risk of developing Type 2 DM[37,38]. In analyses of patients with a history of GDM over a follow-up period of three years, participants in the lifestyle modification arm and participants in the metformin arm both had reduced incidence of type 2 DM by ~50% compared to the placebo group, reinforcing the importance of postpartum glycemic control strategies in women at high metabolic risk[38]. The National DPP is a 12-month lifestyle intervention program established by the U.S. Center for Disease Control using similar protocols as the original DPP study and aimed to decrease rates of type 2 DM[6,39]. National DPP programs are conducted by coaches with a standard curriculum and include education on diet and exercise strategies and motivational strategies to sustain weight loss[6,39]. These programs have demonstrated success in postpartum individuals with prior GDM and can be considered depending on local resources and patient needs[6,39].

Lipids

Lipid levels, including low density lipoprotein cholesterol (LDL-C) and triglycerides, physiologically rise during pregnancy and are expected to decrease to approximately baseline pre-pregnancy levels by around three months postpartum[6,40,41]. APOs, including HDPs such as preeclampsia, have been linked to the subsequent development of dyslipidemia[1]. Given this, lipid screening should be completed once in the first year postpartum, ideally after 12 weeks postpartum (https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf; https://www.lipid.org/lipid-spin/spring-2024/specialty-corner-lipid-management-pregnancy-and-lactation)[6]. Lactation promotes lipolysis and mobilization of accumulated fat stores, which may impact lipid levels[6,42]. Lactation additionally may limit pharmacotherapy options (https://www.lipid.org/lipid-spin/spring-2024/specialty-corner-lipid-management-pregnancy-and-lactation)[6]. Consequently, clinicians may prefer to postpone lipid screening until after completion of lactation, although both the AHA and National Lipid Association suggest that screening can be considered after the 6–12 week postpartum timeframe despite lactation status (https://www.lipid.org/lipid-spin/spring-2024/specialty-corner-lipid-management-pregnancy-and-lactation)[6,41].

Results of lipid screening may prompt counseling on lifestyle measures or consideration of pharmacologic treatments based on the assessment of atherosclerotic CVD risk and AHA guidelines[6,41,43]. Lifestyle modifications include weight management and dietary modifications, such as reducing saturated fat intake and refined carbohydrates (https://www.lipid.org/lipid-spin/spring-2024/specialty-corner-lipid-management-pregnancy-and-lactation.)[6,41]. Lactation and plans for future pregnancies should be taken into account when considering pharmacologic treatment, and treatment should be individualized for each patient[6,44].

Patients meeting the criteria for statins who are not pregnant or lactating should be placed on appropriate pharmacotherapy along with reliable contraception[6,41,44]. Analysis of the U.S. Patient and Provider Assessment of Lipid Management registry demonstrates women are less likely to receive appropriate statin treatment, underscoring the need to offer treatment to these patients when indicated[41,45]. Patients should additionally be counseled on the potential need to interrupt statin therapy during future pregnancies and during lactation, although this decision should be individualized based on patient risk[6,41,44]. For very high-risk individuals, such as those with familial hypercholesterolemia (FH), clinicians should have a risk vs. benefit discussion about continuing statin treatment during pregnancy[6,41,46]. Decisions on statin treatment in the postpartum timeframe should be individualized based on patient risk and plans for lactation[6,41,46]. Research suggests that patients with FH may lose up to 14 years of statin treatment associated with pregnancy and lactation-related interruptions, which may deleteriously impact atherosclerotic CVD risk management[46]. Regarding other lipid-lowering alternatives, bile-acid sequestrants are not systemically absorbed and thus may be used during pregnancy and lactation, although may require supplementation of fat-soluble vitamins and folic acid (https://www.lipid.org/lipid-spin/spring-2024/specialty-corner-lipid-management-pregnancy-and-lactation.)[41]. Ezetimibe, proprotein convertase subtilisin/kexin type 9 (PCSK9) inhibitors, and bempedoic acid are not recommended in pregnancy or lactation (https://www.lipid.org/lipid-spin/spring-2024/specialty-corner-lipid-management-pregnancy-and-lactation)[41].

Severe hypertriglyceridemia in pregnancy (>500 mg/dL) is associated with increased pancreatitis risk (https://www.lipid.org/lipid-spin/spring-2024/specialty-corner-lipid-management-pregnancy-and-lactation)[41]. Elevated triglycerides pre-pregnancy, along with other types of dyslipidemia, have been associated with increased APO risk (https://www.lipid.org/lipid-spin/spring-2024/specialty-corner-lipid-management-pregnancy-and-lactation)[41]. Individuals with GDM are at increased risk of severe gestational hypertriglyceridemia (https://www.lipid.org/lipid-spin/spring-2024/specialty-corner-lipid-management-pregnancy-and-lactation)[41]. The cornerstone of triglyceride management is lifestyle modification, especially a low-fat diet. Medications such as omega-3 fatty acids may be considered. In patients with symptoms of or history of pancreatitis or severe hypertriglyceridemia, plasma exchange may be considered (https://www.lipid.org/lipid-spin/spring-2024/specialty-corner-lipid-management-pregnancy-and-lactation)[41]. Bile acid sequestrants should be used with caution in patients with hypertriglyceridemia, as they may increase triglyceride levels[41].

