

Appendix 2: Anxiety and stress in Pregnancy

3.1 The Horton HOSC has heard that there is an increased level of anxiety and concern amongst Mother-to-be around the HGH catchment area since obstetrics has been temporarily closed. The committee asked whether there are any impacts of anxiety during pregnancy, the following outlines a small selection of the research related to anxiety during pregnancy. This includes an outline of the positive impacts of reduced anxiety on the birthing process.

Research on impacts of stress (or reduced stress) in pregnancy

Issue	Source	Summary
Stress hormones in Mother are reflected in amniotic fluid	Sarkar P, Bergman K, Fisk N.M, O'Connor T.G and Glover V (2007) Ontogeny of foetal exposure to maternal cortisol using midtrimester amniotic fluid as a biomarker. Clinical Endocrinology, Vol 66, No 5.	Stress experienced by a woman during pregnancy may affect her unborn baby as early as 17 weeks after conception, with potentially harmful effects on brain and development. Higher levels of cortisol (stress hormone) in the mother's blood is reflected in higher levels in the amniotic fluid.
How anxiety in Pregnancy impacts on the foetal brain	Anxiety During Pregnancy: How Does it Affect the Developing Fetal Brain? MGH, Center for Women's Mental Health (2011) https://womensmentalhealth.org/posts/anxiety-during-pregnancy-how-does-it-affect-the-developing-fetal-brain/	The reported study shows that pregnancy anxiety is related to specific changes in brain morphology. High levels of anxiety at 19 weeks of pregnancy were correlated with the volume reductions in several regions of the brain, including the prefrontal, lateral temporal and premotor cortex, medial temporal lobe and cerebellum. The regions most affected by high levels of anxiety are important for cognitive performance, social and emotional processing and auditory language processing.
Link of maternal anxiety to increased rates of ADHD	Van den Bergh B.R.H and Marcoen A (2004) High Antenatal Maternal Anxiety Is Related to ADHD Symptoms, Externalizing Problems, and Anxiety in 8- and 9-Year-Olds. Child Development. Volume 75, No 4	Maternal anxiety levels early in pregnancy -- during the 12 th and 22 nd week of pregnancy -- were strongly linked to ADHD in the children. Even after adjusting for child's gender, parents' educational level, smoking during pregnancy, birth weight, and postnatal maternal anxiety, prenatal anxiety (at 12 to 22 weeks) turned out to be a significant independent predictor of ADHD.
Link of maternal stress to personality disorders in children	Brannigan R, Tanskanen A, Huttunen M.O, Cannon M, Leacy F.P and Clarke M.C (2019) The role of prenatal stress as a pathway to personality disorder: longitudinal birth cohort study. The British Journal of Psychiatry. Vol 190.	Exposure to stress during gestation increases the odds of personality disorder (by three fold) in offspring, independent of other psychiatric disorders. These results suggest the assessment of maternal stress and well-being during pregnancy may be useful in identifying those at greatest risk of developing personality disorder, and highlight the importance of prenatal care for good maternal mental health during pregnancy.

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Link between maternal stress in pregnancy and foetal (neuromuscular and motor) development	Grace T, Bulsara M, Robinson M and Hands B (2015) <i>The Impact of Maternal Gestational Stress on Motor Development in Late Childhood and Adolescence: A Longitudinal Study.</i> <i>Childhood Development.</i> Vol 87, No 1.	Study showed a negative correlation between the effect of maternal stress on neuromuscular and motor development in offspring.
Depression in pregnancy leads to anti-social behaviour in teenagers	Hay D.F, Pawlby S, Waters C.S, Perra O and Sharp D (2010) Mothers' Antenatal Depression and Their Children's Antisocial Outcomes. <i>Childhood Development,</i> Vol 81, No 1.	Depression in pregnancy significantly predicted violence in adolescence, even after adjusting (controlling) for the family environment, the child's later exposure to maternal depression, the mother's smoking and drinking during pregnancy, and parents' antisocial behavior. Mothers with a history of conduct problems were at higher risk to become depressed in pregnancy, and the offspring of depressed women had a greater chance of becoming violent by age 16.
Lack/denial of delivery choice exacerbates tokophobia (pathological fear of childbirth)	Hofberg K and Brockington I (2000) <i>Tokophobia: an unreasoning dread of childbirth. A series of 26 cases.</i> <i>Br J Psychiatry.</i> 2000 Jan;176:83-5. https://www.ncbi.nlm.nih.gov/pubmed/10789333	Pregnant women with tokophobia (pathological fear of childbirth) who were refused their choice of delivery method suffered higher rates of psychological illness than those who achieved their desired delivery method.
Impact of maternal stress in pregnancy and impact on child development	Davis E.P and Sandman C.A (2010) The Timing of Prenatal Exposure to Maternal Cortisol and Psychosocial Stress Is Associated With Human Infant Cognitive Development. <i>Child Development,</i> Vol 81, No 1.	The consequences of prenatal maternal stress for development were examined in 125 full-term infants at 3, 6, and 12 months of age. Maternal cortisol (stress hormone) and psychological state were evaluated 5 times during pregnancy. Exposure to elevated concentrations of cortisol early in gestation was associated with a slower rate of development over the 1st year and lower mental development scores at 12months. Elevated levels of maternal cortisol late in gestation, however, were associated with accelerated cognitive development and higher scores at 12 months. Elevated levels of maternal pregnancy-specific anxiety early in pregnancy were independently associated with lower 12-

