Hasbro study finds link between adverse childhood experiences and pediatric asthma

Children who experience violence, substance abuse at home report significantly higher rates of asthma

PROVIDENCE – **ROBYN WING, MD**, an emergency medicine physician at Hasbro Children's Hospital, recently led a study that found children who were exposed to an adverse childhood experience (ACE) were 28 percent more likely to develop asthma. The rate of asthma occurrence further increased in children with each additional ACE exposure. The study, recently published in the *Annals of Allergy, Asthma & Immunology*, suggests that psychosocial factors may contribute to pediatric asthma.

"Asthma is one of the most common chronic childhood conditions, currently affecting 7 million, or 9.5 percent, of children in the U.S.," said Dr. Wing. "The biological risk factors for asthma onset and severity, such as genetics, allergens, tobacco smoke, air pollution and respiratory infections, have been well established by previous studies. But, psychosocial factors, such as stress, which we know can be physically harmful, are now being examined as a risk factor for asthma in children."

Dr. Wing's team analyzed data from nearly 100,000 children and teens in the 2011-2012 National Survey of Children's Health and compared parent or guardian reports of a child having asthma to whether a child had experienced an ACE at home. An ACE is classified as whether a child has ever:

- Lived with a parent or guardian who got divorced or separated while child was present.
- Lived with a parent or guardian who died.
- Lived with a parent or guardian who served time in jail or prison while child was present.
- Lived with anyone who was mentally ill or suicidal, or severely depressed for more than a couple of weeks.
- Lived with anyone who had a problem with alcohol or drugs.
- Saw or heard parents, guardians or any other adults in the home slap, hit, kick, punch or beat each other up.

Children exposed to one ACE had a 28 percent increase in reported asthma compared to those with no ACEs. These rates increase with each additional ACE, with children exposed to four ACEs having a 73 percent increase in reported asthma.

Most prior asthma studies have focused on neighborhood and urban-related issues, such as family poverty, poor quality housing and access to community resources. But, disruptive family relationships within the home can be a significant source of psychosocial stress for children.

"Psychosocial stressors activate the sympathetic nervous system, which controls our 'fight or flight' responses when we experience stressful situations," said Dr. Wing. "Increased activity of this system releases cortisol, a stress hormone, which has been shown to affect the activity of immune cells. Occasional increases in these hormones are protective, but excessively high or prolonged exposures, such as those experienced by children exposed to ACEs, can be harmful."

Dr. Wing hopes this study, and others like it, will underscore the complex causes of asthma, enabling clinicians to better target preventative medications and other interventions. "Physicians taking care of children with asthma should take the time to ask about the child's home situation," said Dr. Wing. "For children experiencing stressors at home, encouraging efforts to increase the child's capability of handling stressors, using methods such as individual or family therapy, may help target pediatric asthma."

She continued, "Stress should be viewed as a risk factor for asthma development and asthma exacerbations, much like tobacco smoke and dust mites. At the very least, clinicians can share with parents the impacts of ACEs on their child's asthma, perhaps acting as a motivating factor for parents to remove or shield a child from a stressful home situation." ❖

Compassion unleashed with Memorial Hospital's new Pet Therapy Program

PAWTUCKET – The Center for Rehabilitation at Memorial Hospital of Rhode Island has launched a pet therapy program to enhance the environment of care for patients of all age levels.

KEITH RAFAL, MD, MPH, chief of rehab and medical director of the Center for Rehabilitation, said, "Memorial Hospital's pet therapy program is a special way we show compassion for our patients, their families and hospital staff."

Pet therapy is a guided interaction between a patient and a trained animal. It also involves the animal's handler. Therapy dogs are family pets, not service dogs like those that assist the disabled. These dogs are obedient and deal well

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with different situations and enjoy meeting people.

Memorial's program is offered to patients on the Center for Rehabilitation, both in the therapy area and patient rooms. Susan Higgins, owner/handler of her pug dog, Bridget, currently visits Memorial's rehab patients once a week for one hour. Bridget has been a therapy dog for the past six years.

Dr. Rafal adds, "You can feel the joy and see the smiles that our lovable volunteers bring to all."

The owners ensure their animals meet all the standards set by Therapy Dogs International, Inc. for medical pet therapy, including providing licensing, credentialing and general liability insurance. ❖

Pictured left to right in The Center for Rehabilitation at Memorial Hospital, Susan Higgins, owner/handler of Bridget, therapy dog, visiting with William Black, a rehab patient and Providence resident, and Keith Rafal, MD, MPH, chief of rehab and medical director of the Center for Rehabilitation.

URI engineering students develop wristband to measure tremors in PD

KINGSTON – For the 4 million people worldwide with Parkinson's disease, a smart wristband invented by a team of University of Rhode Island engineering students could let them lead healthier lives.

Known as TeleTremor, the wristband uses high-quality motion sensors to detect tremors and movement difficulties in people with Parkinson's disease and send the information over a secure Internet connection to doctors. Though innovative visualizations, TeleTremor enables neurologists to make more informed decisions by measuring the effect of prescribed medications and progression of the disease.

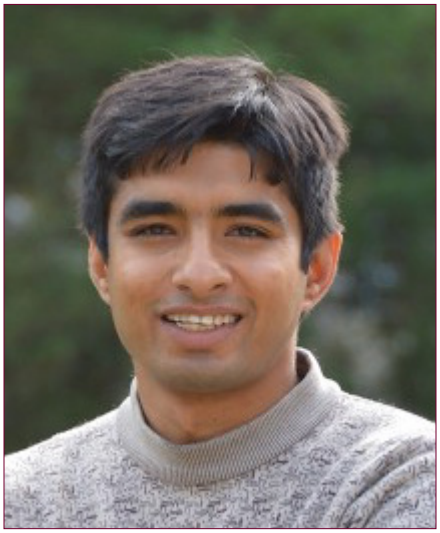
URI

URI engineering students showcase TeleTremor at the International Undergraduate Global Health Technologies Design Competition.

Biomedical engineering student **TREVOR BERNIER**, computer engineering student **JOSEPH TUDINO** and electrical engineering student **AKINTOYE ONIKOYI** teamed up to design the system and build a prototype.

In March 2015, they garnered international exposure as one of 23 finalists at the International Undergraduate Global Health Technologies Design Competition at Rice University in Houston.

"TeleTremor is a product of URI's continuous efforts toward nurturing excellence, leadership, innovation and real-world experience through collaboration in our next generation of engineers who are acquiring the right skills for today's highly dynamic marketplace," says **KUNAL MANKODIYA**, an assistant professor of biomedical engineering who supervised the team.



URI

URI's Kunal Mankodiya, an assistant professor of biomedical engineering, supervised the team.

It's not the first time Mankodiya and his students have leveraged smart technology to improve patient care. Another team of students is working on a smartphone system that can monitor vital signs and send the information to doctors over the Internet. It's all part of the college's push to connect education with improving lives. ❖