



Centering Pregnancy and Centering Parenting Annotated Bibliography

September 2022

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Pre-Term Birth/Low Birth Weight

Abshire C, Mcdowell M, Crockett AH, Fleischer NL. (2019). **The Impact of CenteringPregnancy Group Prenatal Care on Birth Outcomes in Medicaid Eligible Women.** *Journal of Women's Health* 28(7), 919-928.

- **Summary:** This is a quantitative study that compares outcomes in group prenatal care and traditional prenatal care. It concludes that women and birthing person in group prenatal care had lower risks of PTB, sPTB, LBW and NICU admissions.
- **Results:** “The analysis included 1,292 women in GPNC and 8,703 in traditional individual prenatal care (IPNC). After controlling for potential confounders, the risk of PTB (risk ratio [RR] 0.38; 95% confidence interval [CI] 0.31–0.47), sPTB (RR 0.49; 95% CI 0.38–0.63), LBW (RR 0.46; 95% CI 0.37–0.56), and NICU admissions (RR 0.46; 95% CI 0.37–0.57) was lower in GPNC compared to IPNC women. Results differed by maternal race/ethnicity, with the strongest associations among non-Hispanic white mothers and the weakest associations among Hispanic mothers, especially for sPTB. Similarly, the risk of PTB, LBW, and NICU admissions was lower among GPNC women who attended more than five sessions.”
- **Conclusion:** “Participation in GPNC demonstrated a decreased risk for sPTB, as well as other adverse birth outcomes. In addition, participation in more than five PNC sessions demonstrated a decreased risk for adverse birth outcomes. Prospective longitudinal studies are needed to further explore mechanisms associated with these findings.”

Crockett AH, Heberlein EC, Smith JC, Ozluk P, Covington-Kolb S, & Willis C. (2019). **Effects of a Multi-site Expansion of Group Prenatal Care on Birth Outcomes.** *Maternal and Child Health Journal.*

- **Summary:** This is a quantitative study that compared women and birthing person in traditional prenatal care and CenteringPregnancy and concluded that those in CenteringPregnancy were less likely to have preterm births, low birth weight births, and NICU admissions.
- **Results:** “In the intent-to-treat analyses, women who received group prenatal care were significantly less likely to have preterm births (absolute risk difference – 3.2%, 95% CI – 5.3 to – 1.0%), low birth weight births (absolute risk difference – 3.7%, 95% CI – 5.5 to – 1.8%) and NICU admissions (absolute risk difference – 4.0%, 95% CI – 5.6 to – 2.3%). In the as-treated analyses, women had greater improvements compared to intent-to-treat analyses in preterm birth and low birth weight outcomes.”
- **Conclusions for Practice:** “CenteringPregnancy group prenatal care is effective across a range of real-world clinical practices for decreasing the risk of preterm birth and low birth weight. This is a feasible approach for other Perinatal Quality Collaboratives to attempt in their ongoing efforts at improving maternal and infant health outcomes.”

Crockett, A. H., Chen, L., Heberlein, E. C., Britt, J. L., Covington-Kolb, M. S., Witrick, M. B., Doherty, M. E., Zhang, L., Borders, A., Keenan-Devlin, L., Smart, M. B., & Heo, M. (2022). **Group versus traditional prenatal care for improving racial equity in preterm birth and low birthweight: the Cradle randomized clinical trial study**. *American Journal of Obstetrics and Gynecology*.

- **Summary:** There are significant maternal health disparities between Black and white women in the United States. This study seeks to investigate whether group prenatal care has an effect on preterm birth and low birthweight disparities.
- **Results:** This is a randomized control trial among low-risk pregnant patients at a single site. A total of 2350 participants were randomly assigned to group prenatal care (n=1176) or individual prenatal care (n=1174). Study population was 40.5% Black, 21.4% Hispanic, and 36.8% white and 1.3% other races or ethnicities. The outcomes being investigated were preterm birth before 37 week gestation, and low birthweight below 2500g.
- **Conclusions:** There was no difference in the overall preterm birth rates or low birthweight between group and individual prenatal care. However, with increased participation in group prenatal care, lower rates of preterm birth and low birthweight were observed in Black participants.

Cunningham SD, Lewis JB, Shebl FM, Boyd LM, Robinson MA, Grilo SA, Ickovics JR. (2018). **Group Prenatal Care Reduces Risk of Preterm Birth and Low Birth Weight: A Matched Cohort Study**. *Journal of Women's Health*, 28(1), 17-22.

- **Summary:** This is a quantitative study comparing women and birthing person in traditional prenatal care and group prenatal care that concludes that those in group prenatal care had significantly lower risk of preterm births and low birth weight babies.
- **Results:** "Controlling for individual visits, receiving group prenatal care resulted in significantly lower risk of having a preterm birth (Rate ratio [RR] 0.63, 95% confidence interval [CI] 0.49–0.81) and low birth weight baby (RR 0.62, 95% CI 0.47–0.81), compared to receiving individual care only. Women with \pm 5 group prenatal care visits experienced even greater benefits: 68% (RR= 0.32; 95% CI 0.22–0.45) and 66% (RR= 0.34; 95% CI 0.23–0.50) risk reduction in preterm birth and low birth weight, respectively."
- **Conclusions:** "Participation in group prenatal care may improve birth outcomes. Efforts to promote adoption and sustainability of group prenatal care by health systems may be warranted."

“CenteringPregnancy group prenatal care is effective across a range of real-world clinical practices for decreasing the risk of preterm birth and low birth weight.”

Crockett, et al.

Gareau, S., Lòpez-De Fede, A., Loudermilk, B. L., Cummings, T. H., Hardin, J. W., Picklesimer, A. H., & Covington-Kolb, S. (2016). **Group Prenatal Care Results in Medicaid Savings with Better Outcomes: A Propensity Score Analysis of CenteringPregnancy Participation in South Carolina.** *Maternal and Child Health Journal*, 1-10.

- **Summary:** This is a retrospective quantitative study of outcomes of 1262 participants in CenteringPregnancy. It found that CenteringPregnancy participants had lower risks of premature birth, NICU stays, and LBW infants.
- **Results:** “This study estimated that CenteringPregnancy participation reduced the risk of premature birth (36 %, P\0.05). For every premature birth prevented, there was an average savings of \$22,667 in health expenditures. Participation in CenteringPregnancy reduced the incidence of delivering an infant that was LBW (44 %, P\0.05, \$29,627). Additionally, infants of CenteringPregnancy participants had a reduced risk of a NICU stay (28 %, P\0.05, \$27,249). After considering the state investment of \$1.7 million, there was an estimated return on investment of nearly \$2.3 million.”
- **Conclusions:** “Cost savings were achieved with better outcomes due to the participation in CenteringPregnancy among low-risk Medicaid beneficiaries.”

Ickovics JR, Kershaw T, Westdahl C, Magriples U, Massey Z, Reynolds H, Rising, S. (2007). **Group Prenatal Care and Perinatal Outcomes: A randomized controlled trial.** *Obstetrics and Gynecology*, 110(2), Part 1: 330-39.

- **Summary:** This is a quantitative study of women and birthing person participating in CenteringPregnancy that found that CenteringPregnancy participants were at lower risk of preterm births and reported feeling more prepared than those in traditional prenatal care.
- **Results:** “Mean age of participants was 20.4 years; 80% were African American. Using intent-to-treat analyses, women assigned to group care were significantly less likely to have preterm births compared with those in standard care: 9.8% compared with 13.8%, with no differences in age, parity, education, or income between study conditions. This is equivalent to a

risk reduction of 33% (odds ratio 0.67, 95% confidence interval 0.44-0.99, P=.045), or 40 per 1,000 births. Effects were strengthened for African-American women: 10.0% compared with 15.8% (odds ratio 0.59, 95% confidence interval 0.38-0.92, P=.02). Women in group sessions were less likely to have suboptimal prenatal care (P<.01), had significantly better prenatal knowledge (P<.001), felt more ready for labor and delivery (P<.001), and had greater satisfaction with care (P<.001). Breastfeeding initiation was higher in group care: 66.5% compared with 54.6%, P<.001. There were no differences in birth weight nor in costs associated with prenatal care or delivery.”

- **Conclusions:** “Group prenatal care resulted in equal or improved perinatal outcomes at no added cost.”

Klima C, Norr K, Vonderheid S, Handler A. (2009) **Introduction of CenteringPregnancy in a Public Health Clinic.** *Journal of Midwifery & Women’s Health*, 54 (1): 27-34.

- **Summary:** This is a quantitative showing that women and birthing person in the CenteringPregnancy group had infants who were born at a later mean gestational age (35.6 vs. 34.8 wks) and were nearly 200 g heavier (2486 vs. 2292 g) on average.
- **Results:** “Women in CenteringPregnancy attended significantly more prenatal visits (9.7 vs. 8.3) and gained significantly more weight during pregnancy (32.2 lbs vs. 28.5 lbs; P.05). Women in CenteringPregnancy were significantly more likely to have initiated at least some breastfeeding during hospitalization (59% vs. 44%; P.05). Forty Four percent were exclusively breastfeeding at hospital discharge, compared to only 31.2% of the women in individual care (Table 2). There were eight premature births in the CenteringPregnancy group (13.1%) and 23 premature births in the individual care group (11%). Health outcomes were examined separately for women whose infants were born prematurely to provide important descriptive information. Women in the CenteringPregnancy group had infants who were born at a later mean gestational age (35.6 vs. 34.8 wks) and were nearly 200 g heavier (2486 vs. 2292 g) on average. Of the eight mothers of premature infants in CenteringPregnancy, six (75%) breastfed their infant, compared to only five (26%) of the 19 mothers receiving individual care for whom data were available.”
- **Conclusions:** “This pilot project demonstrated that CenteringPregnancy can be implemented in a busy public health clinic serving predominantly low-income pregnant women and is associated with positive health outcomes.”

Novick G, Reid A, Lewis J, Kershaw T, Rising SS, Ickovics J. (2013) **Group prenatal care: model fidelity and outcomes.** *American Journal of Obstetrics & Gynecology*, 209(2). 112.e1-112.e6.
<http://doi.org/10.1016/j.ajog.2013.03.026>

- **Summary:** This is a quantitative study of 519 CenteringPregnancy participants that found that greater fidelity to the CenteringPregnancy model resulted in decreased odds of preterm birth and intensive utilization of care.
- **Results:** “Controlling for important clinical predictors, greater process fidelity was associated with significantly lower odds of both preterm birth ($B = -0.43$, Wald $\chi^2 = 8.65$, $P = .001$) and intensive utilization of care ($B = -0.29$, Wald $\chi^2 = 3.91$, $P = .05$). Greater content fidelity was associated with lower odds of intensive utilization of care ($B = -0.03$, Wald $\chi^2 = 9.31$, $P = .001$).”
- **Conclusions:** “Maintaining fidelity to facilitative group processes in CenteringPregnancy was associated with significant reductions in preterm birth and intensive utilization of care. Content fidelity also was associated with reductions in intensive utilization of care. Clinicians learning to facilitate group care should receive training in facilitative leadership, emphasizing the critical role that creating a participatory atmosphere can play in improving outcomes.”

