

Postpartum Care up to 1 Year After Pregnancy: A Systematic Review and Meta-Analysis

Executive Summary



Main Points

- **Healthcare Delivery Strategies – Where Care Is Provided**
 - For *general postpartum care* (5 randomized controlled trials [RCTs] and 1 nonrandomized comparative study [NRCS]), whether the visit is conducted at home/by telephone or at the clinic may not impact depression or anxiety symptoms (low strength of evidence [SoE]).
 - For *breastfeeding care* (7 RCTs and 1 NRCS), whether the initial visit is conducted at home or at the pediatric clinic may not impact depression symptoms (up to 6 months postpartum), anxiety symptoms (up to 2 months), hospital readmission (up to 3 months), or other unplanned care utilization (up to 2 months) (all low SoE).
- **Healthcare Delivery Strategies – How Care Is Provided**
 - For *general postpartum care* (4 RCTs), integration of care (e.g., combined versus separate postpartum/well-child visits, multidisciplinary postpartum clinic versus standard care) may not impact depression symptoms or substance use up to 1 year (all low SoE).
- **Healthcare Delivery Strategies – When Care Is Provided**
 - For *contraceptive care* (9 RCTs), earlier, compared with later, contraception is probably associated with comparable continued intrauterine device (IUD) use at 3 and 6 months but greater implant use at 6 months (all moderate SoE).

(continued on page 2)



- **Healthcare Delivery Strategies – Who Provides Care**
 - For *breastfeeding care*, peer support (10 RCTs) is probably associated with higher rates of any breastfeeding at 1 month and 3 to 6 months and of exclusive breastfeeding at 1 month but with comparable rates of exclusive breastfeeding at 3 months and nonexclusive breastfeeding at 1 and 3 months (all low SoE). Care by a lactation consultant (6 RCTs and 1 NRCS) is probably associated with higher rates of any breastfeeding at 6 months but not at 1 month or 3 months. Lactation consultant care is probably associated with comparable rates of exclusive breastfeeding at 1 or 3 months (all moderate SoE).
- **Healthcare Delivery Strategies – Coordination and Management of Care**
 - For *screening/testing care* (1 RCT and 2 NRCSs), provision of reminders for testing is probably associated with greater adherence to oral glucose tolerance testing up to 1 year postpartum but not random glucose testing or hemoglobin (Hb) A1c testing (moderate SoE).
 - For *general postpartum care* (2 NRCSs) and *screening* (1 RCT and 2 NRCSs), no conclusions are feasible because of insufficient evidence.
- **Healthcare Delivery Strategies – Use of Information or Communication Technology (IT)**
 - For *breastfeeding care* (7 RCTs), IT use and nonuse are probably associated with comparable rates of any breastfeeding at 3 months and 6 months and of exclusive breastfeeding at 3 months (all moderate SoE).
- **Healthcare Delivery Strategies – Interventions Targeting Healthcare Providers**
 - For *breastfeeding care* (2 RCTs), no conclusions are feasible because none of the prioritized outcomes were reported.
 - For *screening care* (1 RCT and 1 NRCS), no conclusions are feasible because of insufficient evidence.
- **Health Insurance – More comprehensive insurance** (28 NRCSs) is probably associated with greater attendance at postpartum visits (moderate SoE based on 11 NRCSs) and may be associated with fewer preventable readmissions and emergency room (ER) visits (low SoE based on 1 NRCS). There was insufficient evidence regarding symptoms or diagnoses of mental health conditions.



Background and Purpose

In recent decades, the United States has witnessed a considerable rise in maternal morbidity and mortality.¹ In 2020, the maternal mortality ratio was 23.8 per 100,000 live births (the highest among industrialized countries), with wide racial and ethnic gaps (e.g., non-Hispanic Black: 55.3 deaths per 100,000 live births, non-Hispanic White: 19.1, and Hispanic: 18.2).² Clinical practice guidelines (CPGs) that are explicitly evidence-based are needed to ensure that postpartum care is effective and meets the needs of postpartum individuals, their families, and the healthcare system. There are several important aspects

of postpartum care to examine, such as where care is provided (e.g., home, clinic), type of providers (e.g., obstetricians and gynecologists [OB/GYNs], midwives, doulas), managing postpartum care volume (e.g., optimal visit timing and frequency), and communication technology (e.g., telemedicine).