Health behaviors: diet, exercise, and tobacco use

As described previously, the postpartum timeframe offers an important opportunity for patient education and counseling on optimization of lifestyle factors for CVH[4,6,8]. Dietary recommendations are similar to the non-postpartum individual and emphasize the DASH (Dietary Approaches to Stop Hypertension) or Mediterranean diet as the most evidence-based diets to decrease cardiovascular risk[6,9]. Dietary adjustments in the postpartum period can improve outcomes in subsequent pregnancies – one prospective cohort study of 7798 individuals found that high adherence to a Mediterranean diet around the time of conception is associated with a 21% decreased risk of APO in subsequent pregnancy (adjusted OR 0.79; 95% CI 0.68–0.92)[47]. Individuals should strive for at least 150 min/week of moderate intensity exercise once they are cleared postpartum for physical activity[6,48]. Patients should be screened for use of tobacco or nicotine products and provided resources and interventions for lifelong cessation[6,49].

Burgeoning evidence demonstrates the benefits of digital health interventions to promote lifestyle changes in postpartum individuals[50,51]. The *Heart Health 4 Moms* (HH4M) RCT evaluated a comprehensive digital health intervention involving 9 months of online educational modules, lifestyle coaching, and access to a community forum in 151 participants with a recent history of preeclampsia[50]. Among the intervention group, 89%

completed at least three scheduled coaching calls[50]. At follow-up, participants in the intervention group demonstrated significantly greater awareness of CVD risk factors ($p = 0.01$), increased self-efficacy for healthy dietary habits ($p = 0.03$), and reduced physical inactivity compared to controls ($p = 0.0006$)[50]. An RCT of 127 postpartum patients with recent HDP assessed the attainment of activity goals with a wearable step tracker over 12 weeks[51]. The trial found that a digital health intervention incorporating gamification with virtual teams and scores significantly increased mean daily step count compared to the control group who solely received daily assessment of progress towards step goals[51]. However, it should be noted that SDOH, such as socioeconomic status, broadband access, and low health or digital literacy, all may impact access to and uptake of digital health technologies[52,53]. As has been reviewed elsewhere and highlighted in a recent AHA statement, equitable implementation of digital health interventions requires both thoughtful consideration of individual patient factors that may affect adoption of the technology and advocacy for research and policy changes, such as improved broadband access and increased recruitment of underserved populations in digital health clinical trials[52,53].

Interventions to promote lifestyle modifications in the postpartum period should take into account the diversity of patient experiences as well as the specific context of the postpartum period and new parenthood. Community-based participatory research models that survey patients and the community to assess their priorities and may include community members in project leadership may be used to optimally tailor research studies and health interventions to patient needs[52,53]. For example, Kókai et al. report on a survey conducted among patients of the FUPEC study to assess patients' desires regarding an app to promote lifestyle modifications for improved CVH[54]. Similar surveys could be used in clinics and in other research projects to facilitate designing targeted interventions for this population, although caution should be used when generalizing surveys with a small sample size.

Weight management

Given the high rates of pre-pregnancy obesity in reproductive-age women, which may be exacerbated by pregnancy weight gain, weight management in the postpartum timeframe is important to reduce cardiovascular and reproductive health risks associated with obesity[6,55]. Weight and potentially waist circumference are thus important metrics to evaluate at postpartum clinic visits (https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf). Behavioral counseling on diet and physical activity as described above facilitates postpartum weight management (https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf)[6]. Clinics based on the National DPP described earlier may be beneficial to promote lifestyle changes and weight loss[6,39]. Referrals to other resources, such as dietitians or other weight loss clinics, should additionally be considered as needed (https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf)[6].

Glucagon-like peptide 1 (GLP1) receptor agonists (semaglutide, liraglutide) and combined glucose-dependent insulinotropic peptide (GIP)/GLP1 agonists (tirzepatide) offer new strategies to medically treat obesity[56–58]. These medications are not approved for pregnancy or lactation due to lack of data but may be considered in non-pregnant, non-lactating individuals on reliable contraception[41,59,60]. Limited retrospective data available investigating GLP1 receptor agonist exposure in early pregnancy showed no increased risk of pregnancy loss[61] or fetal malformation[62], which is reassuring when considering possible inadvertent exposures, but significantly more research is needed on the subject[59,60]. Additional research is also necessary to investigate the impact of these medications on APO risk and long-term outcomes in reproductive-age women. One retrospective cohort study of over 8,000 individuals demonstrated an association between preconception GLP1 receptor agonist use and decreased risk of several APOs (GDM: OR 0.81, 95% CI 0.72–0.91; HDP: OR 0.84; 95% CI 0.76–0.94), but further data is needed on the subject[63].