Picklesimer A., Billings D., Hale J., Blackhurst, D., and Covington-Kolb, S. (2012). **The effect of CenteringPregnancy group prenatal care on preterm birth in a low-income population.** *American Journal of Obstetrics & Gynecology* Vol 206: 415. e1-7.

- **Summary:** This is a quantitative study that found that participation in CenteringPregnancy reduced the likelihood of preterm birth.
- **Results:** “Risk factors for preterm birth were similar for group prenatal care vs traditional prenatal care: smoking (16.9% vs 20%; $P = .17$), sexually transmitted diseases (15.8% vs 13.7%; $P = .29$), and previous preterm birth (3.2% vs 5.4%; $P = .08$). Preterm delivery (<37 weeks' gestation) was lower in group care than traditional care (7.9% vs 12.7%; $P = .01$), as was delivery at <32 weeks' gestation (1.3% vs 3.1%; $P = .03$). Adjusted odds ratio for preterm birth for participants in group care was 0.53 (95% confidence interval, 0.34–0.81). The racial disparity in preterm birth for black women, relative to white and Hispanic women, was diminished for the women in group care.”
- **Conclusions:** “Among low-risk women, participation in group care improves the rate of preterm birth compared with traditional care, especially among black women. Randomized studies are needed to eliminate selection bias.”

Smith, Adrienne M., Mehak; and Lian, Brad (2020) "**Effects of CenteringPregnancy on Pregnancy Outcomes and Health Disparities in Racial Groups versus Traditional Prenatal Care,**" Journal of the Georgia Public Health Association: Vol. 8 : No. 1 , Article 8. DOI: 10.20429/jgpha.2020.080108

- **Summary:** This is a study analyzing women who took part in CenteringPregnancy that concludes African American mothers saw particular benefits from CenteringPregnancy.
- **Methods:** "A retrospective cohort study was conducted to examine differences with respect to several pregnancy outcomes such as low birth weight."
- **Results:** "There were no statistically significant differences between the groups on pregnancy outcomes. When the groups were stratified by race/ethnicity, however, African American mothers saw some benefit from CenteringPregnancy with their babies being born, on average, one week later ($p=0.04$) and having fewer NICU admittances ($p=0.04$) than their African American counterparts receiving traditional care."
- **Conclusion:** "The CenteringPregnancy group prenatal care program may be especially valuable for African American mothers and may help reduce racial/ethnic disparities with respect to important pregnancy outcomes. Our results have implications that full adoption of CenteringPregnancy in clinical practice at the Anderson Clinic will better service communities of mothers who are underserved, at-risk and vulnerable."

NICU Admissions

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“For every premature birth prevented, there was an average savings of \$22,667 in health expenditures. ”

Gareau, et al.

Crockett, Amy, et al. (2016) **Investing in CenteringPregnancy™ Group Prenatal Care Reduces Newborn Hospitalization Costs.** *Women's Health Issues.*

- **Summary:** This is an analysis of the costs of a CenteringPregnancy Medicaid pilot program that concludes that CenteringPregnancy reduced costs compared to traditional prenatal care.
- **Results:** “Of the CenteringPregnancy newborns, 3.5% had a NICU admission compared with 12.0% of individual care newborns ($p < .001$). Investing in CenteringPregnancy for 85 patients

(\$14,875) led to an estimated net savings for the managed care organization of \$67,293 in NICU costs.”

- **Conclusions:** “CenteringPregnancy may reduce costs through fewer NICU admissions. Enhanced reimbursement from payers to obstetric practices supporting CenteringPregnancy sustainability may improve birth outcomes and reduce associated NICU costs.”

Crockett AH, Heberlein EC, Smith JC, Ozluk P, Covington-Kolb S, & Willis C. (2019). **Effects of a Multi-site Expansion of Group Prenatal Care on Birth Outcomes.** *Maternal and Child Health Journal.*

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- **Conclusion:** “The CenteringPregnancy group prenatal care program may be especially valuable for African American mothers and may help reduce racial/ethnic disparities with respect to important pregnancy outcomes. Our results have implications that full adoption of CenteringPregnancy in clinical practice at the Anderson Clinic will better service communities of mothers who are underserved, at-risk and vulnerable.”

Greater Readiness for Birth and Infant Care

Boothe, E., Olenderek, M., Noyola, M.C. et al. (2021) **Psychosocial outcomes of group prenatal care.** *Journal of Public Health.* <https://doi.org/10.1007/s10389-020-01441-6>

- **Summary:** This is a study comparing Pregnancy Knowledge Scores and Edinburgh Postnatal Depression Scale scores in women and birthing person in CenteringPregnancy with those not in CenteringPregnancy. It concludes that the group enrolled in CenteringPregnancy had significantly higher Pregnancy Knowledge Scores.
- **Results:** “The majority (64%) of primiparous women chose CenteringPregnancy® ($\chi^2 = 8.6399$, $df = 2$, $p = 0.003$). A significant increase in Pregnancy Knowledge Scale (PKS) scores was observed in the CenteringPregnancy® group ($p = 0.0278$). Women in both groups revealed no significant difference in depression scores, as measured by the Edinburgh Postnatal Depression Scale (EPDS).”
- **Conclusions:** “Our research adds support to current literature suggesting group prenatal care is equivalent to, and perhaps more beneficial (in certain psychosocial arenas) than traditional prenatal care.”

Hackley B, Elyachar-Stahl E, Savage AK, Stange M, Hoffman A, Kavanaugh M, Aviles MM, Arévalo S, Machuca H, and Alan Shapiro. (2018). **A Qualitative Study of Women's Recall of Content and Skills Developed in Group Prenatal and Well-Baby Care 2 Years Later.** *Journal of Midwifery & Women's Health* 64(2), 209-216.

- **Summary:** This is a study that analyzed the recall of content two years after group prenatal and well-baby care and found significant recall.
- **Methods:** “Eligible women participated in group prenatal and/or well-baby care between 2008 and 2012, were aged at least 18 years, and were English-speaking. Of the 127 eligible women, 32 were reached and 17 agreed to participate. Women were interviewed on average 3 years after group prenatal or well-baby care ended using a semistructured interview guide. Transcripts were reviewed and coded by each team member. Final codes and themes were identified using an iterative review process among the research team.”
- **Results:** “Three themes were identified: sustained change, transferable skills, and group as a safe haven. All women were still using strategies discussed during group and had made sustained improvements in nutrition, stress management, and/or in the quality of their interactions with their children, partner, or families. The group environment was described as a safe haven: a respectful, nonjudgmental space that allowed women to share and support each other while learning new skills.”

- **Discussion:** “This is the first study to document that group prenatal and well-baby care is associated with long-term benefits in areas not yet reported in the literature: nutrition, family communication, and parenting.”



Ickovics JR, Kershaw T, Westdahl C, Magriples U, Massey Z, Reynolds H, Rising, S. (2007). **Group Prenatal Care and Perinatal Outcomes: A randomized controlled trial. *Obstetrics and Gynecology*,110(2), Part 1: 330-39.**

- **Summary:** This is a quantitative study of women and birthing person participating in CenteringPregnancy that found that CenteringPregnancy participants were at lower risk of preterm births and reported feeling more prepared than those in traditional prenatal care.
- **Results:** “Mean age of participants was 20.4 years; 80% were African American. Using intent-to-treat analyses, women assigned to group care were significantly less likely to have preterm births compared with those in standard care: 9.8% compared with 13.8%, with no differences in age, parity, education, or income between study conditions. This is equivalent to a risk reduction of 33% (odds ratio 0.67, 95% confidence interval 0.44-0.99, P=.045), or 40 per 1,000 births. Effects were strengthened for African-American women: 10.0% compared with 15.8% (odds ratio 0.59, 95% confidence interval 0.38-0.92, P=.02). Women in group sessions were less likely to have suboptimal prenatal care (P<.01), had significantly better prenatal knowledge (P<.001), felt more ready for labor and delivery (P<.001), and had greater satisfaction with care (P<.001). Breastfeeding initiation was higher in group care: 66.5% compared with 54.6%, P<.001. There were no differences in birth weight nor in costs associated with prenatal care or delivery.”
- **Conclusions:** “Group prenatal care resulted in equal or improved perinatal outcomes at no added cost.”

Reproductive Health Outcomes

Hale N, Picklesimer AH, Billings DL, Covington-Kolb, S. "The impact of Centering Pregnancy Group Prenatal Care on postpartum family planning." *American Journal of Obstetrics and Gynecology* 210.1 (2014): 50.e1-50.e7.

- **Summary:** This is a retrospective cohort study that found that utilization of postpartum family-planning services was higher among women and birthing person participating in GPNC than among women receiving IPNC at 4 points in time postpartum: 3 months (7.72% vs 5.15%, $P < .05$) 6 months (22.98% vs 15.10%, $P < .05$) 9 months (27.02% vs 18.42%, $P < .05$), and 12 months (29.30% vs 20.38%, $P < .05$).
- **Results:** "Utilization of postpartum family-planning services was higher among women participating in GPNC than among women receiving IPNC at 4 points in time: 3 (7.72% vs 5.15%, $P < .05$), 6 (22.98% vs 15.10%, $P < .05$), 9 (27.02% vs 18.42%, $P < .05$), and 12 (29.30% vs 20.38%, $P < .05$) months postpartum. Postpartum family-planning visits were highest among non-Hispanic black women at each interval, peaking with 31.84% by 12 months postpartum. After propensity score matching, positive associations between GPNC and postpartum family-planning service utilization remained consistent by 6 (odds ratio [OR], 1.42; 95% confidence interval [CI], 1.05-1.92), 9 (OR, 1.43; 95% CI, 1.08-1.90), and 12 (OR, 1.44; 95% CI, 1.10-1.90) months postpartum."
- **Conclusion:** "These findings demonstrate the potential that GPNC has to positively influence birthing person and women's health outcomes after pregnancy and to improve the utilization rate of preventive health services. Utilization of postpartum family-planning services was highest among non-Hispanic black women, further supporting evidence of the impact of GPNC in reducing health disparities. However, despite continuous Medicaid enrollment, postpartum utilization of family-planning services remained low among all women, regardless of the type of prenatal care they received."

Heberlein, E. C., Smith, J. C., LaBoy, A., Britt, J., & Crockett, A. (2021). **Birth Outcomes for Medically High-Risk Pregnancies: Comparing Group to Individual Prenatal Care.** *American journal of perinatology*, 10.1055/a-1682-2704. Advance online publication. <https://doi.org/10.1055/a-1682-2704>

- **Summary:** This retrospective cohort study uses vital statistics data to compare pregnancy outcomes for women and birthing person from 21 obstetric practices participating in a statewide expansion project of group prenatal care in South Carolina. This study provides preliminary evidence that women who have or develop common medical complications during pregnancy have similar or lower risks for preterm birth, low birth weight, or NICU admissions if they participate in group prenatal care. This evidence can support prenatal care providers in confidently establishing more inclusive criteria for group care.