This systematic review aims to inform CPG developers, policymakers, and OB/GYNs, midwives, maternal-fetal medicine specialists, family medicine clinicians, primary care physicians, nurse practitioners, and other providers of care or support for postpartum individuals. The systematic review addresses two Key Questions (KQs) related to the comparative benefits and harms of: (1) alternative strategies for postpartum healthcare delivery and (2) extension of postpartum health insurance coverage.



Methods

We used methods consistent with those outlined in the Agency for Healthcare Research and Quality Evidence-based Practice Center Program Methods Guidance (<https://effectivehealthcare.ahrq.gov/topics/ceer-methods-guide/overview>). Our searches targeted comparative studies from database inception to November 16, 2022. To maximize applicability to the U.S. decision-making context, for KQ 1, we included studies conducted in the United States or Canada and for KQ 2, we included only U.S.-based studies. We extracted study data into the Systematic Review Data Repository Plus (SRDR+). Where there was sufficient evidence without an unacceptable amount of heterogeneity, we conducted pairwise meta-analyses. In the Results section of this Evidence Summary, we provide results only for outcomes that we prioritized with panels of key informants and technical experts and other outcomes for which we were able to conduct meta-analyses. We assessed the risk of bias and evaluated the SoE using standard methods. The PROSPERO protocol registration number is [CRD42022309756](https://www.crd42022309756).



Results

We found 92 primary studies comprising 3,967,261 participants in total. Eighty-three studies were conducted in the United States and 9 in Canada. The 92 studies included 50 RCTs (N = 477,954 participants) and 42 NRCSs (i.e., observational studies that compared 2 or more interventions; N = 3,489,307 participants).

Healthcare Delivery Strategies – Where Care Is Provided: We found 14 studies (12 RCTs and 2 NRCSs). For *general postpartum care* (6 studies), whether the visit was conducted at home/by telephone or at the clinic was associated with comparable depression and anxiety symptoms (low SoE) (Table A). There is insufficient evidence regarding attendance at postpartum visits, unplanned care utilization, and adherence to condition-specific screening or testing. For *breastfeeding care* (7 studies), whether the initial visit was conducted at home or at the pediatric clinic was associated with comparable depression symptoms (up to 6 months postpartum), anxiety symptoms (up to 2 months), hospital readmission by 3 months (summary relative risk [RR] 1.38, 95% confidence interval [CI] 0.90 to 2.13; 4 studies), or other unplanned care utilization (up to

2 months) (all low SoE). Meta-analysis was feasible only for the hospital readmission outcome. There is insufficient evidence regarding attendance at postpartum visits.

Healthcare Delivery Strategies – How Care Is Provided: We found seven studies (5 RCTs and 2 NRCSs). For *general postpartum care* (4 studies), integration of care (e.g., combined versus separate postpartum/well-child visits, multidisciplinary postpartum clinic versus standard care) may not have impacted depression symptoms or substance use up to 1 year (low SoE). There is insufficient evidence regarding attendance at postpartum visits and unplanned care utilization. For *contraceptive care* (1 study) and for *breastfeeding care* (2 studies), the studies did not address any of the prioritized outcomes.

Healthcare Delivery Strategies – When Care Is Provided: We found 12 studies (11 RCTs and 1 NRCS). For *general postpartum care* (3 studies), there is insufficient evidence regarding attendance at postpartum visits and unplanned care utilization. For *contraceptive care* (9 studies), compared with later contraception, earlier contraception was probably associated with comparable continued IUD use at 3 and 6 months but greater implant use at 6 months (summary RR 1.36, 95% CI 1.13 to 1.64; 2 RCTs) (all moderate SoE). There is insufficient evidence regarding mental health outcomes.

Healthcare Delivery Strategies – Who Provides Care: We found 28 studies (24 RCTs and 4 NRCSs). For *general postpartum care* (8 studies), there is insufficient evidence regarding postpartum visit attendance, hospital readmissions, and depression symptoms and diagnoses. For *contraceptive care* (1 study), the study did not address any prioritized outcome. For *breastfeeding care*, compared with no peer support, peer support was probably associated with higher rates of any breastfeeding at 1 month (summary effect size [ES] 1.13, 95% CI 1.03 to 1.24; 4 studies) and 3 to 6 months (summary ES 1.22, 95% CI 1.06 to 1.41; 4 studies) and of exclusive breastfeeding at 1 month (summary ES 1.10, 95% CI 1.02 to 1.19; 6 studies) but comparable rates of exclusive breastfeeding at 3 months and nonexclusive breastfeeding at 1 and 3 months (all moderate SoE). Compared with no lactation consultant, care by a lactation consultant was probably associated with higher rates of any breastfeeding (summary ES 1.23, 95% CI 0.90 to 1.69; 5 studies) and 6 months (summary ES 1.43, 95% CI 1.07 to 1.91; 3 studies) but not at 1 month or 3 months. Lactation consultant care was probably associated with comparable rates of exclusive breastfeeding at 1 or 3 months (all moderate SoE). For *preventive care* (2 studies), there is insufficient evidence regarding maternal mortality, depression symptoms, and major depression episodes.

