Akron Children's Hospital

The extraordinary journey to discovery.

REBECCA D. CONSIDINE RESEARCH INSTITUTE
2014 ANNUAL REPORT

Our mission: Unlocking the power of research to advance knowledge and improve lives.

Core values:

Respect for all persons involved in the research process.

Dedication to improve lives and provide access to investigational therapies and technologies.

Collaboration with any person or organization involved in research.

Responsibility to build upon our knowledge and skills to provide the resources and services necessary to educate and assist those engaged in the pursuit of research.

Innovation and discovery to advance healthcare knowledge by exploring novel ideas, methods or devices as we learn from the past to define the future.

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To stay informed of research activities at Akron Children's and the Rebecca D. Considine Research Institute, subscribe to Research Pursuits, our e-newsletter. Read our current and past issues at akronchildrens.org/cms/pursuits/. Visit akronchildrens.org/pursuitssignup to subscribe.

From our founders

Dear Friends,

There is saying that success is a journey, not a destination.

At Akron Children's Hospital, we have a different take on this adage: Success is a journey and a destination. Each destination is a groundbreaking discovery reached through the efforts of our hospital investigators.

We're delighted that our hospital embraces research because what we learn today improves the health of children tomorrow.

While our researchers work individually on many initiatives, each investigation adds to the body of medical knowledge and, taken together, our research efforts have the power to transform pediatric care on a global scale. That's why innovators from across the country and around the world choose to partner with us – and why parents choose to bring their children here for care.

The staff of the Rebecca D. Considine Research Institute has been on a journey to create a hub for the research activities taking place throughout our hospital system.

Dr. Michael Reed has been crucial to the institute's founding. His guidance helped transform the institute into a well-established enterprise. While nurturing alliances with national and international partners, he has remained focused on finding new ways to help our patients.

Dr. Reed is retiring in 2015. We're grateful for his service and wish him all the best. He will be missed.

As we look to the future, we're excited about the expansion of research activities at our hospital. We extend our heartfelt appreciation to all our investigators, who work tirelessly to improve pediatric healthcare. This collective pursuit of knowledge, innovation and discovery will continue to fuel improvements in the way we care for children throughout northern Ohio – and beyond.

Thank you for your compassion and commitment.

Sincerely,

William H. Considine
President and CEO,
Akron Children's Hospital

Rebecca D. Considine

From our director

Dear Friends,

The journey to discovery requires a dogged determination to answer significant clinical questions in pediatric medicine.

Questions like: Can we prove the value of a new, radiation-free method to correct cardiac arrhythmias? How might we use computer modeling to validate respiratory ventilator performance? Could exercise testing lead to an improvement in diagnosing and treating debilitating diseases? How can technology help us embrace new avenues of education and research?

You'll discover how Akron Children's investigators are seeking answers to these questions and others in this year's annual report.

The Rebecca D. Considine Research Institute was founded in 2009 to fulfill the mission of encouraging, advising and supporting Akron Children's team of investigators.

With a growing staff of research professionals – clinical coordinators, biostatisticians, regulatory specialists and others – we have a diverse team that can leverage their expertise to support hospital investigators conducting research studies. In the last 6 years, the number of clinical studies has tripled. Akron Children's investigators continuously convey their study findings to the medical community through peer-reviewed journal publications and presentations at national and international conferences. We also established research partnerships and collaborate regularly with other pediatric hospitals, academic institutions and industry leaders on a regional, national and global basis.

Akron Children's investment in research is leading to discoveries that improve the health and well-being of children in our own backyard and beyond. This year's report reflects these achievements and more as we work toward improving pediatric care.

On a personal note, 2014 marks my final year at Akron Children's Hospital. As I look forward to spending more time with family, I will miss the stimulating collaborations I've enjoyed with the hospital's talented investigators.

Akron Children's leadership remains committed to enhancing the Rebecca D. Considine Research Institute's foundation. I look forward to celebrating future achievements of the institute and Akron Children's superb investigators as they work together to advance pediatric healthcare for many years.

Sincerely,

Michael Reed

Michael Reed, PharmD, FCCP, FCP
Director, Rebecca D. Considine Research Institute

Absence makes the heart grow stronger

Surgical database substantiates a revolutionary, radiation-free approach to pediatric cardiac catheter ablation procedures

John Clark, MD, is pioneering a safer future for children with heart rhythm abnormalities – one that's free of radiation.