- **Results:** The study population for this paper included women and birthing person with pregestational or gestational hypertension, pregestational or gestational diabetes, and high body mass index (BMI > 45 kg/m²). Patients were matched using propensity scoring, and outcomes were compared using logistic regression. Two levels of treatment exposure based on group visit attendance were evaluated for women in group care: any exposure (one or more groups) or minimum threshold (five or more groups). Participation in group prenatal care at either treatment exposure level was associated with a lower risk of neonatal intensive care unit (NICU) admissions (10.2 group vs. 13.8% individual care, odds ratio [OR] 1/4 0.708, p < 0.001). Participating in the minimum threshold of groups (five or more sessions) was associated with reduced risk of preterm birth (11.4% group vs. 18.4% individual care, OR 1/4 0.569, p < 0.001) and NICU admissions (8.4% group vs. 15.9% individual care, OR 1/4 0.483, p < 0.001). No differences in birth weight were observed.
- **Conclusion:** This study provides preliminary evidence that women and birthing person who have or develop common medical conditions during pregnancy are not at greater risk for preterm birth, low birth weight, or NICU admissions if they participate in group prenatal care. Practices who routinely exclude patients with these conditions from group participation should reconsider increasing inclusivity of their groups. Increasing early and regular access to traditional prenatal care has had limited or no impact on preterm birth, low birth weight, and disparities in birth outcomes, whereas greater exposure to group care has resulted in better outcomes. Group prenatal care is favorably received by pregnant people and should continue to be on the policy agenda.

Lewis, J. B., Cunningham, S. D., Shabanova, V., Hassan, S. S., Magriples, U., Rodriguez, M. G., & Ickovics, J. R. (2021). **Group prenatal care and improved birth outcomes: Results from a type 1 hybrid effectiveness-implementation study.** *Preventive medicine*, 153, 106853. <https://doi.org/10.1016/j.ypmed.2021.106853>

Summary: This is a type 1 hybrid effectiveness-implementation trial comparing birth outcomes between patients receiving Expect With Me (EWM) group prenatal care (N 577) and individual prenatal care (N 1825). The four primary outcomes measures were preterm birth (<37 weeks gestation), low birth weight (<2500g), admission to NICU, and small for gestational age (<10% percentile weight for gestational age).

Results: Mean participant age was 27.1, 49.5% were Black, 15.3% were Latina, and 59.7% were publicly insured. Augmented inverse probability weighting (AIPW) was used to compare outcomes between groups. Patients in group care (EWM) did significantly better on three of the four measured outcomes. Preterm birth results were 6.4% in group care versus 15.1% in individual care; low birth weight was 4.3% in group care versus 11.6% in individual care; and admission to NICU was 9.4% in group care versus 14.6% in individual care. No significant difference was found between groups for having a small for gestational age baby.

Conclusion: Patients who participated in group prenatal care effectively reduced risk of preterm birth by 58%, 63% reduction in the risk of low birth weight, and 37% reduction in NICU admissions. Further research is needed to explore the mechanisms by which group prenatal care reduces adverse outcomes, best practice implementation, and health system savings.

Patberg E, Young M, Archer S, Duininck G, Li J, Blackwell C, Lathrop E, and Haddad L. (2020). **Postpartum Contraceptive Use and Other Reproductive Health Outcomes Among CenteringPregnancy Group Prenatal Care Participants.** *Journal of Women's Health* 2020.

- **Summary:** This is a quantitative study comparing contraceptive use between women and birthing person in traditional prenatal care and CenteringPregnancy. It concludes that CenteringPregnancy participants were more likely to choose Long-Acting Reversible Contraception.
- **Results:** “One quarter of women (26%) chose LARC for postpartum contraception. There was no difference in overall contraceptive uptake between CenteringPregnancy and traditional PNC groups. CenteringPregnancy participants were 70% more likely to use LARC postpartum compared with women receiving traditional PNC (adjusted relative risk [aRR] 1.76; $p < 0.01$). CenteringPregnancy participants were significantly more likely to initiate breastfeeding before hospital discharge (aRR 1.14, $p = 0.01$) and to report exclusive breastfeeding at the postpartum visit (relative risk [RR] 2.54; $p < 0.01$). Women in the CenteringPregnancy group were marginally more likely to report any breastfeeding at the postpartum visit and to attend the postpartum visit (RR 1.31, $p = 0.05$ and RR 1.17, $p = 0.05$ respectively), but were no less likely to have a rapid repeat pregnancy (RR 0.90, $p = 0.57$).”
- **Conclusions:** “Women in CenteringPregnancy groups had increased uptake of LARC compared with a similar cohort of women in traditional PNC. Other potential benefits of CenteringPregnancy, including breastfeeding and attendance at the postpartum visit require further study.”

Higher Breastfeeding Rates

Patberg E, Young M, Archer S, Duinick G, Li J, Blackwell C, Lathrop E, and Haddad L. (2020). **Postpartum Contraceptive Use and Other Reproductive Health Outcomes Among CenteringPregnancy Group Prenatal Care Participants.** *Journal of Women's Health* 2020.

- **Summary:** This is a quantitative study comparing contraceptive use between women and birthing person in traditional prenatal care and CenteringPregnancy. It concludes that CenteringPregnancy participants were more likely to choose Long-Acting Reversible Contraception.
- **Results:** “One quarter of women (26%) chose LARC for postpartum contraception. There was no difference in overall contraceptive uptake between CenteringPregnancy and traditional PNC groups. CenteringPregnancy participants were 70% more likely to use LARC postpartum compared with women receiving traditional PNC (adjusted relative risk [aRR] 1.76; $p < 0.01$). CenteringPregnancy participants were significantly more likely to initiate breastfeeding before hospital discharge (aRR 1.14, $p = 0.01$) and to report exclusive breastfeeding at the postpartum visit (relative risk [RR] 2.54; $p < 0.01$). Women in the CenteringPregnancy group were marginally more likely to report any breastfeeding at the postpartum visit and to attend the postpartum visit (RR 1.31, $p = 0.05$ and RR 1.17, $p = 0.05$ respectively), but were no less likely to have a rapid repeat pregnancy (RR 0.90, $p = 0.57$).”
- **Conclusions:** “Women in CenteringPregnancy groups had increased uptake of LARC compared with a similar cohort of women in traditional PNC. Other potential benefits of CenteringPregnancy, including breastfeeding and attendance at the postpartum visit require further study.”

Roussos-Ross K, O'Shea T, & Ramos M. (2017). **An Observational Study of the Complementary Pregnancy Outcomes of Patients Enrolled in CenteringPregnancy.** *Journal of Gynecology & Obstetrics* 1(3), e001.

- **Summary:** This study compared women and birthing person in CenteringPregnancy to the general population and concludes that CenteringPregnancy improved outcomes in breastfeeding, immunization, and contraception.
- **Materials and Methods:** “Eighty-five women receiving CP care within an academic institution, who delivered between September 2015 and May 2016 were included for analysis.”
- **Results:** “The breastfeeding initiation rate was 96.5%. The postpartum breastfeeding continuation rate was 62%. Influenza vaccination rate was 67% and Tdap vaccination rate

was 68%. Contraceptive initiation rates were 72% overall, with 25% electing LARC. Finally, the preterm delivery rate in the study population was 10.6%.”

- **Conclusion:** “This study demonstrated higher than expected rates of breastfeeding initiation and continuation, immunization rates, and contraceptive rates- specifically LARC. The preterm delivery rate of this study population was similar to traditional care within this community. CenteringPregnancy offers complementary benefits to the health of women and infants outside of the previously reported Centering outcomes.”

Tanner-Smith E, Steinka-Fry K, Lipsey M. (2013) **Effects of CenteringPregnancy Group Prenatal Care on Breastfeeding Outcomes.** *Journal of Midwifery & Women’s Health* 1526-9523/09

- **Summary:** This is a quasi-experimental quantitative study that concluded that women and birthing person who participated in CenteringPregnancy had higher odds of breastfeeding than those who did not.
- **Results:** “Compared with the matched comparison group of women receiving prenatal care in an individual format, women in CenteringPregnancy group prenatal care had significantly higher odds of any breastfeeding at discharge (odds ratio [OR], 2.08; 95% confidence interval [CI], 1.32-3.26; P .001). Across the 4 sites, there were no consistent differences in the odds of any breastfeeding at follow-up or exclusive breastfeeding at discharge or postpartum follow-up.
- **Discussion:** “CenteringPregnancy group prenatal care may have beneficial effects on initial rates of breastfeeding relative to individually delivered care. However, there is not sufficient evidence to conclude that CenteringPregnancy group prenatal care has robust effects on exclusive breastfeeding at discharge or postpartum follow-up.”

Zielinski, R., Stork, L., Deibel, M., Kothari, C. L., & Searing, K. (2014). **Improving Infant and Maternal Health through CenteringPregnancy: A Comparison of Maternal Health Indicators and Infant Outcomes between Women Receiving Group versus Traditional Prenatal Care.** *Open Journal of Obstetrics and Gynecology*, 4(9), 497–505.

- **Summary:** This is a retrospective study that analyzed participants in CenteringPregnancy at two sites and found that CenteringPregnancy participants had higher rates of smoking cessation and breastfeeding.
- **Results:** “There were no significant differences in pre-pregnancy weight, amount of weight gained during pregnancy, prenatal care attendance, gestational age at delivery, mode of delivery or infant birth weight. The CenteringPregnancy group had significantly higher rates of smoking cessation during pregnancy, as well as higher rates of breastfeeding initiation and continuation.”

- Conclusions: “This study provides support for the benefits of CenteringPregnancy in improving rates of smoking cessation during pregnancy which is important to both maternal and infant health. Additionally, in this population CenteringPregnancy resulted in improved rates of breastfeeding initiation and continuation, providing benefits to both infants and mothers.”

Participant Satisfaction

Coker TR, Chung PJ, Cowgill BO, Chen L, and Rodriguez MA. (2009) **Low-Income Parents' Views on the Redesign of Well-Child Care.** *Pediatrics*; 124(1): 194-204.

- **Summary:** This is a qualitative study based on interviews of low-income parents.
- **Results:** “Parents were mostly mothers (91%), nonwhite (64% Latino, 16% black), and 30 years of age (66%) and had an annual household income of \$35 000 (96%). Parents reported substantial problems with WCC, focusing largely on limited provider access (especially with respect to scheduling and transportation) and inadequate behavioral/ developmental services. Most parents endorsed nonphysician providers and alternative locations and formats as desirable adjuncts to usual physician-provided, clinic-based WCC. Nonphysician providers were viewed as potentially more expert in behavioral/developmental issues than physicians and more attentive to parent-provider relationships. Some alternative locations for care (especially home and day care visits) were viewed as creating essential context for providers and dramatically improving family convenience. Alternative locations whose sole advantage was convenience (eg, retail-based clinics), however, were viewed more skeptically. Among alternative formats, group visits in particular were seen as empowering, turning parents into informal providers through mutual sharing of behavioral/developmental advice and experiences.”
- **Conclusions:** “Low-income parents of young children identified major inadequacies in their WCC experiences. To address these problems, they endorsed a number of innovative reforms that merit additional investigation for feasibility and effectiveness.”

DeLago C, Dickens B, Phipps E, Paoletti A, Kazmierczak M, Irigoyen M. (2018) **Qualitative Evaluation of Individual and Group Well-Child Care.** *Academic Pediatrics* 18(5): 516-524.