Healthcare Delivery Strategies – Coordination and Management of Care: We found five studies (1 RCT and 4 NRCSs). For *screening/testing care* (3 studies of mail and/or telephone reminders), testing reminders were associated with greater adherence to oral glucose tolerance testing up to 1 year postpartum but not random glucose testing or HbA1c testing (moderate SoE). For *general postpartum care* (1 study of in-hospital provision of information regarding the first postpartum appointment), there is insufficient evidence regarding postpartum visit attendance.

Healthcare Delivery Strategies – Use of Information or Communication Technology (IT): We found eight studies (7 RCTs and 1 NRCS). For *breastfeeding care* (7 studies), IT use was probably associated with comparable rates of any breastfeeding at 3 months (summary RR 1.00, 95% CI 0.92 to 1.09; 3 RCTs) and 6 months (summary RR

1.01, 95% CI 0.89 to 1.14; 3 RCTs) and of exclusive breastfeeding at 3 months (summary RR 1.28, 95% CI 0.81 to 2.03; 4 RCTs) (all moderate SoE). There is insufficient evidence regarding postpartum visit attendance and depression symptoms. For *screening* (1 study), there is insufficient evidence regarding adherence to screening.

Healthcare Delivery Strategies – Interventions Targeting Healthcare Providers: We found two RCTs on electronic medical record (EMR) reminders for *breastfeeding care*. Neither study addressed any of the prioritized outcomes. We found one RCT and one NRCS on EMR reminders for *screening*. There is insufficient evidence regarding adherence to screening.

Health Insurance – We found 28 NRCSs. *More comprehensive insurance* was probably associated with greater attendance at postpartum visits (11 NRCSs; moderate SoE) and maybe associated with fewer preventable readmissions and ER visits (1 NRCS; low SoE). The evidence regarding symptoms or diagnoses of mental health conditions is insufficient.



Limitations

Although we found 64 studies for KQ 1, we were limited in our ability to make conclusions. This was largely because the studies addressed a range of aspects of postpartum care (general postpartum care, contraceptive care, breastfeeding care, and preventive care), and few studies reported the same outcomes addressing the same target of intervention. No study that reported subgroup data statistically evaluated whether the effect of the intervention differed among subgroups (i.e., heterogeneity of treatment effects). The included studies were mostly at moderate or high risk of bias. Many of the prioritized outcomes were either not reported in any included study for specific comparisons or were reported in an insufficient number of studies to allow meta-analyses or merit conclusions (i.e., they provided insufficient evidence).



Implications and Conclusions

Although we found 92 studies conducted in the United States or Canada, we were able to make few specific conclusions. Regarding *where* general postpartum care and breastfeeding care are provided, whether the initial visit is conducted at home or at the clinic may not impact mental health (depression symptoms up to 6 months postpartum or anxiety symptoms up to 2 months) or unplanned care utilization (hospital readmission by 3 months or other unplanned care utilization up to 2 months). Regarding *how* general postpartum care is provided, integration of care may not impact mental health (depression symptoms up to 1 year postpartum or substance use up to 2 years). Regarding *when* contraceptive care is provided, compared with later contraception, earlier contraception is probably associated with comparable continued IUD use at 3 and 6 months but greater implant use at 6 months. Regarding *who* provides breastfeeding care, compared with no peer support, peer support is probably associated with higher rates of any breastfeeding at 1 month and 3 to 6 months and of exclusive breastfeeding at 1 month but comparable

rates of exclusive breastfeeding at 3 months and nonexclusive breastfeeding at 1 and 3 months. Compared with no lactation consultant, breastfeeding care by a lactation consultant is probably associated with higher rates of any breastfeeding at 6 months but not at 1 month or 3 months. Lactation consultant care is probably associated with comparable rates of exclusive breastfeeding at 1 or 3 months. Regarding *health insurance coverage*, more comprehensive insurance is probably associated with greater attendance at postpartum visits and may be associated with fewer preventable readmissions and emergency room visits. Because we restricted study eligibility to those conducted in the United States or Canada, the overall findings of this review may not be broadly applicable beyond these countries.