Through the creation of an international surgical database, Dr. Clark, director of Akron Children's arrhythmia center, and 6 partner institutions are identifying ways to eliminate radiation exposure in children who undergo cardiac catheter ablation procedures. Their findings could establish a new international standard for the way ablations are conducted.

"This is the richest, most robust data set that exists for this procedure in children worldwide, and it's the first of its kind," says Dr. Clark. "There's a wealth of information to be mined."

An accidental discovery

Traditionally, fluoroscopy – a form of X-ray – has been the primary imaging tool used to localize catheters within the heart during an ablation procedure. But, as Dr. Clark notes, it's not ideal.

"Radiation poses risks to both patients and medical staff," he says. "It's important to limit its use, especially in children, since they have more years during which the side effects could manifest, particularly malignancies."

In 2005, the fluoroscopy unit in Akron Children's catheterization lab broke. The only piece of equipment Dr. Clark had was a 3-D mapping system – a relatively new technology he started using in 2003 as a backup imaging tool to fluoroscopy.

"It was then that I asked myself, 'Do I need to use fluoroscopy at all?'" says Dr. Clark. "I had this new system that showed real-time 3-D catheter localizations within the heart without radiation. It also helped map the heart quicker and ablate faster. But nobody had done this before."

Using a 3-D mapping system, Dr. Clark virtually eliminates radiation exposure during cardiac catheter ablation procedures.

Once the fluoroscopy unit was operational, Dr. Clark put his theory into practice and used the 3-D modeling system as his primary imaging tool. He discovered that fluoroscopy was rarely needed.

"We were able to virtually eliminate the use of radiation in these procedures utilizing 3-D mapping, except in very rare cases."

Between December 2005 and October 2014, Dr. Clark performed 609 cardiac ablations. Only 2 required fluoroscopy. Physicians around the world started traveling to Akron Children's to learn how to perform the procedure, and approximately a dozen U.S. hospitals adopted the non-fluoroscopy policy.

But Dr. Clark wanted to see widespread use.

"By using 3-D mapping technology instead of fluoroscopy, it's possible to reduce radiation during ablation procedures by 95 to 98 percent across the board," says Dr. Clark. "But the only way we can get there is through collaboration. I can present the results of a few hundred patients I've operated on at a national conference, and people may take notice. But, if I get my colleagues to join me, and we can present thousands of patients from multiple institutions, then people really have to start considering the fact that this is coming and it's the only way to perform these procedures moving forward."

Creating the CAREFL database

In 2011, Dr. Clark met with Don Wachsberger, MS, database manager at the Rebecca D. Considine Research Institute, and Stefan Agamanolis, PhD, associate director of the research institute, to see if there was a way to create a system in which practitioners worldwide could input their results and outcomes of the new ablation practice.

"From that meeting, the CAREFL database was born," says Dr. Clark.

CAREFL, or Catheter Ablation and Reduction or Elimination of Fluoroscopy, is an international database that tracks demographic data and procedural outcomes of cardiac catheter ablation procedures using 3-D mapping instead of fluoroscopy. Wachsberger worked closely with Dr. Clark and Agamanolis to develop it.

"We selected software offering several features well-suited to the medical technology and geographic diversity of the user community," says Wachsberger. "Each location is self-contained within the overall database to help protect patient records. So, a hospital in Turkey can enter data at the same

Read more about Dr. Clark's work with the CAREFL database at bit.ly/CAREFL.

time as hospitals in the U.S., and each is assured that their data will not be disclosed to other institutions."

As of November 2014, more than 1,500 adult and pediatric patients had been entered into the database from Akron Children's and 6 other participating locations, including:

- Advocate Illinois Masonic Medical Center in Chicago, IL
- Mattel Children's Hospital UCLA in Los Angeles, CA
- Miteria Children's Hospital in Athens, Greece
- C.S. Mott Children's Hospital in Ann Arbor, MI
- Providence Sacred Heart Medical Center and Children's Hospital in Spokane, WA
- Mehmet Akif Ersoy Hospital in Istanbul, Turkey

Thus far, the database shows that more than 70 percent of patients undergoing an ablation receive zero fluoroscopy, which indicates significant changes for the standard of pediatric care. Compared to a national standard set in 2004, the CAREFL database averages show a 95 percent decrease in radiation exposure and a 38-minute reduction in procedure time.