- **Summary:** This is a mixed method study analyzing patient impressions of CenteringParenting. Patients reported social and wellness benefits to participating in CenteringParenting.
- **Results:** “Both groups had similar demographics: parents were mostly female (91%) and black (>80%); about half had incomes < \$20,000. Parents’ mean age was 27 years; children’s mean age was 11 months. There were no significant differences in overall scores measuring trust in physicians, parent empowerment, or stress. IWC parents’ themes highlighted ways to improve care delivery, while GWC parents highlighted both satisfaction with care delivery and social/wellness benefits. GWC parents strongly endorsed this model and reported unique benefits, such as garnering social support and learning from other parents.”
- **Conclusions:** “Parents receiving both models of care identified ways to improve primary care delivery. Given some of the benefits reported by GWC parents, this model may provide the means to enhance resilience in parents and children in low income communities.”

Desai S, Chen F, Boynton-Jarrett R. (2019) **Clinician Satisfaction and Self-Efficacy With CenteringParenting Group Well-Child Care Model: A Pilot Study**. *Journal of Primary Care & Community Health*, Vol 10: 1-6.

- **Summary:** This is a study measuring clinician satisfaction with CenteringParenting that concludes clinicians are generally highly satisfied.
- **Results:** “Providers indicated that the CenteringParenting model achieves each of its four objectives (means ranged from 4.10 to 4.52 for each objective, with 5 being the highest possible response). Providers rated their level of satisfaction (scale of 1 [unsatisfied] to 5 [very satisfied]) with their ability to address patient concerns higher with CenteringParenting in the group care setting (mean = 4.10) than in the individual care setting (mean = 3.55). Respondents demonstrated a high mean average Self-Efficacy in Group Care score of 93.63 (out of 110). Unadjusted logistical regression analyses demonstrated that higher provider Self-Efficacy in Group Care score (odds ratio [OR] = 1.08) and higher comfort with TIC (OR = 22.16) is associated with curriculum content being discussed with a facilitative approach.”
- **Conclusions:** “Providers from diverse clinical sites report high satisfaction with and self-efficacy in implementing the CenteringParenting model.”

Saleh L. (2019). **Women's Perceived Quality of Care and Self-Reported Empowerment With CenteringPregnancy Versus Individual Prenatal Care**. *Nursing for Women's Health* 23(3), 234-244.

- **Summary:** This is a study finding that CenteringPregnancy and traditional prenatal care offer equally effective care. It is important to note that participants in CenteringPregnancy self-selected, which may affect the results.
- **Results:** “The results showed no statistical significance between the individual prenatal care and CenteringPregnancy groups with regard to perceived quality of prenatal care or pregnancy-related self-reported empowerment.”
- **Conclusion:** “CenteringPregnancy has the capability to provide women with quality of care equal to that achieved through traditional prenatal care. Despite the lack of statistically significant findings, this study exposes several areas of interest and provides guidance for future studies evaluating prenatal care.”

Trudnak Fowler T, Aiyelawo Marshall K, Frazier C, Holden C, and Dorris J. (2020) **Health Care Experience Among Women Who Completed Group Prenatal Care (CenteringPregnancy) Compared to Individual Prenatal Care Within Military Treatment Facilities**. *Journal of Patient Experience* 7(6), 1234-1240.

- **Summary:** This is a survey based study comparing participants within TRICARE. It concludes that those taking part in CenteringPregnancy were more likely to be satisfied with their care.

- “This study compared TRICARE, the health care program of the United States Department of Defense Military Health System, beneficiaries in CenteringPregnancy, an enhanced prenatal care model, to women in individual prenatal care within the same military treatment facility. Maternity patient experience ratings from May 2014 to February 2016 were compiled from the TRICARE Outpatient Satisfaction Survey. Centering patients had 1.91 higher odds of being satisfied with access to care ($p < .01$, 95% CI $\frac{1}{4}$ 1.2-3.1) than women in individual care. Specifically, the saw provider within 15 minutes of appointment measure found Centering patients to have 2.00 higher odds of being satisfied than women in individual care ($p < .01$, 95% CI $\frac{1}{4}$ 1.2-3.3). There were no other statistically significant differences between cohorts. Qualitative responses indicate most Centering patients surveyed had good experiences, appreciated the structure and communication with others, and would recommend the program. Providers identified command/leadership support, dedicated space, and buy-in from all staff as important factors for successful implementation. Enhanced prenatal care models may improve access to and experiences with care. Program evaluation will be important as the military health system continues to implement such programs.”

“Providers from diverse clinical sites report high satisfaction with and self-efficacy in implementing the CenteringParenting model.”

Desai, et al.

Psychosocial Outcomes

Felder JN, Epel E, Lewis JB, Cunningham SD, Tobin JN, Rising SS, Ickovics J. (2017). **Depressive Symptoms and Gestational Length among Pregnant Adolescents: Cluster Randomized Control Trial of CenteringPregnancy® Plus Group Prenatal Care.** *Journal of Consulting and Clinical Psychology, 85*(6), 574–584.

- **Summary:** This is a small cluster-randomized study that concluded that CenteringPregnancy is promising in reducing depressive symptoms among pregnant adolescents.
- **Results:** “Adolescents at clinical sites randomized to CenteringPregnancy® Plus experienced greater reductions in perinatal depressive symptoms compared to those at clinical sites randomized to individual care ($p = .003$). Increased depressive symptoms from second to third pregnancy trimester were associated with shorter gestational age at delivery and preterm birth (<37 weeks gestation). Third trimester depressive symptoms were also associated with shorter gestational age and preterm birth. All $p < .05$.”
- **Conclusions:** “Pregnant adolescents should be screened for depressive symptoms prior to the third trimester. Group prenatal care may be an effective non pharmacological option for reducing depressive symptoms among perinatal adolescents.”

Omotola A, Ajayi T, Odugbesan O, De Ornelas M, Joseph N. Omotola. (2019) **The Impact of CenteringParenting on the Psychosocial Emotional Well-Being of Adolescent Mothers, A Quality Improvement Study.** *Journal of Adolescent Health, 64*: S113-S114.

- **Summary:** This is an analysis of interviews with CenteringParenting participants that concluded that adolescent mothers generally had positive experiences with CenteringParenting.
- **Results:** “On average, the CP participants had a mean age of 19.88 years ($SD \pm 1.55$) and (62.5%) graduated high school. The majority of the participants were black (87.50%) and lived with their infants for greater than half of the time (100%). Different themes emerged from the interviews, such as Community support and Parenting Guidance. Most adolescent mothers reported feeling like CP is a safe place where they can speak their mind, receive support, and feel part of a community. One mother stated, “I have a family but can’t talk to them like I can talk to you guys, when I was pregnant, nobody judged me. It is a place you can just be free without being judged.” One said, “I do not really socialize, if the doctor ask me a question I answer.... when I socialize, it is during the meeting”. Most mothers expressed that their parenting skills improved and were overall pleased with CP because they felt cared for, listened to, and encouraged. Adolescent mothers expressed their appreciation to be part of a group that enabled them to monitor their progress and

take care of themselves and their family. CP providers and facilitators were also very accepting of CP and expressed the positive impacts of CP. A CP provider described it as a medical visit where mothers and children were seen by their provider in a stimulating and supportive environment that helps to improve patient's parenting skills, "We teach them how to do their vitals. That's the good thing. We are helping them see how the baby is growing." One CP facilitator stated, "I have had parents say how happy they are with the group and how they want to keep it going even after the age limit." All in all, CP staff felt that they were able to provide adolescent mothers with holistic care by providing a large scope of services such as, medical care, resources, social and community support, and parenting guidance."

- **Conclusions:** "Overall, this evaluation concluded that CP is feasible and acceptable among adolescent mothers at BMC. Data suggests that CP has a positive impact on adolescent mother's physical and psychological well-being. Further, there is a need to explore the effects of CP on repeated PDSA cycles to then conduct an RCT on a larger population."

Platt RE, Acosta J, Stellman J, Sloand E, Caballero TM, Polk S, Wissow LS, Mendelson T, Kennedy CE. (2021). **Addressing Psychosocial Topics in Group Well-Child Care: A Multi-Method Study With Immigrant Latino Families.** *Academic Pediatrics.* 1-10.

- **Summary:** This is a case study of immigrant Latino families participating in CenteringParenting. Providers expressed some concern about having less individual time with each patient while patients reported finding the opportunity to discuss and socialize with other mothers beneficial.
- **Results:** "A total of 42 mothers and 9 providers participated in the study; a purposefully selected subset of 17 mothers was interviewed, all providers were interviewed. Mothers and providers identified both benefits and drawbacks to the structure and care processes in GWCC. The longer total visit time facilitated screening and education around psychosocial topics such as postpartum depression but made participation challenging for some families. Providers expressed concerns about the effects of shorter one-on-one time on rapport-building; most mothers did not express similar concerns. Mothers valued the opportunity to make social connections and to learn from the lived experiences of their peers. Discussions about psychosocial topics were seen as valuable but required careful navigation in the group setting, especially when fathers were present."
- **Conclusions:** "Participants identified unique benefits and barriers to addressing psychosocial topics in GWCC. Future research should explore the effects of GWCC on psychosocial disclosures and examine ways to enhance benefits while addressing the challenges identified."

Immunization and Child Development

Gullett H, Salib M, Rose J, & Stange KC. (2019). **An Evaluation of CenteringParenting: A Group Well-Child Care Model in an Urban Federally Qualified Community Health Center.** *Journal of Alternative and Complementary Medicine*, 25(7), 727-732.

- **Summary:** This is a quantitative study comparing participants in CenteringParenting to participants in individual well-child care at a federally qualified health center. It concludes that those in the CenteringPregnancy group were likely to attend more visits and have higher immunization rates.
- **Results:** “Children participating in CenteringParenting as compared with traditional individual care were demographically similar. Well-child care visits in the first 15 months of life were higher in the CenteringParenting Group (9.19 vs. 5.28, $p < 0.001$), which also exhibited a trend toward higher rates of completing noninfluenza immunizations. There was no difference in lead screening, with high percentages of completion in both groups. Interviews discovered strong maternal, clinician, and staff satisfaction with the program. Mothers noted the unique benefits of learning from and building relationships with each other.”
- **Conclusions:** “This study in a community health center indicates that innovative group care models, such as CenteringParenting, hold promise for delivering value-added elements of social interaction between parents and health care staff, in addition to increasing the number of visits attended by parents and children in the first 15 months of life. Future study is needed to further elucidate maternal, population health, and cost benefits.”

Fenick A, Leventhal J, Gilliam W, & Rosenthal M. (2020) **A Randomized Controlled Trial of Group Well-Child Care: Improved Attendance and Vaccination Timeliness.** *Clinical Pediatrics*, 2020 Jun; 59(7):686-691.