Reproductive health: lactation, contraception, and pregnancy planning

Postpartum clinic visits may be an opportunity for education about the benefits of breastfeeding, screening for issues with lactation, and referral to lactation consultants as needed(https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf)[6]. Lactation has been associated with decreased rates of cardiac risk factors and CVD, although confounding associated with the ability to breastfeed in these retrospective studies does limit the strength of these conclusions (https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf)[6,64]. Breastfeeding assessment is important to determine appropriate pharmacologic treatment of hypertension, hyperlipidemia, and/or obesity (https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf)[6].

Clinicians should assess contraceptive use for several purposes. Short interpregnancy intervals (<6 months) are associated with increased APO risk in subsequent pregnancy and may interfere with postpartum cardiovascular risk factor management that can decrease risks associated with subsequent pregnancies[6,65]. In addition, use of certain anti-hypertensives, such as angiotensin-converting enzyme inhibitors or angiotensin II receptor blockers, weight management medications, such as GLP-1 receptor agonists, or some lipid-lowering agents may additionally necessitate reliable contraceptive use due to their possible teratogenic effects (https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf)[7].

Significant disparities exist in contraceptive access and use[66]. Utilization of a multidisciplinary team demonstrated higher rates of postpartum contraception uptake and planning, supporting the important role of postpartum hypertension clinics in facilitating contraceptive use[66,67]. When determining the type of contraceptive, long-acting reversible contraceptives, such as intrauterine devices and subdermal implants, are highly effective with a less than 1% rate of failure in one year and, for this reason, are often highly recommended[66]. Estrogen-containing oral contraceptives should be used with caution in those with difficult to control hypertension, as they may exacerbate hypertension[6].

Given the risk of reoccurrence of APOs, patients should be counseled on the benefits of improved cardiometabolic health in decreasing APO risk and the importance of careful pregnancy planning to allow for appropriate management during pregnancy to reduce risk (e.g., aspirin use and strict BP control to minimize risk of recurrent preeclampsia) (https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf)[2,6]. Clinicians may additionally screen for the risk of severe maternal morbidity in pre-conception visits. The use of validated risk scores may be useful for this purpose[68,69].

Social drivers of health

SDOH include socioeconomic, environmental, structural, and psychosocial factors that affect health status and outcomes[70,71]. SDOH should be assessed and considered when making recommendations regarding cardiovascular risk management, as these factors may affect an individual's ability to follow recommendations and are associated with poor cardiovascular outcomes[6,70,71]. For example, considering HDP as a risk factor for CVD, findings from the Nulliparous Pregnancy Outcomes

Study indicate that social environmental factors—particularly social demographics—had a greater impact on hypertension development during pregnancy than behavioral factors (i.e., diet, exercise, smoking)[72]. Additionally, one analysis of pregnant women in National Health Interview Survey data demonstrated that those with the highest quartile SDOH scores were twice as likely to have suboptimal CVH, defined as two or more cardiovascular risk factors, compared to individuals with the lowest quartile SDOH scores (risk ratio 2.05; 95% CI 1.46–2.88)[73]. There are multiple screening tools available to assess SDOH, and health systems may have a preferred tool incorporated into the electronic medical record (EMR)[70,71,74,75]. Clinics may cultivate a list of local resources, such as food banks, for SDOH-related needs[70,71,75]. Use of social workers, nurse navigators, or postpartum doulas may be beneficial for overall care coordination in all patients, regardless of SDOH status[6,71].

It is also important to consider SDOH and systemic barriers to care that exist on the basis of race, ethnicity, socioeconomic status, and other marginalized identities when developing a postpartum clinic to optimize access for all individuals[6,8,70,71,76]. For example, clinics may strive to cultivate a diverse clinic staff that appropriately represents the clinic's patient population[76]. Structural and systemic factors such as access to education and insurance, neighborhood socioeconomic status, structural racism, and others are key elements of SDOH and require policy interventions to adequately address[70,71,76–78]. As described earlier, insurance status is a key factor in healthcare access and may be limited depending on the length of Medicaid coverage in the postpartum period (https://www.medicaid.gov/medicaid/benefits/downloads/2024-maternal-health-at-a-glance.pdf). Clinicians in postpartum clinics can advocate for policy interventions related to these barriers to care[71,76].

Evaluation of psychological health and sleep in postpartum clinics

As highlighted by a 2025 AHA statement on the topic, maternal psychological health in the perinatal period is intimately linked with APO risk and CVH outcomes[23]. Meta-analysis and prospective cohort study data both support an increased risk of postpartum depression after a pregnancy complicated by preeclampsia[23,79,80]. Given this risk of poor postpartum psychological health after APO and associations between perinatal depression and increased CVD risk, assessment of postpartum psychological health is strongly recommended by both the AHA and ACOG[23,81]. Postpartum clinic visits offer an important opportunity for screening (https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf)[7,23]. The Edinburgh Postnatal Depression Scale or Patient Health Questionnaire-9 may be used as validated screening tools for postpartum depression (https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf)[23,82]. Clinicians should consider screening for additional risk factors for postpartum depression, such as sleep disturbance, social support, and previous mental health diagnoses[6,23,83,84]. Clinicians may offer education on symptoms of postpartum depression as well as lifestyle interventions, such as stress management techniques and physical activity[23]. Referrals to behavioral health can be beneficial to address concerns in this domain, and dependent on local resources, direct integration of psychology into a postpartum hypertension clinic can improve access to care (https://www.acc.org//-/media/Non-Clinical/Files-PDFs-Excel-MS-Word-etc/Membership/Sections-Councils/Reproductive-Health-and-Cardio-Obstetrics/ACC-Post-Partum-Hypertension-Clinical-Toolkit.pdf)[23,85].

