332 Short Interpregnancy Interval

Definition/Cut-off Value

Short Interpregnancy Interval (IPI), formerly known as *Closely Spaced Pregnancies*, is defined as an interpregnancy interval of less than 18 months from the date of a live birth to the conception of the subsequent pregnancy for the following:

Category	Pregnancy
Pregnant Women	Current pregnancy
Breastfeeding/Non-Breastfeeding Women	Most recent pregnancy

Note: The evidence-based information supporting this criterion is specific to live births and did not include women who had miscarriages or stillbirths. Thus, the definition for this criterion is specific only to women who experienced live births. Women whose pregnancies did not result in a live birth may be assigned, as appropriate, Risk #321 *History of Spontaneous Abortions, Fetal or Neonatal Loss*.

Participant Category and Priority Level

Category	Priority
Pregnant Women	I
Breastfeeding Women	I
Non-Breastfeeding Women	III, IV, V, or VI

Justification

Adverse maternal and infant health outcomes have been associated with short Interpregnancy Intervals (IPIs). While there is no standard definition for short IPI, an IPI less than 18 months has been associated with increased risk for adverse outcomes (1, 2). An interval of 18 to 24 months has been associated with the lowest relative risk (2). Evidence associated with the lowest relative risk for an IPI following a miscarriage or abortion is still unclear (see Clarification Section for more information) therefore only health effects associated with a short IPI following a live birth were reviewed for this criterion.

Historically, the World Health Organization (WHO) and other international authorities had recommended at least 2-3 years between pregnancies and the United States Agency for International Development (USAID) had suggested an interval of 3-5 years. Given the inconsistency, various countries and regional programs requested the WHO to further review the research and provide recommendations. As a result, the report from the 2005 WHO Technical Consultation and Scientific Review of Birth Spacing recommended an interval of at least 24 months after a live birth to reduce the risk of adverse maternal, perinatal, and infant outcomes. (3). A more recent review of data suggests that there are increased risks for adverse perinatal and maternal outcomes with an IPI less than 18 months (1, 2 ,4) and increased risks for perinatal (1, 4) and maternal (4, 5, 6) outcomes longer than 59 months while 18 to 24 months was associated with the lowest relative risk (2). Parallel to recent findings, Healthy People 2020 has proposed a 10% improvement in reducing the proportion of pregnancies conceived within 18 months of a previous birth (7).

Outcomes associated with short IPI have included maternal complications such as uterine rupture in women attempting a vaginal birth after a previous cesarean delivery (also referred to as VBAC) (8, 9); and perinatal and neonatal complications such as preterm birth (1, 2, 10), low birth weight (1, 2), small for gestational age (1, 2), birth defects (11), and autism (12, 13).

Short interpregnancy interval has been identified as a risk for increasing uterine rupture in women attempting a VBAC delivery (8, 9, 14). Yet when comparing short interpregnancy interval to labor type – induced labor and spontaneous, there was a decrease rate in VBAC success in women who were induced, and no difference with spontaneous labor (15). Given the lack of a specific IPI recommendation for women with a previous cesarean delivery and the inconsistencies in study designs there appears to be no specific guidelines for interval length after a cesarean delivery (16). The short interpregnancy interval definition cut-off of 18 months, however, appears to be inclusive of women who delivered by cesarean with their previous pregnancy.

Factors contributing to adverse outcomes and short IPI remain controversial. It was thought that socioeconomic factors contributed to adverse outcomes. However, when controlled for possible cofounders, short IPI remained an independent risk factor (1, 2). Nutrition-related hypothetical causal mechanisms have been proposed to explain the effects short IPIs have on health, yet research remains inconclusive (4). The Maternal Depletion Syndrome hypothesized that mothers who have a short IPI often do not have adequate time to replenish macro- and micro-nutrients which may lead to the mother and fetus competing for nutrients (17). However, a recent systematic review of the literature found no evidence to support this hypothesis (4). Studies to support the folate depletion theory have had differing results (11, 18). When folate intake is inadequate, concentrations begin to decrease in the fifth month of pregnancy and for several weeks after birth (19). Women who did not take folic acid supplementation during pregnancy, compared to women who did, were at greater risk of fetal growth restriction with a short (less than six months) IPI and, this risk was found to decrease as IPI increased (18). Of interest, a retrospective Canadian study of 46,243 women found an association between IPI (less than six months) and folate-independent anomalies, however not for folate-dependent anomalies such as neural tube defects, cleft lip and palate, and cardiovascular defects (11). In addition, the association between short IPI and anemia was found inconclusive (2).