- **Summary:** This is a randomized controlled trial that concludes that infants in group well-child care attended more visits and received more immunizations on time than those in individual well-child care.
- **Abstract:** “Well-child care has suboptimal outcomes regarding adherence to appointments and recall of guidance, especially among families facing structural barriers to health. Group well-child care (GWCC) aims to improve these outcomes by enhancing anticipatory guidance discussions and peer education. We conducted a randomized controlled trial, comparing GWCC with traditional, individual well-child care (IWCC) and assessed health care utilization, immunization timeliness, recall of anticipatory guidance, and family-centered care. Ninety-seven mother-infant dyads were randomized to GWCC or IWCC. Compared with IWCC infants, GWCC infants attended more of the 6 preventive health visits (5.41 vs 4.87, $P < .05$) and received more timely

immunization at 6 months and 1 year but did not differ in emergency or hospital admission rates. There were no differences in mothers' reports of anticipatory guidance received or family-centered care. As primary care is redesigned for value-based care and structural vulnerabilities are considered, GWCC may be a key option to consider."

Irigoyen M, Leib S, Paoletti A, DeLago C. (2020) **Timeliness of Immunizations in CenteringParenting**. *Academic Pediatrics*, 2020 Dec 3:S1876-2859(20)30632-X

- **Summary:** This is a quantitative study comparing children in CenteringParenting and individual well-child care. It concludes that those in CenteringPregnancy had higher rates of visit attendance and immunization.
- **Results:** "The study population included 1735 children (Centering n = 342, individual n = 1393). By 25 months, 62% of children in Centering were up to date with all recommended immunizations compared to 44.2% of children in individual care, a 17.8% higher rate (P < .001). By 25 months, children in Centering made 3 additional well-child visits (9.2 vs 6.2, P < .001). Mediation analysis showed 82% of the effect on up to date status was due to increased attendance to well-child visits (P < .001); the remaining 18% was due to a Centering effect beyond the visit increase."
- **Conclusions:** "Our study showed a strong association of CenteringParenting with timeliness of immunizations and adherence to well-child visits compared to individual visits in a low income community. These findings warrant further exploration of the impact of Centering in reducing health disparities in communities at risk."

Johnston JC, McNeil D, van der Lee G, MacLeod C, Uyanwune Y, and Hill K. (2017) **Piloting CenteringParenting in Two Alberta Public Health Well-Child Clinics**. *Public Health Nursing*, 34(3): 229-237.

- **Summary:** This is a summary of a pilot program implementing CenteringParenting in Alberta, CA.
- **Results:** "Four groups ran in two clinics. Four to eight parent/infant dyads participated in each group, 24 total dyads. Most participating parents were mothers. Dyads in the group model received 12 hr of contact with Public Health over the year compared to 3 hr in the typical one-on-one model. Participants were younger, more likely to have lower levels of education, and lower household income than the comparison group. Parents reported improvements in parenting experiences following the program. At 4 months, all CenteringParenting babies were vaccinated compared to 95% of babies in the comparison group."

- **Conclusions:** “The pilot was successfully completed. Additional research is required to examine the effectiveness of CenteringParenting. Data collected provide insight into potential primary outcomes of interest and informs larger, rigorously designed longitudinal studies.”

Roussos-Ross K, O’Shea T, & Ramos M. (2017). **An Observational Study of the Complementary Pregnancy Outcomes of Patients Enrolled in CenteringPregnancy.** *Journal of Gynecology & Obstetrics* 1(3), e001.

- **Summary:** This study compared women and birthing person in CenteringPregnancy to the general population and concludes that CenteringPregnancy improved outcomes in breastfeeding, immunization, and contraception.
- **Materials and Methods:** “Eighty-five women receiving CP care within an academic institution, who delivered between September 2015 and May 2016 were included for analysis.”
- **Results:** “The breastfeeding initiation rate was 96.5%. The postpartum breastfeeding continuation rate was 62%. Influenza vaccination rate was 67% and Tdap vaccination rate was 68%. Contraceptive initiation rates were 72% overall, with 25% electing LARC. Finally, the preterm delivery rate in the study population was 10.6%.”
- **Conclusion:** “This study demonstrated higher than expected rates of breastfeeding initiation and continuation, immunization rates, and contraceptive rates- specifically LARC. The preterm delivery rate of this study population was similar to traditional care within this community. CenteringPregnancy offers complementary benefits to the health of women and infants outside of the previously reported Centering outcomes.”

Shah N, Fenick A, Rosenthal M. (2016) **A Healthy Weight for Toddlers? Two-Year Follow-up of a Randomized Controlled Trial of Group Well-Child Care.** *Clinical Pediatrics.* (Phila) 55 (14), 1354-1357. 2016 Jul 19.

- **Summary:** This is a report on nutrition related health outcomes of a randomized controlled trial of group well-child care participants that found that there were fewer overweight children among participants.
- **Results:** “In a 2-year follow-up of a RCT of group versus individual well-child care, we found no statistically significant differences in nutrition-related behaviors, BMI percentile, or proportion of overweight or obesity. We did, however, find a trend of less ever-overweight children randomized to group compared with individual care (16% vs 30.7%).”

- Conclusions: “In conclusion, although we did not find statistically significant support for the hypothesis that group well child care in the first year of life altered weight-related health outcomes during early childhood, we found potentially promising trends. Group well-child care may be a viable option for well-child care because the visit structure can be cost-saving or cost neutral and is an example of efficient distribution of health care resources. Moreover, increased time with patients and the opportunity for more in-depth discussion and counseling may increase provider and patient satisfaction, both of which may lead to better health outcomes.”

Visit Attendance/Adequacy of Care

Hamm, R.F., Kumar, N.R., Riegel, M. et al. Addressing Disparities in Care on Labor and Delivery. *Curr Obstet Gynecol Rep* 11, 143–151 (2022).

- **Summary:** The the focus of this review is on how racism and discrimination on labor and delivery contribute to disparities in maternal morbidity and mortality for women of color (Black, Latinx, and Indigenous - American Indian and Alaskan Native) as well as potential levers for improvement. The article explores levers within four pathways of how racism and discrimination contribute to disparities in obstetric outcomes: 1) care segregation, 2) care variation, 3) communication and cultural humility, and 4) structural racism/policy.
- **Results:** Potential levers for change in each pathway, include: 1) care segregation - improve hospital quality through the development of national, state or local health system collaboratives and goals and dashboards for increased transparency; 2) care variation - mandate care standardization, safety bundle implementation, and team training; 3) communication and cultural humility - training in cultural humility targeting clinicians throughout their career, mechanisms for reporting racism and microaggressions, and incorporating community partnerships and patient engagement and 4) anti-bias training, organizational changes such as calculators and shared decision making, and increasing BIPOC clinicians
- **Conclusions:** While proposed changes in each of these pathways is an individual stream, no one lever will produce substantive change and there are opportunities for crossover in each. Future research and actions must embrace participatory approaches with impacted populations and continually applying an equity lens to each area of study. Some of the levers discussed have substantive research to support better outcomes, but many have not been adequately researched. Rigorous research on innovative interventions specifically during labor are needed to reduce obstetric racial and ethnic disparities.

Kennedy HP, Farrell T, Paden R, Hill S, Jolivet R, Cooper B, Rising SS. (2011). **A Randomized Clinical Trial of Group Prenatal Care in Two Military Settings.** *Military Medicine*, 176; 10/2011: 1169-1177.

- **Summary:** This is a randomized clinical trial that found positive impacts of CenteringPregnancy in both objectively measurable health indicators and patient-reported measures of satisfaction.
- **Results:** “A 3-year randomized clinical trial was conducted to test for differences in perinatal health behaviors, perinatal and infant health outcomes, and family health outcomes for women receiving group prenatal care (GPC) when compared to those receiving individual prenatal care. Women in GPC were almost 6 times more likely to receive adequate prenatal care than women in individual prenatal care and significantly more satisfied with their care. No differences were found by group for missed days of work, perceived stress, or social support. No differences in prenatal

or postnatal depression symptoms were found in either group; however, women in GPC were significantly less likely to report feelings of guilt or shame.”

- **Conclusions:** “The CenteringPregnancy program offers a model for prenatal care that can be implemented in military treatment facilities with increased satisfaction and adequacy of care and without any increase in adverse outcomes.”

“Innovative group care models, such as CenteringParenting, hold promise for delivering value-added elements of social interaction between parents and health care staff, in addition to increasing the number of visits attended by parents and children in the first 15 months of life.”

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Fenick A, Leventhal J, Gilliam W, & Rosenthal M. (2020) **A Randomized Controlled Trial of Group Well-Child Care: Improved Attendance and Vaccination Timeliness.** *Clinical Pediatrics*, 2020 Jun; 59(7):686-691.

- **Summary:** This is a randomized controlled trial that concludes that infants in group well-child care attended more visits and received more immunizations on time than those in individual well-child care.
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Gullett H, Salib M, Rose J, & Stange KC. (2019). **An Evaluation of CenteringParenting: A Group Well-Child Care Model in an Urban Federally Qualified Community Health Center.** *Journal of Alternative and Complementary Medicine*, 25(7), 727-732.

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Marton, J., Smith, J. C., Heberlein, E. C., Laboy, A., Britt, J., & Crockett, A. H. (2021). **Group Prenatal Care and Emergency Room Utilization. Medical care research and review** : MCCR, 10775587211059938. Advance online publication. <https://doi.org/10.1177/10775587211059938>

- **Summary:** This is a retrospective cohort study that compares Emergency Room (ER) utilization between pregnant people participating in group prenatal care and individual prenatal care utilizing Medicaid claims and birth certificate data in South Carolina. The study found that group care, specifically CenteringPregnancy, was associated with a significant reduction in the likelihood of having any ER utilization.
- **Results:** Using propensity score matching methods, the study found that group care was associated with a -5.9% reduction among women and birthing person receiving any group care and -6.0% in the likelihood of having any ER utilization among pregnant people attending at least five group care sessions.
- **Conclusion:** These findings suggest that group care may reduce ER utilization among pregnant women and encourage appropriate health care utilization during pregnancy. Because of additional time for patient education and provider relationships, group prenatal care may reduce ER visits among pregnant women by helping them identify appropriate care settings, improving understanding of common pregnancy discomforts, and reducing risky health behaviors.

Mazzoni SE, Hill PK, Webster KW, Heinrichs GA, (2015). **Hoffman MC. Group prenatal care for women with gestational diabetes.** *The Journal of Maternal Fetal & Neonatal Medicine*: 1-5.

- **Summary:** This is a study group subjects were more likely to attend a postpartum visit (92% versus 66%; $p < 0.002$) and were almost 4 times more likely to receive recommended diabetes screening postpartum (odds ratio 3.9, CI 1.8–8.6)
- **Results:** "A total of 165 subjects were included: 62 in group care and 103 in conventional care. Compared with patients with conventional care, group subjects were more likely to attend a postpartum visit (92% versus 66%; $p = 0.002$) and were almost 4 times more likely to receive recommended diabetes screening postpartum (OR 3.9, CI 1.8-8.6). Group subjects were much less likely to progress to A2 GDM (OR 0.15, CI 0.07-0.30). There were no differences in neonatal outcomes."
- **Conclusion:** "Group prenatal care for women and birthing person with diabetes is associated with decreased progression to A2 GDM and improved postpartum follow-up for appropriate diabetes screening without significantly affecting obstetrical or neonatal outcomes."