Strategies to improve retention in postpartum clinics
Telehealth and remote blood pressure monitoring
Recent studies have explored the role of telehealth and self BP monitoring in improving postpartum hypertension management (Table 2)[11,27,28,30–32,86,87]. These interventions have shown promising improvements in outcomes and follow-up rates, but best practices for their implementation are still unclear due to significant heterogeneity in protocols and study design[11,27,28,30–32,86,87].

Telehealth follow-up for postpartum hypertension management demonstrated improved visit completion rates at the Hospital of the University of Pennsylvania[86] and served a patient population on average living at a greater distance from the clinic at the University of Pittsburgh Medical Center[11], suggesting this strategy may increase postpartum care access.

Multiple studies have additionally investigated outcomes associated with remote or self-BP monitoring, with improved BP control noted[27,28], decreased postpartum adverse events and emergency department visits[31], and increased rates of 6-week postpartum follow-up and anti-hypertensive medication adjustment[32]. In addition to the improved BP control observed with self-BP monitoring, the Physician-Optimized Postpartum hypertension Treatment Trial (POP-HT) findings suggest improvement in adverse cardiac remodeling in response to BP control as well as improvement in cardiac function[27,29]. One retrospective cohort study of outcomes after ambulatory BP monitoring at one year postpartum in 200 women with severe preeclampsia demonstrated that 41.5% of women with prior severe preeclampsia had hypertension one year postpartum, underscoring the importance of ambulatory BP monitoring in diagnosing masked hypertension and white-coat hypertension[30].

Ultimately, while the evolving data on remote BP monitoring, telehealth, and EMR integration is promising with regard to improving outcomes, increasing follow-up rates, and facilitating access to care, these studies are limited by their heterogeneity and relatively small sample size[11,27,28,30–32,86,87]. Large RCTs on comparative effectiveness and long-term outcomes are necessary to further investigate these strategies. In addition, as described earlier, the impact of digital health interventions such as remote BP monitoring and telehealth, may be limited by accessibility issues and SDOH[52,53]. Implementation in clinics should be done with careful consideration of the patient population served by this clinic and resources needed, such as broadband and digital devices, to access these strategies[52,53]. Clinics may work locally to increase resource accessibility as well as advocate for policy change on the state and federal level[52,53].

Electronic medical record integration and referral types
An EMR-integrated clinic model for postpartum hypertension care can enhance follow-up, improve outcomes, and reduce long-term cardiovascular risks[7,87]. A remote BP monitoring protocol with EMR integration facilitating communication among providers and documentation of BP reading and management showed high rates of participant retention at three weeks (83% out of 409 participants) and high rates of attendance at the six-week postpartum visit (88%)[87]. As outlined by Countouris et al., there are multiple options for referral mechanisms and patient outreach[7]. Referral mechanisms may include automated/default referrals, clinician-initiated referrals, and patient self-referrals[7]. Automated referrals, with appointments scheduled before discharge, can streamline access and enrollment[7]. Systematic chart reviews can identify eligible patients post-discharge, particularly in BP monitoring programs[7]. Patient outreach methods include brochures, BP program messages, or educational videos, with institutional communications teams assisting in developing awareness materials[7]. Social media can be an important delivery method for patient education[88]. EMR-integrated referral pathways have shown benefits in facilitating postpartum screening - Cameron et al. found that a clinician-initiated EMR-integrated postpartum referral pathway to primary care increased the likelihood of primary care visits (48.1%), cholesterol screening (31.8%), and hemoglobin A1c testing (41.9%)[89].

Conclusion
In conclusion, structured postpartum hypertension follow-up is vital for reducing maternal morbidity and long-term cardiovascular risks, particularly for individuals with hypertensive disorders of pregnancy such as preeclampsia and gestational hypertension. Research underscores the heightened risk these women face for chronic hypertension, stroke, and cardiovascular disease later in life. Additionally, these clinics offer healthcare providers the opportunity to screen for and initiate the management of other cardiovascular risk factors, such as diabetes, hyperlipidemia, and

obesity. Advances like EMR-based tracking, remote BP monitoring, and multidisciplinary clinics have shown significant improvements in blood pressure control and medication adherence. Additionally, integrated community models enhance access to care, especially for underserved populations such as Black and Hispanic individuals, who are disproportionately impacted by these conditions.

