towards worse maternal morbidity except eclampsia; data outlined in Table 1.

CONCLUSION: MEWT tool use resulted in significant improvement in maternal morbidity. At MEWT sites, individual outcomes moved in the desired direction towards reduced maternal morbidity. These findings were in contrast to a background of significantly worse maternal outcomes at sites not using MEWT. The pilot hospitals births vary from 900 to 3000 annually, suggesting this method may be transferable to maternity centers across the U.S.

Table 1.

	Pre-MEWT	Post-MEWT	Trend	p	Pre-Non-Pilot	Post-Non-Pilot	Trend	p
Deliveries	24221	10701			95718	44638		
Composite Morbidity	(4.5%)	(3.9%)	↓	<0.0001	4.5%	4.9%	↑	<0.001
Eclampsia/1000	2.02	0.37	↓	<0.001	1.12	1.06	↓	0.5
D&C	0.41%	0.26%	↓	=0.03	0.29%	0.39%	↑	<0.01
Hemorrhage	2.94%	2.65%	↓	=0.14	3.2%	3.3%	↑	=0.11
Transfusion	0.7%	0.6%	↓	=0.5	0.7%	0.84%	↑	<0.01
Hysterectomy/1000	2.2	1.7	↓	=0.2	2.1	2.2	↑	=0.9
CDC SMM	1.95%	1.75%	↓	=0.3	2.42%	2.52%	↑	=0.5
Sepsis/1000	0.78	1.3	↑	=0.14	0.26	0.38	↑	=0.2
ICU Transfer/1000	5.0	5.3	↑	=0.7	3.0	3.0		=0.9

8 Males are from Mars, females are from Venus: sex-specific fetal brain gene expression signatures in a mouse model of maternal diet-induced obesity

Andrea G. Edlow[1], Faycal Guedj[1], Deanna Y. Sverdlov[2], Jeroen L. Pennings[3], Caterina Neri[4], Sanaya T. Daruvala[2], Diana W. Bianchi[4]

[1]Tufts Medical Center, Mother Infant Research Institute, Boston, MA, [2]Tufts University School of Medicine, Boston, MA, [3]National Institute for Public Health and the Environment, RIVM, Utrecht, Netherlands, [4]Mother Infant Research Institute, Boston, MA

OBJECTIVE: Maternal obesity (MATOB) is associated with adverse neurodevelopmental outcomes in children, including autism spectrum disorder, developmental delay, and ADHD. Underlying mechanisms remain unclear. We previously identified second trimester amniotic fluid gene expression patterns suggesting dysregulated brain development in fetuses of obese (OB) compared to lean (L) women. Here, we characterized fetal brain gene expression signatures and associated pathways in a mouse model of diet-induced obesity.

STUDY DESIGN: Female (F) C57BL/6J mice were fed a 60% high-fat diet (HFD) or 10% fat control diet (CD) for 10-12 weeks prior to mating. In pregnancy, OB dams continued on the HFD (HFD/HFD), or transitioned to the CD (HFD/CD). L dams stayed on the CD (CD/CD). On embryonic day 17.5, fetal brains were snap frozen. RNA was extracted from male (M) and F brains (10/diet group/sex) and hybridized to whole genome expression arrays. Significantly differentially expressed genes (DEGs) were identified using Welch's t-test with the Benjamini-Hochberg (BH) correction. False discovery rate of 20% was used as a significance cutoff. Functional analyses were performed using Ingenuity Pathways Analysis™ and Gene Set Enrichment Analysis.

RESULTS: MATOB resulted in more dysregulated genes in M (386) vs F (66) fetal brains ($p<0.001$). MATOB was associated with unique brain gene expression signatures for each sex, with overlap of only one gene (Fig 1). Changing OB dams to a CD in pregnancy induced more DEGs in the fetal brain than MATOB alone. Functional analyses identified common dysregulated pathways in both sexes, but MATOB affected different aspects of brain development in Ms vs Fs (Fig 2).

CONCLUSION: MATOB is associated with sex-specific brain gene expression signatures in M and F embryos. Maternal diet in pregnancy significantly impacts the embryonic brain transcriptome. M brain gene expression may be more sensitive to environmental influences during pregnancy such as MATOB and/or maternal diet. It is important to consider both fetal sex and maternal diet when evaluating the effects of MATOB on fetal neurodevelopment.

Figure 1: Number of Differentially Expressed Genes (DEGs) in the Male versus Female Brain in MATOB

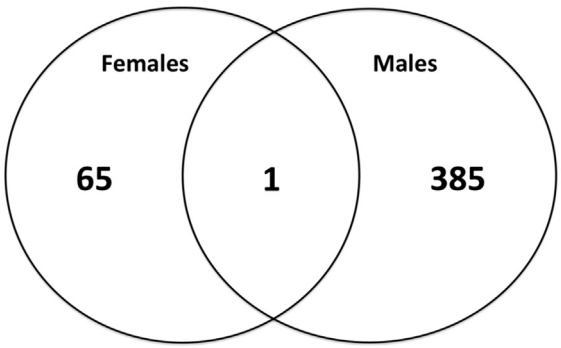

Figure 2: Common and Unique Pathways Dysregulated in the Male and Female Embryonic Brain in MATOB