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		month mental development scores. These data suggest that maternal cortisol and pregnancy-specific anxiety have programming influences on the developing fetus.
Extended benefits of anxiety on children	O'Connor T. G, Ben-Shlomo Y, Heron J, Adams J and Glover V (2005). Prenatal Anxiety Predicts Individual Differences in Pre-Adolescent Children. <i>Biological Psychiatry</i> 58: 211-217.	Analysis of stress hormone levels (cortisol) in 10 year old children suggested that fetal exposure to prenatal maternal stress or anxiety affects a key part of their babies developing nervous system.
Impacts of reduced stress perinatal on birth		
Reduction in length of labour using hypnosis	Harmon T.M, Hynan M.T and Tyre TE (1990) <i>Improved obstetric outcomes using hypnotic analgesia and skill mastery combined with childbirth education</i> . <i>The Journal of Consulting and Clinical Psychology</i> . Volume 58, Number 5, Pages 525-30.	First time Mother hypnosis for childbirth clients, had an average of 4.5 hours of active labour, compared to 9 hours the average of 9 hours.
Reduction in length of labour using hypnosis	Jenkins M.W and Pritchard M.H (1993) <i>Hypnosis: Practical applications and theoretical considerations in normal labour</i> . <i>British Journal of Obstetrics and Gynaecology</i> . Volume 100, Number 3, Pages 221-226.	Findings showed a reduction in labour with first time Mothers of 3 hours and by 1 hour for Mothers in subsequent births.
Reduction in medication use	Bobart, V. and Brown, D.C. (2002). <i>Medical Obstetrical Hypnosis an Apgar Scores and the Use of Anaesthesia and Analgesia during Labor and Delivery</i> . <i>Hypnos</i> , 29(3), pp.132-139.	Study reported a decrease in the use of medication during labour. Epidurals were used by 97% of the non-hypnosis group and by only 38% of the hypnosis group. Analgesia was used by 75% of the non-hypnosis group, and by only 5.5% of those using hypnosis. 2.7% of the non-hypnosis group had a drug free birth compared with 61% of the hypnosis group. Baby Apgar scores were also significantly higher in the group using hypnosis.

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Use of intervention	Harmon, T.M., Hynan, M.T. and Tyre, T.E., 1990. <i>Improved obstetric outcomes using hypnotic analgesia and skill mastery combined with childbirth education</i> . Journal of Consulting and Clinical Psychology, 58(5), p.525.	reported that a higher than average 81% of first time mums using hypnosis, delivered spontaneously without the use of caesarean, forceps or ventouse.
Reduction in post-partum depression	McCarthy P (1998) <i>Hypnosis in obstetrics</i> . Australian Journal of Clinical and Experimental Hypnosis. Volume 26, Pages 35-42.	After providing 600 women with a 30 minute hypno-birthing session, the study found a virtual absence of postpartum depression compared to an average of 10-15%
Reduction in post-partum depression	Harmon, T.M., Hynan, M.T. and Tyre, T.E., 1990. <i>Improved obstetric outcomes using hypnotic analgesia and skill mastery combined with childbirth education</i> . Journal of Consulting and Clinical Psychology, 58(5), p.525.	Reported a reduced incidence of postnatal depression in women who had been taught hypnotic analgesia for childbirth.