However, challenges remain, including inconsistent clinical guidelines and the need for a standardized approach to postpartum hypertension management. While both clinic-based and telehealth interventions have shown promise, further research is necessary to evaluate their scalability and long-term effectiveness. Some of this research could be conducted through postpartum clinics, as these clinics can be a useful site for additional data collection and analysis that may further inform care practices, exemplified by research conducted through the FUPEC study in the Netherlands. Federal and state-level policy initiatives, such as extension of Medicaid coverage to 12 months postpartum or expansion of broadband access, also play an important role in improving postpartum health and facilitating implementation of postpartum CVH programs. The inclusivity and accessibility of any care strategy targeted towards improving CVH in this high-risk population should be evaluated to ensure that strategies address and reduce care disparities. Addressing these issues is crucial for improving maternal health outcomes and preventing future cardiovascular disease. This review calls for ongoing research into comprehensive and scalable care models that effectively bridge clinical practice with digital health innovations, thereby enhancing postpartum hypertension management and reducing health disparities.

Data availability

This manuscript is based on publicly available medical literature and references. All sources used are cited within the manuscript and can be accessed through respective publishers, databases, or repositories.

Abbreviations

APO	Adverse pregnancy outcome
HDP	Hypertensive disorder of pregnancy
DM	Diabetes mellitus
GDM	Gestational diabetes mellitus
MI	Myocardial Infarction
HF	Heart Failure
OR	Odds Ratio
CI	Confidence Interval
ACOG	American College of Obstetrics and Gynecology
AHA	American Heart Association
CVH	Cardiovascular health
CVD	cardiovascular disease
FUPEC	Follow-up Preeclampsia Outpatient Clinic
HbA1c	Hemoglobin A1c
BP	Blood pressure
RCT	Randomized control trial
DPP	Diabetes Prevention Program
DASH	Dietary Approaches to Stop Hypertension
U.S.	United States
SDOH	Social drivers of health
EMR	Electronic medical record

References

1. O'Kelly, A. C. et al. Pregnancy and reproductive risk factors for cardiovascular disease in women. *Circ. Res.* **130**, 652–672 (2022).
2. Parikh, N. I. et al. Adverse pregnancy outcomes and cardiovascular disease risk: unique opportunities for cardiovascular disease prevention in women: a scientific statement from the American Heart Association. *Circulation* **143**, e902–e916 (2021).
3. Wu, P. et al. Preeclampsia and future cardiovascular health: a systematic review and meta-analysis. *Circ: Cardiovasc. Qual. Outcomes* **10**, e003497 (2017).
4. Khosla, K. et al. Long-term cardiovascular disease risk in women after hypertensive disorders of pregnancy: recent advances in hypertension. *Hypertension* **78**, 927–935 (2021).
5. Garovic, V. D. et al. Hypertension in pregnancy: diagnosis, blood pressure goals, and pharmacotherapy: a scientific statement from the American heart association. *Hypertension* **79**, e21–e41 (2022).
6. Lewey, J. et al. Opportunities in the postpartum period to reduce cardiovascular disease risk after adverse pregnancy outcomes: a scientific statement from the American Heart Association. *Circulation* **149**, e330–e346 (2024).
7. Countouris, M. et al. Hypertension in pregnancy and postpartum: current standards and opportunities to improve care. *Circulation* **151**, 490–507 (2025).
8. Mehta, L. S. et al. Call to action: maternal health and saving mothers: a policy statement from the American Heart Association. *Circulation* **144**, e251–e269 (2021).
9. Brown, H. L. et al. Promoting Risk Identification and Reduction of Cardiovascular Disease in Women Through Collaboration With Obstetricians and Gynecologists: A Presidential Advisory From the American Heart Association and the American College of Obstetricians and Gynecologists. *Circulation* **137**, e843–e852 (2018).
10. Lumsden, R., Page, C. B., Phelan, M., Wheeler, S. & Pagidipati, N. Longitudinal Management of Cardiovascular Risk Factors Among Postpartum Women. *J. Womens Health* **33**, 853–862 (2024).
11. Countouris, M. et al. Feasibility of utilizing telehealth in a multidisciplinary postpartum hypertension clinic. *Womens Health Rep.* **3**, 877–886 (2022).
12. Mosca, L. et al. Effectiveness-based guidelines for the prevention of cardiovascular disease in women—2011 update: a guideline from the American Heart Association. *Circulation* **123**, 1243–1262 (2011).
13. Lloyd-Jones, D. M. et al. Life's essential 8: updating and enhancing the American Heart Association's construct of cardiovascular health: a presidential advisory from the American Heart Association. *Circulation* **146**, e18–e43 (2022).
14. Chen, H. et al. Life's Essential 8 and cardiovascular disease in women with a history of adverse pregnancy outcomes. *Eur. J. Prev. Cardiol.* zwaf021, https://doi.org/10.1093/eurjpc/zwaf021 (2025).
15. Crear-Perry, J. et al. Social and structural determinants of health inequities in maternal health. *J. Womens Health* **30**, 230–235 (2021).
16. Rokicki, S. et al. Home visits and the use of routine and emergency postpartum care among low-income people: a secondary analysis of a randomized clinical trial. *JAMA Netw. Open* **7**, e2451605 (2024).
17. Rokicki, S. et al. Impact of nurse home visiting on take-up of social safety net programs in a Medicaid population. *Health Aff. Sch.* **3**, qxaf038 (2025).
18. Daubert, M. A. et al. Early postpartum blood pressure screening is associated with increased detection of cardiovascular risk factors in women with hypertensive disorders of pregnancy. *Am. Heart J.* **273**, 130–139 (2024).
19. Cusimano, M. C., Pudwell, J., Roddy, M., Cho, C.-K. J. & Smith, G. N. The maternal health clinic: an initiative for cardiovascular risk identification in women with pregnancy-related complications. *Am. J. Obstet. Gynecol.* **210**, 438.e1–438.e9 (2014).
20. Janmohamed, R. et al. Cardiovascular risk reduction and weight management at a hospital-based postpartum preeclampsia clinic. *J. Obstet. Gynaecol. Can.* **37**, 330–337 (2015).
21. Celi, A. C., Seely, E. W., Wang, P., Thomas, A. M. & Wilkins-Haug, L. E. Caring for women after hypertensive pregnancies and beyond: implementation and integration of a postpartum transition clinic. *Matern. Child Health J.* **23**, 1459–1466 (2019).