Implications for WIC Nutrition Service

Findings from a small pilot study found coordination of primary health care and social support services reduced adverse pregnancy outcomes and the average number of pregnancies conceived within 18 months among low-income African-American who previously delivered a very low birth weight baby (20). Results from a 2007 U.S. survey found that among women of childbearing age, those aged 18-24 years were the least aware of the need for folic acid prior to pregnancy and least likely to report daily use of supplements containing folic acid. Of equal concern, only 17% of women aged 18-24 years were likely to hear about folic acid from their healthcare provider. (21)

Initiations of healthcare referrals for family planning, early prenatal care, and folic acid supplementation have the potential to improve health outcomes for women, infants, and children. Given that half of all pregnancies nationwide are unintended (22), WIC can help to reduce the risk of adverse pregnancy outcomes by:

- Encouraging postpartum women and their partner to meet with their healthcare provider to discuss developing a reproductive plan and birth spacing, as appropriate. http://www.cdc.gov/preconception/documents/rlphealthproviders.pdf

- Encouraging folic acid supplementation. http://www.cdc.gov/features/folicacidbenefits/
- Encouraging healthful eating patterns consistent with the Dietary Guidelines for Americans. http://www.cnpp.usda.gov/DietaryGuidelines

References

1. Conde-Agudeloa A, Rosas-Bermúdez A, Kafury-Goeta AC. Birth spacing and risk of adverse perinatal outcomes: a meta-analysis. JAMA. 2006;295(15):1809-1823.
2. Shachar BZ and Deirdre JL. Interpregnancy Interval and Obstetrical Complications. Obstet Gynecol Surv. 2012;67(9):584-596.
3. World Health Organization. Report of a WHO technical consultation on birth spacing. Geneva, Switzerland, 13–15 June 2005. 2006;1-44.
4. Conde-Agudelo A, Rosas-Bermudez A, Castaño F, Norton MH. Effects of birth spacing on maternal, perinatal, infant, and child health: a systematic review of causal mechanisms. Stud Fam Plann. 2012;43(2):93-114.
5. Conde-Agudelo A, Belizán JM. Maternal morbidity and mortality associated with interpregnancy interval: cross sectional study. BMJ. 2000;321(7271):1255-9.
6. Conde-Agudelo A, Rosas-Bermúdez A, Kafury-Goeta AC. Effects of birth spacing on maternal health: a systematic review. Am J Obstet Gynecol. 2007;196(4):297-308.
7. U.S. Department of Health and Human Services. Office of Disease Prevention and Health Promotion. Healthy People 2020. [cited 2015 Feb 1]. Available from: http://www.healthypeople.gov/2020/topicsobjectives2020/objectiveslist.aspx?topicId=13.
8. Shipp TD, Zelop CM, Repke JT, Cohen A, Lieberman E. Interdelivery Interval and Risk of Symptomatic Uterine Rupture. Obstet Gynecol. 2001;97:175–7.
9. Stamilio DM, DeFranco E, Pare´ E, Odibo AO, Peipert JF, Allsworth JE, et al. Short Interpregnancy Interval: Risk of Uterine Rupture and Complications of Vaginal Birth After Cesarean Delivery. Obstet Gynecol. 2007;110:1075–82.
10. Shachar BZ, Mayo J, Lyell D, Stevenson D, Shaw G. Interpregnancy interval length and risk of preterm birth, a large US study. American Journal of Obstetrics & Gynecology. 2014;210(1)Suppl:S373. Abstract. Poster Session V, Number 760.
11. Chen I, Jhangri GS, Chandra S. Relationship between interpregnancy interval and congenital anomalies. Am J Obstet Gynecol. 2014;210(6):564.e1–564.e8.
12. Cheslack-Postava K, Liu K, Bearman PS. Closely Spaced Pregnancies Are Associated With Increased Odds of Autism in California Sibling Births. Pediatrics. 2011;127(2):246-53.
13. Gunnes N, Surén P, Bresnahan M, Hornig M, Lie KK, Lipkin WI, et al. Interpregnancy Interval and Risk of Autistic Disorder. Epidemiology. 2013;24:906–912.
14. Bujold E, and Gauthier R J. Risk of Uterine Rupture Associated With an Interdelivery Interval Between 18 and 24 Months. Obstet Gynecol. 2010;115(5):1003–6.
15. Huang WH, Nakashima DK, Rumney PJ, Keegan KA Jr, Chan K. Interdelivery interval and the success of vaginal birth after cesarean delivery. Obstet Gynecol. 2002;99(1):41-4.

