

Advancing the science of Behavioral Health

Avera Reaching Kids programs designed to change lives through prevention

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Ground-breaking programs through Avera Reaching Kids (ARK) are aimed at providing protection and safety to children, so perhaps one day, no child will feel abandoned to sink or swim in the choppy waters of today's world.

Two programs under the ARK umbrella are Avera Family Wellness, an initiative that is helping children and families now, and the Avera Institute for Human Behavioral Genetics, a scientific research laboratory to unearth solutions for the future.

In collaboration, these programs have the potential to change many lives by limiting the suffering caused by psychiatric illness before it ever starts.

"We're involved with research for the future, as well as projects that are helping kids today," said Ryan Hansen, director of the Avera Institute for Human Behavioral Genetics. The ultimate goal is to keep well children healthy, and intervene for children who are at risk or ill in order to prevent and lessen the effects of emotional-behavioral health conditions in children.

"Behavioral illnesses last an entire lifetime," said Dr. Matthew Stanley, psychiatrist with Avera University Psychiatry Associates. "Imagine being able to develop wellness programs so that people never get ill."

Through the Avera IHBG, scientific research is under way to learn how genes and environment affect childhood behavioral disorders.

"The Avera Family Wellness Program came into existence through the establishment of the Avera Institute for Human Behavioral Genetics," said Ryan Hansen, director of the Avera IHBG. "We had a platform through which we could further our

understanding of emotional-behavioral problems through genetic research. At the same time, we strongly felt we could tailor a program to meet the needs of the local community."

"Our mission is pretty simple," said Dr. James Hudziak, internationally-known child psychiatrist and genetic

researcher, and scientific consultant for the Avera IHBG. "We want to keep well children and families healthy."

Other missional aspects are to protect children and families at risk, and intervene on behalf of those who are ill. While certain genes can predispose people to psychiatric disorders, research

Genetic research will trace susceptibility for illness



Human beings are so different, and yet so alike – 99.9 percent alike to be exact.

Since the sequencing of the human genome was completed in 2000, we now know that human beings are genetically identical by 99.9 percent. The remaining 0.1 percent accounts for all our differences in physical features, as well as susceptibility to different diseases.

"Only a tiny change in our DNA gives us these susceptibilities. We are almost identical, yet some develop diseases and some don't," said Dr. Gareth Davies, director of scientific operations for the Avera Institute for Human Behavioral Genetics.

Dr. Davies, who also serves as assistant professor with the South Dakota State University College of Pharmacy, has a background in unlocking the genetics related to complex diseases, specifically in the area of diabetes.

The development of all diseases, whether it is diabetes or schizophrenia, is believed to stem from genes or changes in genes which make people more susceptible, and environmental factors which trigger those genes, Davies said.

"If you have presence of certain genes or a change in a gene associated with a particular disease, it doesn't diagnose you, it means you are at higher risk if you have a certain trigger or environmental event that could kick off this susceptibility," he said.

Dr. Davies' work will involve testing genetic samples, usually collected through saliva, in research conducted by the Avera IHBG.

Allowing scientists to conduct this testing is advanced technology such as the Applied Biosystems 3130 Genetic Analyzer, which sequences the nucleotide bases within a person's DNA, and the Roche AmpliChip® Cytochrome P450 genotyping test, which helps physicians personalize treatment options according to their genetic makeup.

"If we can identify environmental risk factors and those genes that interact with those risk factors, it would be a phenomenal breakthrough for the field of behavioral disorders," Dr. Davies said. "It's a wonderful opportunity for this area and for psychiatric medicine."

indicates that environmental factors play a role – to either cause a greater risk, or provide protection from illness.

“What we hope is that our genetic knowledge will give us a higher insight into how certain genes interact with the environment,” said Dr. Gareth Davies, scientific director for the Avera IHBG. “We’re not in the business of diagnosing diseases through analyzing genetic regions. We are in the business

of understanding the risk of possessing a genetic makeup, and how that genetic makeup interacts with environmental factors such as stress and parenting.”

“We don’t understand everything about the development of illness yet, but it’s our very strong belief that it is a combination of genetic and environmental impacts,” Dr. Stanley said.

The vision began in the minds of Dr. Stanley and his colleague, Dr. Timothy Soundy, child and adolescent psychiatrist with Avera University Psychiatry Associates, as Avera was planning its state-of-the-art 110-bed Behavioral Health Center, which is now the region’s premier facility for behavioral health services.

“Dr. Soundy and I had the belief and vision that in psychiatry, genetics is going

Both genetic and environmental factors place children at risk



Nature or nurture? Genes or environment? Which are responsible for mental health conditions, such as depression, anxiety, bipolar disease or addiction?

The answer is both, according to Dr. James Hudziak, internationally-known child psychiatrist and genetic researcher, and scientific consultant for the Avera Institute for Human Behavioral Genetics. Hudziak is affiliated with the University of Vermont College of Medicine and Vrije Universiteit at Amsterdam, The Netherlands.

“This gives us the argument for why we do genetic-environmental research,” said Hudziak, as he explained his involvement in a number of published genetic studies covering problems such as attention deficit hyperactivity disorder (ADHD), oppositional defiant disorder, smoking and substance abuse, autism spectrum disorders, anxiety/depression, obsessive-compulsive disorder and juvenile bipolar disorder. “In every instance, we cannot find any illness that’s purely genetic, or any illness that’s purely environmental.”