Meriwether, Kate Vellenga MD; Panter, Virginia CNM; McWethy, Magdalena MS; Rishel Brakey, Heidi MA; Komesu, Yuko M. MD. (2022) **Centering Group Treatment for Women With Interstitial Cystitis/Bladder Pain Syndrome: A Qualitative Analysis, Female Pelvic Medicine & Reconstructive Surgery**

- **Summary:** "Women with interstitial cystitis/bladder pain syndrome (ICBPS) face challenging treatment and feelings of isolation. Centering models of group medical visits have been successful in other spheres but have not been explored in ICBPS therapy. We sought to describe opinions of women with ICBPS regarding Centering visits, including advantages, experience, and barriers to participation and efficacy. Patients who attended Centering visits participated in a focus group and/or filled out written commentary in evaluations, and control patients were individually interviewed. We coded transcripts using NVivo software for emergent themes."
- **Results:** "We conducted 4 control patient individual interviews, had one focus group of Centering patients, and collected comments from 34 post-Centering surveys. Emergent themes of interest included motivations and barriers to joining, cost, leadership, connecting with others, diversity, learning, alternative treatments, and areas for improvement. Regardless of participation in Centering, patients noted the importance of self-care and sharing with other women with ICBPS, and they emphasized feelings of isolation in their disease and discouraging health care experiences. Women in Centering noted that the biggest advantages of Centering were learning from other women with ICBPS, the creation of a welcoming and safe space, and the feeling that Centering was more of a support group than a medical visit. Women noted that barriers to Centering included cost and logistical issues, such as time and format."
- **Conclusion:** "Women with ICBPS treatment note that Centering group visits provide a sense of learning and community that opens them to a wider variety of options".

Trotman, Gylynthia, et al. (2015) "The effect of CenteringPregnancy versus traditional prenatal care models on improved adolescent health behaviors in the perinatal period." *Journal of Pediatric and Adolescent Gynecology* 28.5 : 395-401.

- **Summary:** Adolescents in the CenteringPregnancy group were more likely to comply with prenatal and postpartum visits and to meet the 2009 Institute of Medicine gestational weight guidelines for weight gain in pregnancy than were adolescents in either multiprovider (62.0% vs 38.0%, P = .02) or single – provider (62.0% vs 38.0%, P = .02) groups
- **Results:** “Fifty individuals were evaluated in each group. Adolescents in the CenteringPregnancy group were more likely to comply with prenatal and postpartum visits and to meet the 2009 Institute of Medicine gestational weight guidelines for weight gain in pregnancy than were adolescents in either multiprovider (62.0% vs 38.0%, P = .02) or single-provider (62.0% vs 38.0%, P = .02) groups. The CenteringPregnancy group was also more likely to solely breastfeed compared with adolescents in the multiprovider group (40.0% vs 20.0%, P = .03) and include breastfeeding in addition to bottle-feeding compared with both multiprovider (32.0% vs 14.0%, P = .03) and single-provider (32.0% vs 12.0%, P = .03) patient groups. Additionally, the CenteringPregnancy group had increased uptake of long-acting reversible contraception and were less likely to suffer from postpartum depression.”
- **Conclusions:** “CenteringPregnancy Prenatal Care program aids in compliance to prenatal visits, appropriate weight gain, increased uptake of highly effective contraception, and breastfeeding among adolescent mothers.”

Trudnak TC, Arboleda E, Kirby RS, Perrin K. (2013) **Outcomes of Latina women in CHI 2016 CenteringPregnancy group prenatal care compared with individual prenatal care.** *Journal of Midwifery and Women’s Health.* July-Aug 58(4) 396-403.

- **Summary:** This is a retrospective study of Latina Spanish-speaking women and birthing person participating in CenteringPregnancy. It found that CenteringPregnancy participants had increased odds of vaginal birth and care utilization although not of breastfeeding.
- **Results:** “A total of 487 patient charts were obtained for data collection CenteringPregnancy n = 247, individual n = 240). No differences in low-birth-weight or preterm births were observed between the groups. Compared with women in individual care, women in CenteringPregnancy had higher odds of giving birth vaginally (adjusted odds ratio [aOR], 2.57; 95% confidence interval [CI], 1.23-5.36), attending prenatal care visits (aOR, 11.03; 95% CI, 4.53-26.83), attending postpartum care visits (aOR, 2.20; 95% CI, 1.20-4.05), and feeding their infants formula only (aOR, 6.07; 95% CI, 2.57-14.3). Women in CenteringPregnancy also had lower odds of gaining below the recommended amount of gestational weight (aOR, 0.41; 95% CI, 0.22-0.78).”

- Discussion: “Women and birthing person in CenteringPregnancy had higher health care utilization, but there were no differences in preterm birth or low birth weight. Randomized studies are needed to eliminate selection bias.”

CenteringParenting Implementation

Castellan CM, Casola AR, Weinstein LC. (2021). **Centering Providers to Deliver Group Care: Implementing CenteringPregnancy and CenteringParenting at an Urban Federally Qualified Health Center.** *Population Health Management* 24(2).

- **Summary:** This is an article describing the process of implementing CenteringPregnancy from the perspective of three physicians.
- **Results:** “Throughout this time we never abandoned the goal of starting CenteringPregnancy. Finally, in May 2019, we were able to start the first CenteringPregnancy cohort. Most of these moms have now delivered and have graduated into a CenteringParenting group. We are excited about continuing these cohorts but know that there is still a learning curve to overcome. Some sessions have full participation, while others have high no-show rates. On days when it feels like the efforts with group care are for naught, we think about the support they provide patients. We remind ourselves about the comradery and fellowship they foster. During one CenteringParenting group session, a mother discussed having to give her young infant cereal mixed with formula because she was running out before her next monthly Women, Infants, and Children supply. Another mother jumped in and asked what type of formula she was using. It turns out this mom had some left over, and quickly walked home after a group session to get a large container of formula for the other mom.”
- **Conclusions:** “Moments like this one remind us why we need to keep the group model going. Patients need this kind of peer support, and that is something the health care system cannot offer on its own. Moreover, the path to group care is a reminder to our care team, and to you, that sometimes any action is better than planned perfection. Implementing a new program can feel daunting, but we have to center ourselves as providers and recognize that, at times, living outside of our comfort zone may be the way we best support our patients.”

Connor KA, Duran G, Faiz-Nassar M, Mmari K, & Minkovitz CS. (2018). **Feasibility of Implementing Group Well Baby/Well Woman Dyad Care at Federally Qualified Health Centers.** *Academic pediatrics, 18(5), 510–515*

- **Summary:** This is a study based on interviews of mothers, clinicians, staff, and administrators. Most interviewees had a positive impression of CenteringParenting.
- **Results:** “Interviews were completed with 26 mothers and 16 clinicians, staff, and administrators. Most participants considered CP desirable. Facilitators included: peer support and education, emphasis on maternal wellness, and increased patient and clinician satisfaction. Barriers included: exposure to “others,” scheduling and coordination of care, productivity, training requirements, and cost. Parenting experience did not appear to affect perspectives on CP.”
- **Conclusions:** “Perceptions regarding facilitators and barriers to CP implementation in FQHCs are similar to existing group well-child care literature. The benefit of emphasis on maternal wellness is

a unique finding. Maternal wellness integration might make CP a particularly desirable model for implementation at FQHCs, but potential systems barriers must be addressed.”

Gullett H, Salib M, Rose J, & Stange KC. (2019). **An Evaluation of CenteringParenting: A Group Well-Child Care Model in an Urban Federally Qualified Community Health Center.** *Journal of Alternative and Complementary Medicine*, 25(7), 727-732.

- **Summary:** This is a quantitative study comparing participants in CenteringParenting to participants in individual well-child care at a federally qualified health center. It concludes that those in the CenteringPregnancy group were likely to attend more visits and have higher immunization rates.
- **Results:** “Children participating in CenteringParenting as compared with traditional individual care were demographically similar. Well-child care visits in the first 15 months of life were higher in the CenteringParenting Group (9.19 vs. 5.28, $p < 0.001$), which also exhibited a trend toward higher rates of completing noninfluenza immunizations. There was no difference in lead screening, with high percentages of completion in both groups. Interviews discovered strong maternal, clinician, and staff satisfaction with the program. Mothers noted the unique benefits of learning from and building relationships with each other.”
- **Conclusions:** “This study in a community health center indicates that innovative group care models, such as CenteringParenting, hold promise for delivering value-added elements of social interaction between parents and health care staff, in addition to increasing the number of visits attended by parents and children in the first 15 months of life. Future study is needed to further elucidate maternal, population health, and cost benefits.”

Jones KA, Do S, Porras-Javier L, Contreras S, Chung PJ, Coker TR. (2018) **Feasibility and Acceptability in a Community-Partnered Implementation of CenteringParenting for Group Well-Child Care.** *Academic Pediatrics*, 18(6), 264-269.

- **Summary:** This is an analysis of CenteringParenting participants six months later that reported most participants feeling satisfied.
- **Results:** “Of the 40 parent-infant dyads enrolled in the pilot, 28 CenteringParenting participants completed the 6-month follow-up assessment. The majority of infants were Latino, black, or “other” race/ethnicity; over 90% were Medicaid insured. Of the 28 CenteringParenting participants who completed the 6-month follow-up, 25 completed all visits between ages 2 weeks and 6 months in the CenteringParenting group. Of the CenteringParenting participants, 97% to 100% reported having adequate time with their provider and sufficient patient education and having their needs met at visits; most reported feeling comfortable at the group visit, and all reported wanting to continue CenteringParenting for their WCC. CenteringParenting participants’ mean scores on

exploratory measures demonstrated positive experiences of care, overall satisfaction of care, confidence in parenting, and parental social support.”

- **Conclusions:** “A community-academic partnership implemented CenteringParenting; the intervention was acceptable and feasible for a minority, low-income population. We highlight key challenges of implementation.”

Mittal, P. (2011). **Centering Parenting: Pilot Implementation of a Group Model for Teaching Family Medicine Residents Well-Child Care.** *The Permanente Journal*, 15(4), 40-41.

- **Summary:** This is a study describing the benefits to family medicine residents of participating in CenteringParenting.
- **Discussion:** “In contrast to standard care, the Centering Parenting model allows residents to experience comparative development as well as interactions among a group of parents and children. We believe that the biggest advantage that this group exercise offers residents is the ability to see many babies at the same time longitudinally. They can see development in motion: the one-month-old baby compared with the three-month-old baby in the group; signs that the parents notice to determine readiness for solids; discussions about home safety for a child who has started crawling. These discussions and the availability of all of the babies at the same time, on an ongoing basis, provide education in child development that is clearer and longer-lasting than afforded by traditional well-child care. Also, because most residents do not have their own children, the group setting performs the important function of helping them to learn about child development in a much more organic way than the traditional care setting allows. Additionally, the expanded schedule of the group model allows for more time to learn and discuss development, both with parents and with residents.”

Well-Child Care Implementation

Coker TR, Moreno C, Shekelle PG, Schuster MA, Chung PJ. (2014) **Well-Child Care Clinical Practice Redesign for Serving Low-Income Children.** *Pediatrics*; 134(1): e229-e239.