16. The American College of Obstetricians and Gynecologists, Women's Health Care Physicians. ACOG Practice bulletin no. 115: Vaginal birth after previous cesarean delivery. Obstet Gynecol. 2010;116(NO.2 Pt 1):450-63.

17. King JC. The Risk of Maternal Nutritional Depletion and Poor Outcomes Increases in Early or Closely Spaced Pregnancies. J. Nutr. 2003;133:1732S–1736S.

18. van Eijsden M, Smits LJ, van der Wal MF, Bonsel GJ. Association between short interpregnancy intervals and term birth weight: the role of folate depletion. Am. J. Clin. Nutr. 2008;88(1):147-53.

19. Smits LJ, Essed GG. Short interpregnancy intervals and unfavorable pregnancy outcome: role of folate depletion. Lancet. 2001;358:2074-7.

20. Dunlop AL, Dubin C, Raynor BD, Bugg GW Jr, Schmotzer B, Brann AW Jr. Interpregnancy primary care and social support for African-American women at risk for recurrent very-low-birthweight delivery: a pilot evaluation. Matern Child Health J. 2008;12(4):461-8.

21. Centers for Disease Control and Prevention. Use of Supplements Containing Folic Acid Among Women of Childbearing Age --- United States, 2007. MMWR. 2008;57(01);5-8.

22. Finer LB, Zolna MR. Shifts in intended and unintended pregnancies in the United States, 2001-2008. Am J Public Health. 2014;104: S43–S48.

23. Conde-Agudeloa A, Belizána JM, Bremanb R, Brockmanb SC, Rosas-Bermudez A. Effect of the interpregnancy interval after an abortion on maternal and perinatal health in Latin America. Int J Gynaecol Obstet. 2005;89(1):S34–S40.

24. Love ER, Bhattacharya, Siladitya; Smith NC, Bhattacharya Sohinee. Effect of interpregnancy interval on outcomes of pregnancy after miscarriage: retrospective analysis of hospital episode statistics in Scotland. BMJ. 2010;341:c3967.

25. Bhattacharya, Sohinee; Smith N. Pregnancy following miscarriage: what is the optimum interpregnancy interval? Women's Health. 2011;7(2):139-141.

Clarification

Study results for an optimal Interpregnancy Interval (IPI) following a termination or miscarriage have been inconsistent (3, 10, 23, 24). The WHO Technical Consultation on Birth Spacing Report recommended a minimum interval of at least six months between a miscarriage or induced abortion and the next pregnancy. This recommendation was based on a large retrospective cross-sectional study, a review of 258,108 hospital records from several Latin American countries between 1985-2002, that found women whose previous pregnancy resulted in a spontaneous or induced abortion and had an IPI shorter than 6 months had an increased risk for adverse maternal and perinatal outcomes (21). Given several limitations in the study the WHO cautioned against generalizing the results to other regions or even within the Latin American region since service operations and conditions may differ from the study sample (3). However, more recently a review of approximately a million California births found a decreased risk for preterm birth for women with an IPI of less than six months after a terminated pregnancy (10). An overview of the research found that there may be little benefit from delaying pregnancy after an uncomplicated miscarriage, and to that end pregnancy spacing recommendations following a miscarriage should be individually tailored to the person. (25)