22. van der Bijl, M. F. et al. FUPEC study, a prospective open-cohort on severe pre-eclampsia and cardiovascular risk factors based in the Netherlands. *BMJ Open* **14**, e093423 (2024).

23. Sharma, G. et al. Optimizing psychological health across the perinatal period: an update on maternal cardiovascular health: ascientific statement from the American Heart Association. *J. Am. Heart. Assoc.* **14**, 1–18 (2025).

24. Gestational Hypertension and Preeclampsia: ACOG Practice Bulletin, Number 222. *Obstet. Gynecol.* **135**, e237–e260 (2020).

25. ACOG Committee Opinion No. 736: Optimizing Postpartum Care. *Obstet. Gynecol.* **131**, e140–e150 (2018).

26. Hauspurg, A. & Jeyabalan, A. Postpartum preeclampsia or eclampsia: defining its place and management among the hypertensive disorders of pregnancy. *Am. J. Obstet. Gynecol.* **226**, S1211–S1221 (2022).

27. Kitt, J. et al. Long-term blood pressure control after hypertensive pregnancy following physician-optimized self-management: the POP-HT randomized clinical trial. *JAMA* **330**, 1991–1999 (2023).

28. Cairns, A. E. et al. Self-management of postnatal hypertension: the SNAP-HT trial. *Hypertension* **72**, 425–432 (2018).

29. Kitt, J. et al. Cardiac remodeling after hypertensive pregnancy following physician-optimized blood pressure self-management: the POP-HT randomized clinical trial imaging substudy. *Circulation* **149**, 529–541 (2024).

30. Benschop, L. et al. Blood pressure profile 1 year after severe preeclampsia. *Hypertension* **71**, 491–498 (2018).

31. Hirshberg, A., Zhu, Y., Smith-McLallen, A. & Srinivas, S. K. Association of a remote blood pressure monitoring program with postpartum adverse outcomes. *Obstet. Gynecol.* **141**, 1163–1170 (2023).

32. Lemon, L. S. et al. Clinical outcomes associated with a remote postpartum hypertension monitoring program. *Obstet. Gynecol.* **144**, 377–385 (2024).

33. Whelton, P. K. et al. 2017 ACC/AHA/AAPA/ABC/ACPM/AGS/APhA/ASH/ASPC/NMA/PCNA guideline for the prevention, detection, evaluation, and management of high blood pressure in adults: executive summary: a report of the American College of Cardiology/American Heart Association Task Force on clinical practice guidelines. *Hypertension* **71**, 1269–1324 (2018).

34. Williams, B. et al. 2018 ESC/ESH Guidelines for the management of arterial hypertension. *Eur. Heart J.* **39**, 3021–3104 (2018).

35. Echouffo Tcheugui, J. B., Guan, J., Fu, L., Retnakaran, R. & Shah, B. R. Association of concomitant gestational hypertensive disorders and gestational diabetes with cardiovascular disease. *JAMA Netw. Open* **5**, e2243618 (2022).

36. ElSayed, N. A. et al. 15. Management of diabetes in pregnancy: standards of care in diabetes—2023. *Diab. Care* **46**, S254–S266 (2023).

37. Ratner, R. E. An update on the diabetes prevention program. *Endocr. Pr.* **12**, 20–24 (2006).

38. Ratner, R. E. et al. Prevention of diabetes in women with a history of gestational diabetes: effects of metformin and lifestyle interventions. *J. Clin. Endocrinol. Metab.* **93**, 4774–4779 (2008).

39. Gómez, M. L., Hieronymus, L. B., Ashford, K. B., Barnett, J. M. & Renn, T. A. Linking postpartum and parenting women with a national diabetes prevention program: recruitment efforts, challenges, and recommendations. *Diab. Spectr.* **31**, 324–329 (2018).

40. Montes, A. et al. Physiologic and supraphysiologic increases in lipoprotein lipids and apoproteins in late pregnancy and postpartum. Possible markers for the diagnosis of 'prelipemia'. *Arteriosclerosis* **4**, 407–417 (1984).