- **Summary:** This is a description of the creation of new models of well-child care for low-income children, including group well-child care.
- **Results:** “In collaboration with a CHC and 2 pediatric practices, we used a modified Delphi/EP process to design a new model for WCC delivery at each clinical site. The 2 newly developed models rely heavily on a trained health educator for anticipatory guidance and efficient, but comprehensive, developmental, behavioral, and psychosocial surveillance. The well-visit is considerably longer in these models of care, and parents of healthy children spend only a minority of their time with the physician at each visit. A Web-based tool to customize the visit to parents’ needs and facilitate previsit screening is viewed as an essential element of all the models. Scheduled non–face-to face methods for parent communication with the health care team are also viewed as critical to success.”
- **Conclusions:** “In creating these models, we combined a community-based approach with a modified Delphi method. Our adaptation of the RAM is novel in 2 ways: we used the RAM (1) in conjunction with clinic-specific working groups and (2) to design a new and innovative delivery model for care. This structured process engaged small, independent practices.”

Coker TR, Chung PJ, Cowgill BO, Chen L, and Rodriguez MA. (2009) **Low-Income Parents' Views on the Redesign of Well-Child Care.** *Pediatrics*; 124(1): 194-204.

- **Summary:** This is a qualitative study based on interviews of low-income parents.
- **Results:** “Parents were mostly mothers (91%), nonwhite (64% Latino, 16% black), and 30 years of age (66%) and had an annual household income of \$35 000 (96%). Parents reported substantial problems with WCC, focusing largely on limited provider access (especially with respect to scheduling and transportation) and inadequate behavioral/ developmental services. Most parents endorsed nonphysician providers and alternative locations and formats as desirable adjuncts to usual physician-provided, clinic-based WCC. Nonphysician providers were viewed as potentially more expert in behavioral/developmental issues than physicians and more attentive to parent-provider relationships. Some alternative locations for care (especially home and day care visits) were viewed as creating essential context for providers and dramatically improving family convenience. Alternative locations whose sole advantage was convenience (eg, retail-based clinics), however, were viewed more skeptically. Among alternative formats, group visits in particular were seen as empowering, turning parents into informal providers through mutual sharing of behavioral/developmental advice and experiences.”

Yoshida H, Fenick AM, Rosenthal MS. (2014) **Group Well-Child Care: An Analysis of Cost**. *Clinical Pediatrics*, 53(4): 387-394.

- **Summary:** This is an analysis showing group well-child care can be delivered at the same cost as individual well-child care.
- **Results:** “We achieved cost-neutrality at 4 families in the APRN group WCV model; at 3, 4, 5, and 6 families in the resident model with 30, 45, 60, and 90 minutes of attending supervision, respectively; and at 4 and 5 families in the low and high attending salary model, respectively.”
- **Conclusion:** “Group WCV can be delivered in a cost-neutral manner by optimizing group size and provider participation.”

Clinician Satisfaction

Gullett H, Salib M, Rose J, & Stange KC. (2019). **An Evaluation of CenteringParenting: A Group Well-Child Care Model in an Urban Federally Qualified Community Health Center.** *Journal of Alternative and Complementary Medicine*, 25(7), 727-732.

- **Summary:** This is a quantitative study comparing participants in CenteringParenting to participants in individual well-child care at a federally qualified health center. It concludes that those in the CenteringPregnancy group were likely to attend more visits and have higher immunization rates.
- **Results:** “Children participating in CenteringParenting as compared with traditional individual care were demographically similar. Well-child care visits in the first 15 months of life were higher in the CenteringParenting Group (9.19 vs. 5.28, $p < 0.001$), which also exhibited a trend toward higher rates of completing noninfluenza immunizations. There was no difference in lead screening, with high percentages of completion in both groups. Interviews discovered strong maternal, clinician, and staff satisfaction with the program. Mothers noted the unique benefits of learning from and building relationships with each other.”
- **Conclusions:** “This study in a community health center indicates that innovative group care models, such as CenteringParenting, hold promise for delivering value-added elements of social interaction between parents and health care staff, in addition to increasing the number of visits attended by parents and children in the first 15 months of life. Future study is needed to further elucidate maternal, population health, and cost benefits.”

McNeil DA, Johnston JC, der Lee GV, Wallace N. (2016) **Implementing CenteringParenting in Well Child Clinics: Mothers’ Nurses’ and Decision Makers’ Perspectives .** *Journal of Community Public Health Nursing*, 2(3).

- **Summary:** This is a report on interviews of participants in CenteringParenting that found mothers had a positive response.
- **Results:** “Thirteen mothers, five nurses and four decision makers were interviewed. Mothers found the program valuable in meeting their need for peer and personal support, information, and skill development. Nurses, although enjoying the opportunity to participate in the CP model, experienced challenges with the group model. Decisionmakers identified the need for new ways of thinking.”
- **Conclusion:** “The CP program provided benefits to new mothers beyond what they expected. PHN facilitators experienced conflicts with standard practice, but were committed to making it work. Addressing logistical challenges will be required prior to expansion.”

MacMillan Uribe AL, Woelky KR, & Olson BH. (2019). **Exploring Family-Medicine Providers' Perspectives on Group Care Visits for Maternal and Infant Nutrition Education.** *Journal of Nutrition Education and Behavior*, 51(4), 409-418.

- **Summary:** This is a study describing the interest in and concerns about group care by primary care providers regarding nutrition.
- **Results:** “Family medicine primary care providers are limited in the ability to provide maternal and infant nutrition education and desire a different approach. Group care was the preferred method; it was shared most frequently as the ideal approach to nutrition education delivery and participants reacted favorably when presented with this model. However, there were many concerns with group care (eg, moderating difficult conversations, program implementation logistics, sufficient group volume, and interruption in patient –provider relationship).”
- **Conclusion and Implications:** “Family medicine primary care providers desire a different approach to deliver nutrition education to mother–infant dyads in clinic. A group care model may be well-accepted among family medicine primary care providers but issues must be resolved before implementation. These results could inform future group care implementation studies and influence provider buy-in.”

Mittal, P. (2011). **CenteringParenting: Pilot Implementation of a Group Model for Teaching Family Medicine Residents Well-Child Care.** *The Permanente Journal*, 15(4), 40-41.

- **Summary:** This is a study describing the benefits to family medicine residents of participating in CenteringParenting.
- **Discussion:** “In contrast to standard care, the CenteringParenting model allows residents to experience comparative development as well as interactions among a group of parents and children. We believe that the biggest advantage that this group exercise offers residents is the ability to see many babies at the same time longitudinally. They can see development in motion: the one-month-old baby compared with the three-month-old baby in the group; signs that the parents notice to determine readiness for solids; discussions about home safety for a child who has started crawling. These discussions and the availability of all of the babies at the same time, on an ongoing basis, provide education in child development that is clearer and longer-lasting than afforded by traditional well-child care. Also, because most residents do not have their own children, the group setting performs the important function of helping them to learn about child development in a much more organic way than the traditional care setting allows. Additionally, the expanded schedule of the group model allows for more time to learn and discuss development, both with parents and with residents.”

Rosenthal MS, Connor KA, Fenick AM. (2014) **Pediatric residents' perspectives on relationships with other professionals during well child care.** J Interprof Care, 28(5): 481-484.

- **Summary:** This is an analysis of pediatric residents' experiences during well-child care that concludes that, although there were some positive and negative experiences reported in individual well-child care settings, only positive experiences were reported in group well-child care settings.
- **Results:** "This study aimed to examine pediatric residents' perspectives of primary care professional relationships. Using a longitudinal qualitative study design, we conducted 15 semi-structured interviews with five second-year pediatric residents who elected to participate in a one-year intervention, facilitating group well child care (GWCC). Pediatric residents described a spectrum of professional relationship types including: ignorant, transactional, workaround, educational and equitable. Residents described ignorant, transactional and workaround relationships with feelings of frustration, and they described educational and equitable relationships with feelings of satisfaction and humility."
- **Conclusions:** "While residents described optimal relationships in both traditional WCC and GWCC, they described suboptimal relationships in only traditional WCC. Further study is needed to assess if our model of GWCC may create a scaffolding upon which optimal relationships in interprofessional teams are likely to flourish."

Health Equity

Abshire C, Mcdowell M, Crockett AH, Fleischer NL. (2019). **The Impact of CenteringPregnancy Group Prenatal Care on Birth Outcomes in Medicaid Eligible Women.** *Journal of Women's Health* 28(7), 919-928.

- **Summary:** This is a quantitative study that compares outcomes in group prenatal care and traditional prenatal care. It concludes that women and birthing person in group prenatal care had lower risks of PTB, sPTB, LBW and NICU admissions.
- **Results:** “The analysis included 1,292 women in GPNC and 8,703 in traditional individual prenatal care (IPNC). After controlling for potential confounders, the risk of PTB (risk ratio [RR] 0.38; 95% confidence interval [CI] 0.31–0.47), sPTB (RR 0.49; 95% CI 0.38–0.63), LBW (RR 0.46; 95% CI 0.37–0.56), and NICU admissions (RR 0.46; 95% CI 0.37–0.57) was lower in GPNC compared to IPNC women. Results differed by maternal race/ethnicity, with the strongest associations among non-Hispanic white mothers and the weakest associations among Hispanic mothers, especially for sPTB. Similarly, the risk of PTB, LBW, and NICU admissions was lower among GPNC women who attended more than five sessions.”
- **Conclusion:** “Participation in GPNC demonstrated a decreased risk for sTB, as well as other adverse birth outcomes. In addition, participation in more than five PNC sessions demonstrated a decreased risk for adverse birth outcomes. Prospective longitudinal studies are needed to further explore mechanisms associated with these findings.”

Coker TR, Chung PJ, Cowgill BO, Chen L, and Rodriguez MA. (2009) **Low-Income Parents' Views on the Redesign of Well-Child Care.** *Pediatrics*; 124(1): 194-204.

- **Summary:** This is a qualitative study based on interviews of low-income parents.
- **Results:** “Parents were mostly mothers (91%), nonwhite (64% Latino, 16% black), and 30 years of age (66%) and had an annual household income of \$35 000 (96%). Parents reported substantial problems with WCC, focusing largely on limited provider access (especially with respect to scheduling and transportation) and inadequate behavioral/ developmental services. Most parents endorsed nonphysician providers and alternative locations and formats as desirable adjuncts to usual physician-provided, clinic-based WCC. Nonphysician providers were viewed as potentially more expert in behavioral/developmental issues than physicians and more attentive to parent-provider relationships. Some alternative locations for care (especially home and day care visits) were viewed as creating essential context for providers and dramatically improving family convenience. Alternative locations whose sole advantage was convenience (eg, retail-based clinics), however, were viewed more skeptically. Among alternative formats, group visits in

particular were seen as empowering, turning parents into informal providers through mutual sharing of behavioral/developmental advice and experiences.”

- **Conclusions:** “Low-income parents of young children identified major inadequacies in their WCC experiences. To address these problems, they endorsed a number of innovative reforms that merit additional investigation for feasibility and effectiveness.”

DeLago C, Dickens B, Phipps E, Paoletti A, Kazmierczak M, Irigoyen M. (2018) **Qualitative Evaluation of Individual and Group Well-Child Care.** *Academic Pediatrics* 18(5): 516-524.