Hudziak brings with him to the Avera IHBG the premise of using genotyping to bridge the gap between emerging research on gene-environment interaction, and child psychopathy, and implementing that research in clinical community settings.

“We’re never going to have genes that diagnose ADHD, or genes that diagnose depression. We’re going to have genes that tell you the relative risk that the child or family has to develop these outcomes,” Hudziak said.

That understanding can help scientists see which genes and which environmental influences predict risk for, or protection from, psychiatric illness.

The “old genetics” is the understanding that one gene causes one disorder, such as Huntington’s disease, cystic fibrosis or muscular dystrophy.

“These are rare genes causing rare conditions in a small percentage of the population,” Hudziak said.

The “old genetics” has nothing to do with modern medicine, and the study of common conditions such as hypertension, diabetes, obesity – and psychiatric illness. “The old genetics is over. The new genetics involves common genes – genes we all carry that don’t cause illness, but put you at a greater risk,” he said.

So a child with ADHD develops it because he carries the genes, and has some type of environmental trigger.

Environmental risk factors may include varied situations, such as trauma, abuse, conflict in the home, growing up with a depressed mother or even seeing too much violence on TV.

On the other hand, environmental factors such as a peaceful home, involvement in sports and music, good nutrition, and quality family time can protect children from illness.

“Genes matter and environment matters, but in different ways at different times for boys and girls. These sources of variance must be taken into account when treating a child and a family,” Hudziak said.

Psychiatric illnesses have been shown to run in families. A family-based approach means not just treating a child with ADHD individually, but also assessing all members of the family.

By improving the home environment, parents may be able to improve the health of their children. In some cases, if a parent is treated, perhaps for depression, her child may get better without any treatment at all.

“We do this work because we’re devoted to developing strategies to reduce the suffering of children and families. These are medical conditions influenced by gene and environmental factors. They are not someone’s fault,” Dr. Hudziak said. “We predict our work will lead to new diagnostic and treatment strategies to help children, families and communities.”

to play a larger and larger role. It is a new field – a field that no one has cornered,” Dr. Stanley said.

The physicians shared their vision with Fred Slunecka, Avera McKennan regional president, who also saw the possibilities. “It’s an exciting prospect. Together we can build a stronger framework for social health. Together we can design a better prevention and treatment approach for children and families with psychiatric disorders,” Slunecka said. A commitment from Avera McKennan of \$1.5 million over three years is supporting the project, along with grants and contributions from philanthropic donors.

Drs. Stanley and Soundy heard a conference presentation by Dr. Hudziak, who connected with the idea, and agreed to work as a consultant on the project. Together, the team has shaped and honed the vision.

“We see ourselves providing a service to the community immediately, but at the same time drawing research out of it so that our efforts will have an even greater impact in the future,” Dr. Stanley said. Ultimately, this work could change the way psychiatrists treat patients.

Psychiatrists and psychologists at the Avera Behavioral Health Center provide the best care the field of psychiatry is able to offer, Dr. Stanley said. “But there are still people who are very sick.

I would love to be able to see people early enough, and have enough information from their genetic profile to be able to prescribe an environmental change so they will be well.”

Research has immediate community benefits

The Avera Family Wellness Program is impacting kids today while gaining research insight for the future.



At no cost to families, the voluntary program combines positive activities like Suzuki violin lessons with family coaching for children enrolled in early childhood programs in the Sioux Falls School District.

The program was piloted in 2008-09 at Garfield Elementary School. After a successful first year, the program will be expanded in 2009-10 to include 160 Head Start children and their families at Hayward Elementary.

Research indicates that activities like music, dance and drama can positively impact brain development to enhance learning, as well as emotional and social growth.

The Suzuki method helps children focus and play music at a very young age. Using scaled-down instrument sizes and simple standing and holding techniques, children can study music before they learn to read.

Family health coaches are available as a resource to help parents improve their family’s health and wellness, and hone parenting skills. The process empowers parents to become aware, take charge, discover solutions, and make choices toward a more successful family life.

The goal is to prevent or lessen the effects of behavioral health conditions that may already be present, or that may develop later in life. “The Avera Family Wellness Program is an opportunity to see if non-pharmaceutical methods like music or expressive therapies make a difference,” said Dr. Timothy Soundy, child and adolescent psychiatrist with Avera University Psychiatry Associates.

Theory holds that positive environment decreases the likelihood that behavioral illness like depression or attention deficit hyperactivity disorder will develop, even if children have a genetic predisposition.

If proven, this research could bring about new approaches to mental health treatment and prevention. “If not, we have done no harm. We’re giving every child a chance,” Dr. Soundy said. “We believe we will see results.”

Any child in the program identified to have behavioral issues is referred to appropriate therapists or child psychiatrists for early intervention. “There is a huge benefit for detecting problems with these youngsters at an early age,” said Dr. Nicole Christenson, psychiatrist with Avera University Psychiatry Associates and Avera Family Wellness Program psychiatrist. “If we can intervene in preschool we know they will go into kindergarten more smoothly. When they move on to the grades beyond, they will be able to keep building on the coping skills they’ve learned. Kids who do well in school do well as adults.”

It is hoped the strategies used in the Avera Family Wellness Program will serve as preventive medicine, and protect children from the negative effects of behavioral health conditions. “The benefit of investing in this program is that we are helping families become more healthy and successful,” Dr. Christenson said.



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