41. Agarwala, A. et al. Dyslipidemia management in women of reproductive potential: An Expert Clinical Consensus from the National Lipid Association. *J. Clin. Lipido.* **18**, e664–e684 (2024).

42. Stuebe, A. M. & Rich-Edwards, J. W. The reset hypothesis: lactation and maternal metabolism. *Am. J. Perinatol.* **26**, 81–88 (2009).

43. Grundy, S. M. et al. 2018 AHA/ACC/AACVPR/AAPA/ABC/ACPM/ADA/AGS/APhA/ASPC/NLA/PCNA Guideline on the management of blood cholesterol: a report of the American College of Cardiology/American Heart Association Task Force on clinical practice guidelines. *Circulation* **139**, e1082–e1143 (2019).

44. Grant, J. K. et al. Lipid-lowering therapy in women of childbearing age: a review and stepwise clinical approach. *Curr. Cardiol. Rep.* **24**, 1373–1385 (2022).

45. Nanna, M. G. et al. Sex differences in the use of statins in community practice: patient and provider assessment of lipid management registry. *Circ: Cardiovasc. Qual. Outcomes* **12**, e005562 (2019).

46. Klevmoen, M. et al. Loss of statin treatment years during pregnancy and breastfeeding periods in women with familial hypercholesterolemia. *Atherosclerosis* **335**, 8–15 (2021).

47. Makarem, N. et al. Association of a Mediterranean diet pattern with adverse pregnancy outcomes among US women. *JAMA Netw. Open* **5**, e2248165 (2022).

48. ACOG Committee Opinion No. 804: Physical Activity and Exercise During Pregnancy and the Postpartum Period: Correction. *Obstet. Gynecol.* **138**, 683–683 (2021).

49. Tobacco and Nicotine Cessation During Pregnancy: ACOG Committee Opinion, Number 807. *Obstet. Gynecol.* **135**, e221–e229 (2020).

50. Rich-Edwards, J. W. et al. Randomized trial to reduce cardiovascular risk in women with recent preeclampsia. *J. Womens Health* **28**, 1493–1504 (2019).

51. Lewey, J. et al. Effectiveness of a text-based gamification intervention to improve physical activity among postpartum individuals with hypertensive disorders of pregnancy: a randomized clinical trial. *JAMA Cardiol.* **7**, 591–599 (2022).

52. Kim, D. S., Eltahir, A. A., Ngo, S. & Rodriguez, F. Bridging the gap: how accounting for social determinants of health can improve digital health equity in cardiovascular medicine. *Curr. Atheroscler. Rep.* **27**, 9 (2024).

53. Powell-Wiley, T. M. et al. Role of technology in promoting heart healthy behavior change to increase equity in optimal cardiovascular health: a scientific statement from the American Heart Association. *Circulation* **151**, e972–e985 (2025).

54. Kókai, L. L. et al. Needs and preferences of women with prior severe preeclampsia regarding app-based cardiovascular health promotion. *BMC Womens Health* **22**, 427 (2022).

55. Ogunwole, S. M., Zera, C. A. & Stanford, F. C. Obesity management in women of reproductive age. *JAMA* **325**, 433–434 (2021).

56. Jastreboff, A. M. et al. Tirzepatide once weekly for the treatment of obesity. *N. Engl. J. Med.* **387**, 205–216 (2022).

57. Lincoff, A. M. et al. Semaglutide and cardiovascular outcomes in obesity without diabetes. *N. Engl. J. Med.* **389**, 2221–2232 (2023).

58. Pi-Sunyer, X. et al. A randomized, controlled trial of 3.0 mg of liraglutide in weight management. *N. Engl. J. Med.* **373**, 11–22 (2015).

59. Sharma, G. Treating reproductive-aged women with glucagon-like peptide-1 receptor agonists: what are the clinical considerations?. *Circulation* **150**, 1487–1489 (2024).

60. Drummond, R. F., Seif, K. E. & Reece, E. A. Glucagon-like peptide-1 receptor agonist use in pregnancy: a review. *Am. J. Obstet. Gynecol.* **232**, 17–25 (2025).

61. Dao, K. et al. Use of GLP1 receptor agonists in early pregnancy and reproductive safety: a multicentre, observational, prospective cohort study based on the databases of six Teratology Information Services. *BMJ Open* **14**, e083550 (2024).

62. Cesta, C. E. et al. Safety of GLP-1 receptor agonists and other second-line antidiabetics in early pregnancy. *JAMA Intern. Med.* **184**, 144–152 (2024).

63. Imbroane, M. R., LeMoine, F. & Nau, C. T. Preconception glucagon-like peptide-1 receptor agonist use associated with decreased risk of adverse obstetrical outcomes. *Am. J. Obstet. Gynecol.*

S0002937825000419; https://doi.org/10.1016/j.ajog.2025.01.019 (2025).

64. Schwarz, E. B. et al. Duration of lactation and risk factors for maternal cardiovascular disease. *Obstet. Gynecol.* **113**, 974–982 (2009).

