

## Solving the mystery of early labor

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Pregnant with her first child, Jamie Antisdell was determined to give her baby the best start. She did all the things she was supposed to do, such as exercising, eating well and maintaining a healthy weight. Yet, at 28 weeks, Antisdell's blood pressure soared dangerously high.

Her liver and kidneys began to fail, and she learned her baby girl hadn't been growing properly either. She had to deliver right away. Adali Antisdell was born March 8, 2008, weighing just 1 lb. 15 oz. She had to spend the next two months in [intensive care](#) fighting for her life.

"I was doing everything by the book," said Antisdell, 35, of Sunset Hills. "This wasn't anything I even remotely anticipated happening."

What causes [premature birth](#) - the No. 1 cause of death for newborns and leading cause of lasting childhood disabilities - remains a mystery.

"It's really the No. 1 issue in obstetrics, and we haven't made a lot of progress over the years," said Dr. George Macones, chair of the obstetrics department at Washington University School of Medicine.

To unravel the mystery, the March of Dimes is leading a new approach to studying the problem by establishing a nationwide Prematurity Research Network, which it will help fund with \$75 million over 10 years. The network will be made up of five [research institutions](#), each with a team of diverse scientists focusing on different ideas about the causes of early labor.

On Monday, Washington University School of Medicine was announced as the third member of the network and recipient of \$10 million, which will be matched with local funds from the medical school and St. Louis Children's Hospital Foundation.

"We are investing in an extraordinary effort to bring all the best minds together," said president of the March of Dimes, Jennifer Howse. "The reality is, labor is very complicated. There are lots of contributing factors that trigger labor, and we need to go beyond the sort of traditional means of trying to study this and bring to bear new perspectives, bring together all disciplines and create new tools and technology to get the answers."

Answers were what Antisdell and her husband wanted after the weeks of fear, guilt and desperation they felt with their baby in intensive care.

"It was frustrating, and it was really scary at the same time," she said. "We wanted to continue to grow our family. We asked, 'What are the odds of this happening again?' And they were like, 'We don't know, we just don't know.'?"

Efforts to reduce smoking, enroll women in [health care coverage](#) and stop elective inductions before 39 weeks have helped reduce the [preterm birth](#) rate in the U.S. But there have been only tiny improvements over the past seven years, going from 12.8 percent to 11.4 percent. Among industrialized nations, that places the U.S. at the very bottom.

"These interventions in and of themselves can't get us to the point where we all want to be for the U.S., which is to be one of the top countries in the world for newborn health," Howse said.

As leaders at the March of Dimes pondered this dilemma with their scientific advisers, the idea of the research network came about.

"The conclusion was we are not going to be able to do this unless we understand why women go into labor, and the data is just not there, and the research is just not there," Howse said. "What would it take to mount a national effort to really accelerate the research?"

Stanford University was the first to come on board in 2011 and was a sort of test of the "team science" approach to prematurity research. More than 130 scientists in fields ranging from neonatology and genetics to computer science and artificial intelligence share knowledge, insights, perspectives and analytical tools.

Research at Stanford includes learning how the microbes on the body are disturbed during pregnancy and analyzing data in a way that can identify new patterns or insights.

Two years later, research institutions in Ohio joined together as the Ohio Collaborative to be the second in the network. There, sociologists and psychologists have joined nutritionists and pediatricians in discovering how racial disparities affect preterm birth; and experts in proteomics and reproductive biology are working with obstetricians to study how hormones in the placenta interact to prevent preterm birth. Biologists, physiologists and social anthropologists are helping look at how pregnancy has evolved and discovering new genes that govern pregnancy.

The team at Washington University will be focusing on three areas: using a new imaging technique to look at how the cervix changes during pregnancy, understanding how the electrical activity in the uterus leads to contractions and how disruptions in the sleep cycle influence the onset of labor. The team includes biomedical engineers and cardiologists.

"We are really thinking outside the box in what we can find" to prevent early labor, said Macones, who will lead the effort at Washington

University. "Maybe the uterus can be paced like a heart can be paced, wouldn't that be fantastic?"

Jessica Chubiz, the project manager for Macones' research team, said the scientists included some who have researched birth for decades and some who are brand-new.

"They will focus our approach in new ways and come up with some novel techniques and approaches," she said. "We are kind of starting from scratch in many ways, and that's good."

The fourth member of the network will be announced in the next couple of weeks, Howse said, and the fifth is expected to be on board early next year. The members plan to develop systems for data sharing and meet together quarterly.

Howse said the five institutions "fill out the matrix of areas of investigation," with a total of 30 studies.

Antisdel's daughter is now 6 and lucky in that she doesn't have any of the serious neurological, learning, vision or breathing problems that many premies have.

Antisdel got pregnant again with twins, who were also lucky to avoid stays in intensive care.

But the emotional roller coaster ride was enough to inspire her to raise thousands of dollars over the years for the March of Dimes through the annual March for Babies charity walk, and to speak about her story whenever she can.

"I felt such a strong pull to help the March of Dimes," Antisdel said, "to spread the word about premature birth, raise money for research and to

make sure this doesn't happen to as many people as this is happening to anymore."

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