Most studies included in this systematic review enrolled predominantly healthy postpartum individuals. Researchers should therefore design studies that, either entirely or in part, enroll individuals at high risk of postpartum complications due to chronic conditions, pregnancy-related conditions, or incident or newly diagnosed conditions. Moreover, most of the studies did not report information by subgroups of participants who may be vulnerable to poorer postpartum and long-term outcomes. Researchers should report separate data for such subpopulations, so that decision makers can identify postpartum care delivery strategies that work best for these populations, which could help close the wide and important gaps in health outcomes among the races of postpartum individuals in the United States. Future research should also specifically compare delivery strategies related to interventions targeting healthcare providers. In addition, future research should evaluate the impact of more comprehensive or extended health insurance on postpartum health. For all research questions, patient-reported outcomes, such as quality of life, should also be reported. Researchers should report separate data for various population subgroups, which could help close the wide and important gaps in health outcomes among the races of postpartum individuals in the United States.

Table A. Full summary of evidence identified in this systematic review

| Outcome Category | Outcome | KQ 1: Where Care Is Provided | KQ 1: How Care Is Provided | KQ 1: When Care Is Provided | KQ 1: Who Provides Care | KQ 1: Care Coordination/ Management | KQ 1: Information / Communication Technology | KQ 1: Interventions Targeting Providers | KQ 2: Health Insurance |
|------------------------|-------------------------------------|--|--|---|--|--|--|--|--|
| Healthcare utilization | Attendance at PP visits | ↑↓ General PP care (2 studies): No conclusion ? BF care (1 study): No conclusion | ? General PP care (1 study): No conclusion | ↑↓ General PP care (3 studies): No conclusion | ? General PP care (3 studies): No conclusion | ? General PP care (1 study): No conclusion | ? BF care (1 study): No conclusion | nd | ▲▲ More comprehensive insurance (11 studies): greater attendance |
| | Unplanned care utilization | ~ BF care (4 studies): Home vs. pediatric clinic Comparable hospital readmissions, other unplanned care ? General PP care (1 study): No conclusion | ? General PP care (2 studies): No conclusion | ? General PP care (1 study): No conclusion | ? General PP care (2 studies): No conclusion ? BF care (1 study): No conclusion | nd | nd | nd | ▲ More comprehensive insurance (1 study): Fewer preventable readmissions and ER visits |
| | Adherence to screening or testing | ? General PP care (1 study): No conclusion | nd | nd | nd | ▲▲ Screening/ Testing (3 studies): Reminders associated with greater adherence to OGTT up to 1 year PP but not random glucose or HbA1c testing | ? Screening (1 study): No conclusion | ↑↓ Screening care (2 studies): No conclusion | nd |
| | Transition to primary care provider | nd | ? General PP care (1 study): No conclusion | nd | nd | nd | nd | nd | nd |

| Outcome Category | Outcome | KQ 1: Where Care Is Provided | KQ 1: How Care Is Provided | KQ 1: When Care Is Provided | KQ 1: Who Provides Care | KQ 1: Care Coordination/ Management | KQ 1: Information / Communication Technology | KQ 1: Interventions Targeting Providers | KQ 2: Health Insurance |
|------------------|--------------------|--|---|---|--|-------------------------------------|--|---|--|
| Clinical | Maternal mortality | nd | nd | nd | ? BF care (1 study): No conclusion ? Preventive care (1 study): No conclusion | nd | nd | nd | nd |
| | Mental health | ~ General PP care (2 studies): Home/telephone vs. clinic: Comparable depression, anxiety symptoms ~ BF care (4 studies): Home vs. pediatric clinic: Comparable depression, anxiety symptoms | ~ General PP care (3 studies): Integrated vs. nonintegrated care: Comparable depression symptoms, substance use | ? Contraceptive care (1 study): No conclusion | ? General PP care (4 studies): No conclusion ? BF care (1 study): No conclusion ? Preventive care (1 study): No conclusion | nd | ? BF care (1 study): No conclusion | nd | ↑↓ More comprehensive insurance (3 studies): No conclusion |
| | Quality of life | nd | nd | nd | nd | nd | nd | nd | nd |
| | Perceived stress | nd | ? General PP care (1 study): No conclusion | nd | nd | nd | nd | nd | nd |
| | Contraceptive use | not prioritized (omitted) | not prioritized (omitted) | ▲▲ Earlier contraception (8 studies): comparable IUD use at 3 and 6 mo, but greater implant use at 6 mo | not prioritized (omitted) | not prioritized (omitted) | not prioritized (omitted) | not prioritized (omitted) | not prioritized (omitted) |