65. Obstetric Care Consensus No. 8: Interpregnancy Care. *Obstet Gynecol* **133**, e51–e72; (2019).

66. Lindley, K. J. et al. Contraception and reproductive planning for women with cardiovascular disease: JACC focus seminar 5/5. *J. Am. Coll. Cardiol.* **77**, 1823–1834 (2021).

67. Miller, H. E. et al. Addressing postpartum contraception practices utilizing a multidisciplinary Pregnancy Heart Team approach. *AJOG Glob. Rep.* **2**, 100100 (2022).

68. Murugappan, G., Alvero, R. J., Lyell, D. J., Khandelwal, A. & Leonard, S. A. Development and validation of a risk prediction index for severe maternal morbidity based on preconception comorbidities among infertile patients. *Fertil. Steril.* **116**, 1372–1380 (2021).

69. Leonard, S. A., Kennedy, C. J., Carmichael, S. L., Lyell, D. J. & Main, E. K. An expanded obstetric comorbidity scoring system for predicting severe maternal morbidity. *Obstet. Gynecol.* **136**, 440–449 (2020).

70. Powell-Wiley, T. M. et al. Social determinants of cardiovascular disease. *Circ. Res.* **130**, 782–799 (2022).

71. Hurwitz, M., Bonomo, J., Spitz, J. & Sharma, G. Intersectionality and social drivers of health in cardiovascular care. *Methodist Debakey Cardiovasc. J.* **20**, 98–110 (2024).

72. Keith, M. H. & Martin, M. A. Social determinant pathways to hypertensive disorders of pregnancy among nulliparous U.S. women. *Womens Health Issues* **34**, 36–44 (2024).

73. Sharma, G. et al. Social determinants of suboptimal cardiovascular health among pregnant women in the United States. *J. Am. Heart Assoc.* **11**, e022837 (2022).

74. Chen, M., Tan, X. & Padman, R. Social determinants of health in electronic health records and their impact on analysis and risk prediction: a systematic review. *J. Am. Med. Inf. Assoc.* **27**, 1764–1773 (2020).

75. White-Williams, C. et al. Addressing social determinants of health in the care of patients with heart failure: a scientific statement from the American Heart Association. *Circulation* **141**, e841–e863 (2020).

76. Lindley, K. J. et al. Socioeconomic determinants of health and cardiovascular outcomes in women. *J. Am. Coll. Cardiol.* **78**, 1919–1929 (2021).

77. Metlock, F. E. et al. Impact of social determinants of health on hypertension outcomes: a systematic review. *Hypertension* **81**, 1675–1700 (2024).

78. Churchwell, K. et al. Call to action: structural racism as a fundamental driver of health disparities: a presidential advisory from the American Heart Association. *Circulation* **142**, e454–e468 (2020).

79. Caropreso, L., De Azevedo Cardoso, T., Eltayebani, M. & Frey, B. N. Preeclampsia as a risk factor for postpartum depression and psychosis: a systematic review and meta-analysis. *Arch. Womens Ment. Health* **23**, 493–505 (2020).

80. Roberts, L., Henry, A., Harvey, S. B., Homer, C. S. E. & Davis, G. K. Depression, anxiety and posttraumatic stress disorder six months following preeclampsia and normotensive pregnancy: a P4 study. *BMC Pregnancy Childbirth* **22**, 108 (2022).

81. Screening and Diagnosis of Mental Health Conditions During Pregnancy and Postpartum: ACOG Clinical Practice Guideline No. 4. *Obstet. Gynecol.* **141**, 1232–1261 (2023).

82. ACOG Committee Opinion No. 757: Screening for Perinatal Depression. *Obstet. Gynecol.* **132**, e208–e212 (2018).

83. Baattaiah, B. A. et al. The relationship between fatigue, sleep quality, resilience, and the risk of postpartum depression: an emphasis on maternal mental health. *BMC Psychol.* **11**, 10 (2023).

84. Lewis, B. A., Gjerdingen, D., Schuver, K., Avery, M. & Marcus, B. H. The effect of sleep pattern changes on postpartum depressive symptoms. *BMC Womens Health* **18**, 12 (2018).

85. Smolderen, K. G. et al. The role of the clinical psychologist in the care of adults with cardiovascular disease. *JACC Adv.* **3**, 100910 (2024).

86. Sanghavi, M. et al. Telemedicine may increase visit completion rates in postpartum patients with preeclampsia. *PLoS One* **17**, e0275741 (2022).

87. Hauspurg, A. et al. A postpartum remote hypertension monitoring protocol implemented at the hospital level. *Obstet. Gynecol.* **134**, 685–691 (2019).

88. Ladeiras-Lopes, R. et al. Social media in cardiovascular medicine: a contemporary review. *Eur. Heart J. Digit Health* **1**, 10–19 (2020).

89. Cameron, N. A. et al. An enhanced postpartum transition program to primary care. *J. Womens Health* **33**, 1417–1422 (2024).

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Competing interests

The authors declare no competing interests.

Additional information