- **Summary:** This is a mixed method study analyzing patient impressions of CenteringParenting. Patients reported social and wellness benefits to participating in CenteringParenting.
- **Results:** “Both groups had similar demographics: parents were mostly female (91%) and black (>80%); about half had incomes < \$20,000. Parents’ mean age was 27 years; children’s mean age was 11 months. There were no significant differences in overall scores measuring trust in physicians, parent empowerment, or stress. IWC parents’ themes highlighted ways to improve care delivery, while GWC parents highlighted both satisfaction with care delivery and social/wellness benefits. GWC parents strongly endorsed this model and reported unique benefits, such as garnering social support and learning from other parents.”
- **Conclusions:** “Parents receiving both models of care identified ways to improve primary care delivery. Given some of the benefits reported by GWC parents, this model may provide the means to enhance resilience in parents and children in low income communities.”

Ickovics JR, Kershaw T, Westdahl C, Magriples U, Massey Z, Reynolds H, Rising, S. (2007). **Group Prenatal Care and Perinatal Outcomes: A randomized controlled trial.** *Obstetrics and Gynecology*,110(2), Part 1: 330-39.

- **Summary:** This is a quantitative study of women and birthing person participating in CenteringPregnancy that found that CenteringPregnancy participants were at lower risk of preterm births and reported feeling more prepared than those in traditional prenatal care.
- **Results:** “Mean age of participants was 20.4 years; 80% were African American. Using intent-to-treat analyses, women assigned to group care were significantly less likely to have preterm births compared with those in standard care: 9.8% compared with 13.8%, with no differences in age, parity, education, or income between study conditions. This is equivalent to a risk reduction of 33% (odds ratio 0.67, 95% confidence interval 0.44-0.99, P=.045), or 40 per 1,000 births. Effects were strengthened for African-American women: 10.0% compared with 15.8% (odds ratio 0.59, 95% confidence interval 0.38-0.92, P=.02). Women in group sessions

were less likely to have suboptimal prenatal care ($P < .01$), had significantly better prenatal knowledge ($P < .001$), felt more ready for labor and delivery ($P < .001$), and had greater satisfaction with care ($P < .001$). Breastfeeding initiation was higher in group care: 66.5% compared with 54.6%, $P < .001$. There were no differences in birth weight nor in costs associated with prenatal care or delivery.”

- **Conclusions:** “Group prenatal care resulted in equal or improved perinatal outcomes at no added cost.”

Jones KA, Do S, Porras-Javier L, Contreras S, Chung PJ, Coker TR. (2018) **Feasibility and Acceptability in a Community-Partnered Implementation of CenteringParenting for Group Well-Child Care.** *Academic Pediatrics*, 18(6), 264-269.

- **Summary:** This is an analysis of CenteringParenting participants six months later that reported most participants feeling satisfied.
- **Results:** “Of the 40 parent-infant dyads enrolled in the pilot, 28 CenteringParenting participants completed the 6-month follow-up assessment. The majority of infants were Latino, black, or “other” race/ethnicity; over 90% were Medicaid insured. Of the 28 CenteringParenting participants who completed the 6-month follow-up, 25 completed all visits between ages 2 weeks and 6 months in the CenteringParenting group. Of the CenteringParenting participants, 97% to 100% reported having adequate time with their provider and sufficient patient education and having their needs met at visits; most reported feeling comfortable at the group visit, and all reported wanting to continue CenteringParenting for their WCC. CenteringParenting participants’ mean scores on exploratory measures demonstrated positive experiences of care, overall satisfaction of care, confidence in parenting, and parental social support.”
- **Conclusions:** “A community-academic partnership implemented CenteringParenting; the intervention was acceptable and feasible for a minority, low-income population. We highlight key challenges of implementation.”

“The CenteringPregnancy group prenatal care program may be especially valuable for African American mothers and may help reduce racial/ethnic disparities with respect to important pregnancy outcomes.”

Smith, et al.

Omotola A, Ajayi T, Odugbesan O, De Ornelas M, Joseph N. Omotola. (2019) **The Impact of CenteringParenting on the Psychosocial Emotional Well-Being of Adolescent Mothers, A Quality Improvement Study**. *Journal of Adolescent Health*, 64: S113-S114.

- **Summary:** This is an analysis of interviews with CenteringParenting participants that concluded that adolescent mothers generally had positive experiences with CenteringParenting.
- **Results:** “On average, the CP participants had a mean age of 19.88 years (SD¼1.55) and (62.5%) graduated high school. The majority of the participants were black (87.50%) and lived with their infants for greater than half of the time (100%). Different themes emerged from the interviews, such as Community support and Parenting Guidance. Most adolescent mothers reported feeling like CP is a safe place where they can speak their mind, receive support, and feel part of a community. One mother stated, “I have a family but can’t talk to them like I can talk to you guys, when I was pregnant, nobody judged me. It is a place you can just be free without being judged.” One said, “I do not really socialize, if the doctor ask me a question I answer.... when I socialize, it is during the meeting”. Most mothers expressed that their parenting skills improved and were overall pleased with CP because they felt cared for, listened to, and encouraged. Adolescent mothers expressed their appreciation to be part of a group that enabled them to monitor their progress and take care of themselves and their family. CP providers and facilitators were also very accepting of CP and expressed the positive impacts of CP. A CP provider described it as a medical visit where mothers and children were seen by their provider in a stimulating and supportive environment that helps to improve patient’s parenting skills, “We teach them how to do their vitals. That’s the good thing. We are helping them see how the baby is growing.” One CP facilitator stated, “I have had parents say how happy they are with the group and how they want to keep it going even after the age limit.” All in all, CP staff felt that they were able to provide adolescent mothers with holistic care by providing a large scope of services such as, medical care, resources, social and community support, and parenting guidance.”
- **Conclusions:** “Overall, this evaluation concluded that CP is feasible and acceptable among adolescent mothers at BMC. Data suggests that CP has a positive impact on adolescent mother’s physical and psychological well-being. Further, there is a need to explore the effects of CP on repeated PDSA cycles to then conduct an RCT on a larger population.”

Platt RE, Acosta J, Stellman J, Sloand E, Caballero TM, Polk S, Wissow LS, Mendelson T, Kennedy CE. (2021). **Addressing Psychosocial Topics in Group Well-Child Care: A Multi-Method Study With Immigrant Latino Families**. *Academic Pediatrics*. 1-10.

- **Summary:** This is a case study of immigrant Latino families participating in CenteringPregnancy. Providers expressed some concern about having less individual time with each patient while patients reported finding the opportunity to discuss and socialize with other mothers beneficial.
- **Results:** “A total of 42 mothers and 9 providers participated in the study; a purposefully selected subset of 17 mothers was interviewed, all providers were interviewed. Mothers and providers identified both benefits and drawbacks to the structure and care processes in GWCC. The longer total visit time facilitated screening and education around psychosocial topics such as postpartum depression but made participation challenging for some families. Providers expressed concerns about the effects of shorter one-on-one time on rapport-building; most mothers did not express similar concerns. Mothers valued the opportunity to make social connections and to learn from the lived experiences of their peers. Discussions about psychosocial topics were seen as valuable but required careful navigation in the group setting, especially when fathers were present.”
- **Conclusions:** “Participants identified unique benefits and barriers to addressing psychosocial topics in GWCC. Future research should explore the effects of GWCC on psychosocial disclosures and examine ways to enhance benefits while addressing the challenges identified.”

Smith, Adrienne M., Mehak; and Lian, Brad (2020) "**Effects of CenteringPregnancy on Pregnancy Outcomes and Health Disparities in Racial Groups versus Traditional Prenatal Care,**" Journal of the Georgia Public Health Association: Vol. 8 : No. 1 , Article 8. DOI: 10.20429/jgpha.2020.080108

- **Summary:** This is a study analyzing women and birthing person who took part in CenteringPregnancy that concludes African American mothers saw particular benefits from CenteringPregnancy.
- **Methods:** “A retrospective cohort study was conducted to examine differences with respect to several pregnancy outcomes such as low birth weight.”
- **Results:** “There were no statistically significant differences between the groups on pregnancy outcomes. When the groups were stratified by race/ethnicity, however, African American mothers saw some benefit from CenteringPregnancy with their babies being born, on average, one week later ($p=0.04$) and having fewer NICU admittances ($p=0.04$) than their African American counterparts receiving traditional care”.
- **Conclusion:** “The CenteringPregnancy group prenatal care program may be especially valuable for African American mothers and may help reduce racial/ethnic disparities with respect to important pregnancy outcomes. Our results have implications that full adoption

of CenteringPregnancy in clinical practice at the Anderson Clinic will better service communities of mothers who are underserved, at-risk and vulnerable.”

Picklesimer A., Billings D., Hale J., Blackhurst, D., and Covington-Kolb, S. (2012). **The effect of CenteringPregnancy group prenatal care on preterm birth in a low-income population.** *American Journal of Obstetrics & Gynecology* Vol 206: 415. e1-7.

- **Summary:** This is a quantitative study that found that participation in CenteringPregnancy reduced the likelihood of preterm birth.
- **Results:** “Risk factors for preterm birth were similar for group prenatal care vs traditional prenatal care: smoking (16.9% vs 20%; P = .17), sexually transmitted diseases (15.8% vs 13.7%; P = .29), and previous preterm birth (3.2% vs 5.4%; P = .08). Preterm delivery (<37 weeks' gestation) was lower in group care than traditional care (7.9% vs 12.7%; P = .01), as was delivery at <32 weeks' gestation (1.3% vs 3.1%; P = .03). Adjusted odds ratio for preterm birth for participants in group care was 0.53 (95% confidence interval, 0.34–0.81). The racial disparity in preterm birth for black women, relative to white and Hispanic women, was diminished for the women in group care.”
- **Conclusions:** “Among low-risk women, participation in group care improves the rate of preterm birth compared with traditional care, especially among black women. Randomized studies are needed to eliminate selection bias.”

Trudnak TC, Arboleda E, Kirby RS, Perrin K. (2013) **Outcomes of Latina women in CHI 2016 CenteringPregnancy group prenatal care compared with individual prenatal care.** *Journal of Midwifery and Women's Health.* July-Aug 58(4) 396-403.

- **Summary:** This is a retrospective study of Latina Spanish-speaking women and birthing person participating in CenteringPregnancy. It found that CenteringPregnancy participants had increased odds of vaginal birth and care utilization although not of breastfeeding.
- **Results:** “A total of 487 patient charts were obtained for data collection CenteringPregnancy n = 247, individual n = 240). No differences in low-birth-weight or preterm births were observed between the groups. Compared with women in individual care, women in CenteringPregnancy had higher odds of giving birth vaginally (adjusted odds ratio [aOR], 2.57; 95% confidence interval [CI], 1.23-5.36), attending prenatal care visits (aOR, 11.03; 95% CI, 4.53-26.83), attending postpartum care visits (aOR, 2.20; 95% CI, 1.20-4.05), and feeding their infants formula only (aOR, 6.07; 95% CI, 2.57-14.3). Women in CenteringPregnancy also had lower odds of gaining below the recommended amount of gestational weight (aOR, 0.41; 95% CI, 0.22-0.78).”

- Discussion: “Women and birthing person in CenteringPregnancy had higher health care utilization, but there were no differences in preterm birth or low birth weight. Randomized studies are needed to eliminate selection bias.”