| Outcome Category | Outcome | KQ 1: Where Care Is Provided | KQ 1: How Care Is Provided | KQ 1: When Care Is Provided | KQ 1: Who Provides Care | KQ 1: Care Coordination/ Management | KQ 1: Information / Communication Technology | KQ 1: Interventions Targeting Providers | KQ 2: Health Insurance |
|------------------|--------------------------------|------------------------------|----------------------------|-----------------------------|--|-------------------------------------|---|---|---------------------------|
| | Breastfeeding | not prioritized (omitted) | not prioritized (omitted) | not prioritized (omitted) | ▲▲ Peer support for BF care (9 studies): any BF at 1 mo and 3-6 mo and exclusive BF at 1 mo, but comparable exclusive BF at 3 mo and non-exclusive BF at 1 and 3 mo ▲▲ LC for BF care (7 studies): any BF at 6 mo but not 1 mo or 3 mo. Comparable exclusive BF at 1 and 3 mo | not prioritized (omitted) | ~~ BF care (5 studies): Comparable any BF at 3 mo and 6 mo and exclusive BF at 6 mo | not prioritized (omitted) | not prioritized (omitted) |
| Harms | Health inequities | nd | nd | nd | nd | nd | nd | nd | nd |
| | Reported discrimination | nd | nd | nd | nd | nd | nd | nd | nd |

Abbreviations: BF = breastfeeding, HbA1c = hemoglobin A1c, IUD = intrauterine device, KQ = Key Question, LC = lactation consultant, mo = months, nd = no data, OGTT = oral glucose tolerance test, PP = postpartum.

▲ = Low SoE of better utilization or clinical outcomes, ▲▲ = Moderate SoE of better utilization or clinical outcomes, ▲▲▲ = High SoE of better utilization or clinical outcomes (no instances in this table)

~ = Low SoE of comparable outcomes, ~~ = Moderate SoE of comparable outcomes, ~~~ = High SoE of comparable outcomes (no instances in this table)

? = Insufficient strength of evidence due to sparse evidence, ↑↓ = Insufficient strength of evidence due to inconsistent or conflicting results

Note that the number of studies indicated in specific cells refers to the number of studies that reported data for the outcome and delivery strategy comparison in that cell.

Color legend: Insufficient strength of evidence (gray), Low strength of evidence (pink), Moderate strength of evidence (blue), High strength of evidence (green) (no instances in this table). The colors do not provide unique information compared with the text and symbols.



References

1. Petersen EE, Davis NL, Goodman D, et al. Racial/Ethnic Disparities in Pregnancy-Related Deaths - United States, 2007-2016. *MMWR Morb Mortal Wkly Rep.* 2019 Sep 6;68(35):762-5. doi: 10.15585/mmwr.mm6835a3. PMID: 31487273.
2. Centers for Disease Control and Prevention National Center for Health Statistics. Maternal Mortality Rates in the United States. 2020. Atlanta, Georgia. <https://www.cdc.gov/nchs/data/hestat/maternal-mortality/2020/maternal-mortality-rates-2020.htm>. Accessed on October 25, 2022.

Full Report

Saldanha IJ, Adam GP, Kanaan G, Zahradnik ML, Steele DW, Danilack VA, Peahl AF, Chen KK, Stuebe AM, Balk EM. Postpartum Care up to 1 Year After Pregnancy: A Systematic Review and Meta-Analysis. Comparative Effectiveness Review No. 261. (Prepared by the Brown Evidence-based Practice Center under Contract No. 75Q80120D00001.) AHRQ Publication No. 23-EHC010. PCORI Publication No. 2023-SR-01. Rockville, MD: Agency for Healthcare Research and Quality; June 2023.
DOI: <https://doi.org/10.23970/AHRQEPCCER261>. Posted final reports are located on the Effective Health Care Program [search page](#).

