



## STUDY UPDATE:

### CMV IN PREGNANCY.

More than half of adults carry a virus that seldom causes illness, but CHARM researchers have found a possible link between pregnant women infected with it and autism in their children.

The researchers found that the children of mothers who tested positive for cytomegalovirus, or CMV, during pregnancy were more likely to score higher on a test for autism-like behaviors. Their study was published in the *American Journal of Reproductive Immunology* in 2018. A follow-up study is underway with a larger number of pregnant women.

“We’ll see if our findings hold up with a larger, more-diverse sample,” said Karen Racicot, PhD, formally an assistant professor in the MSU College of Human Medicine’s Department of Obstetrics, Gynecology and Reproductive Biology.

The initial study included 82 women from the ARCH (Archive for Research in Child Health) study, one part of the CHARM research project. Sixty percent of the women tested positive for CMV, and their children were evaluated between the ages of 3 and 6 with the Social Responsiveness Scale-2, commonly used to detect early signs of autism spectrum disorder.

Children whose mothers tested positive for CMV had average scores that were 3.6 to 4.2 points higher than those whose mothers were CMV negative. While the virus lies latent in most people, Racicot suggested the hormonal changes and stress of pregnancy could activate it, causing inflammation in the mother. “We do know that too much inflammation in the mother can affect neurodevelopment of the child in utero,” she said.

“If confirmed by the follow-up study, the finding will demonstrate that common viruses that often are ignored can increase the risk for adverse brain development, especially in those with other genetic and environmental risk factors,” Racicot said.

She cautioned that a positive CMV test does not mean a mother’s child will be autistic, but likely is one of many environmental and genetic factors that combine to increase the risk of developing autism or autism-like symptoms.

“Now we need to really focus on understanding how these different factors interact to have measurable effects on brain development,” Racicot said. “Only then will we be able to identify high-risk pregnancies and improve outcomes by managing modifiable risk factors.”

## PUBLISHED RESEARCH:

### SHOULD YOU EXERCISE WHILE PREGNANT?

After more than 30 years of studying exercise and pregnancy, James Pivarnik has some advice for expectant women: don’t be afraid to engage in moderate physical activity.

Athletic women can continue their workout routines, unless there are “contraindications,” such as a physician’s concern that it could be harmful, he said.

“Most women are not athletes,” said Pivarnik, PhD, a professor in the Michigan State University departments of Kinesiology and Epidemiology & Biostatistics. “If there are no contraindications to walking or similar activities, then do them. Keep it up, and it will lessen a lot of bad things that could happen during pregnancy and delivery.”

Those bad things include pregnancy-related diabetes, high blood pressure and other complications, he said. Leisure-time physical activity also can help control weight gain during pregnancy and make it easier to lose it afterward.

Pivarnik and colleagues have published two based on data gathered from women in the ARCH study, one of the long-term research projects under the CHARM umbrella.

Their study in the *Journal of Midwifery* in 2014 found that women who were overweight or obese before becoming pregnant were likely to gain too much weight during pregnancy. While healthcare providers usually counsel obese women to avoid gaining too much weight, the study suggested that even women who are only overweight also need to be cautioned about it.



A 2016 study Pivarnik and colleagues published in the *American Journal of Lifestyle Medicine*, reached a similar conclusion.

“Those women who gain the most weight during pregnancy tend to keep it on,” Pivarnik said. “The bottom line is if you weigh too much going into pregnancy, don’t gain too much during pregnancy.”

And one more thing: “Every pregnant woman – unless there are reasons that say otherwise – should be able to do 150 minutes of moderate walking every week,” he said.

Are you an ARCH, MARCH, or CHARM participant whose contact information has changed? Please send your new information to:  
Email: [charmstudy@epi.msu.edu](mailto:charmstudy@epi.msu.edu) Telephone: 1-866-925-8758

## WHAT IS CHARM?

Child Health Advances through Research with Mothers, or CHARM, is a coalition of researchers and clinicians from Michigan State University, University of Michigan, Wayne State University, Henry Ford Health System, and the Michigan Department of Health and Human Services.

The goal of CHARM is to improve the health of mothers and children in the state of Michigan.

CHARM has produced two study cohorts. The first one began in 2008 primarily in Lansing, MI and is named ARCH (Archive for Research on Child Health). It stopped recruiting in 2016, but continues to follow participating moms and children. The oldest children are approaching 13 years old.

The second study cohort is called MARCH (Michigan Archive for Research on Child Health). It is modeled upon ARCH, but is designed to represent the population of Michigan. MARCH will recruit from different cities including Flint, Traverse City, Ann Arbor, Grand Rapids, Detroit, and others.

Funders for CHARM include the ECHO Program in the National Institutes of Health, Office of the Director and the Michigan Health Endowment Fund.



## TIPS FOR MOMS:

# COVID-19 PANDEMIC & STRESS.

Pregnancy is stressful enough, even in the best of times—add to that the anxiety caused by COVID-19, and a pregnant woman’s stress level likely will rise considerably.

All that stress could cause adverse pregnancy outcomes, including premature births and underweight babies, said Sarah Comstock, a Michigan State University assistant professor in the Department of Food Science and Human Nutrition. The National Institutes of Health recently awarded Comstock and the rest of the CHARM microbiome working group a grant to study how the added stress of COVID-19 is affecting birth outcomes.

“You don’t necessarily have to come down with COVID for it to have a negative impact on you,” she said.

Comstock’s study will look at the relationship between stress and changes in the mother’s microbiome (the normal bacteria and other microbes that live in a person’s body, particularly in the vaginal canal), which could cause premature births. The study will focus on the perinatal period immediately before and after birth and will look for similar changes in the baby’s microbiome.

“We know that stress can affect perinatal outcomes,” Comstock said, “but we don’t know how adding the pandemic on top of this contributes to adverse outcomes.”

Premature and underweight births can cause delayed brain development in babies and serious health problems later in life. Understanding the connection between stress, changes in the mother’s microbiome and premature births could lead to preventative treatments, such as probiotics like yogurt, Comstock said.

Participants in the study will answer questions about their diet and their perceived stress levels, particularly related to COVID-19. The researchers will gather biological samples from the mothers and babies, including saliva, blood and hair.

“You don’t have to be pregnant to feel stressed by the isolation and other changes brought on by COVID-19,” said Comstock, a mother of three. “I myself am experiencing some of the stress, I can relate – a little bit.”



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Pediatric Cohort