As Dr. Clark presents the preliminary results and outcomes of the CAREFL database, he hopes to open it to more hospitals while looking for additional opportunities to use the information that's collected.

"The collaborative effort of the database has created a wave of change within the field of catheter ablation relative to radiation exposure, but the tsunami is still to come," says Dr. Clark. "The information we collect will change everything."

Breathing new life into respiratory care

Investigator's 20-year mission to improve the efficacy of care in mechanically ventilated patients

"Can we make it better?" "Is there a way to study it?"

Teresa Volsko, MHHS, RRT, FAARC, has built a career on these two questions – both as a respiratory therapy expert and an investigator.

"I joke with my family that I should have been an engineer," says Volsko, director of respiratory care and transport at Akron Children's Hospital. "I like to see how things work and fit together, and how I can improve them."

Volsko's inquisitive nature has led to a prolific 20-year career in respiratory care research – 32 published studies, 6 active investigations, 60 abstracts accepted for conference presentation, 2 published monographs, 6 book chapters and an adjunct professorship at Rush University in Chicago. In December, she received honors from the hospital's Nursing Research Council for her contributions to nursing and healthcare research.

She also published her first textbook and recently completed the hospital's first respiratory scholars program, a competitive mentorship and educational opportunity. In addition, she serves as faculty advisor for graduate students enrolled in the respiratory care program at Rush University.

Volsko's work has made a major impact on the care delivered to patients at Akron Children's and beyond.

"We want to be able to provide the best possible care to our patients – no matter what," says Volsko. "Research is fundamental in helping us accomplish this."

Volsko's work in respiratory care research aims to find a better way to care for patients, such as a study testing a new method to confirm endotracheal tube placement.


MAQUET
MAQUET
Servo

Employing computerized modeling in respiratory system research

The respiratory care field relies heavily on different types of medical equipment, such as ventilators, to care for patients.

"We've found when equipment is manufactured, it doesn't always perform the same way clinically as it did in laboratory tests," says Volsko. "It's important to test these devices in different patient populations, because the same equipment can perform differently depending on a patient's condition."

One of the ways Volsko and her team conduct this testing is through computerized modeling – a system that uses the equation of motion to mathematically mimic what's happening within the respiratory system. It gives Volsko and her team a physiological representation of what's happening to a patient, rather than depending on more primitive mechanisms to act as a lung.

Recently, Volsko and 2 students from Rush University used this method to examine the efficacy of 5 portable ventilators intended for home mechanical ventilation after a patient is removed from an ICU ventilator. They discovered that all the devices reacted differently in a normal patient state than a diseased state. One even contained a software glitch that could have caused significant patient harm.

The results from this investigation helped launch 4 new studies for Volsko and her team. One includes a case series led by respiratory therapist Nhi Haines, in which she uses computerized modeling to transition medically complex patients from an ICU ventilator to a portable ventilator. By modeling the patient's pulmonary characteristics, the most appropriate ventilator settings can be selected in the lab. A process that usually took days now takes less than an hour.

"That's one of the things I enjoy most about research," says Volsko. "The results you yield from one investigation can serve as the platform for a new wave of studies."

Reducing radiation risks – optoacoustic detection of the endotracheal tube depth

Repeated exposure to X-ray has the potential to create long-term health risks for pediatric patients. To reduce this hazard for intubated children with endotracheal tubes, Volsko and Michael Bigham, MD, FAAP, medical director of transport services at Akron Children's Hospital, are collaborating with Donald Prough, MD, and his team of engineers at the University of Texas Medical Branch.

Learn more about Volsko's work in computerized modeling for respiratory system research: bit.ly/RCModeling.

“Right now, the standard for determining whether an endotracheal tube is placed in the correct spot in a patient’s airway is by taking an X-ray,” says Volsko. “The new method we’re testing could potentially allow us to eliminate repeated X-ray use to confirm endotracheal tube placement.”

Volsko and her team are using a prototype that uses a pulse laser generated by a device attached to a small fiber. Using a guide wire, the fiber is inserted down a patient’s endotracheal tube. The laser then sends signals to a probe placed at the base of the patient’s throat. The information from the signals lets physicians and respiratory therapists know where the top of the tube is located so they can determine if it’s in the right location.

“Akron Children’s is the pediatric alpha site for taking this prototype from safety and efficacy into a clinical investigation,” says Volsko. “I’m fortunate to be working on such cutting-edge research with a great team of medical professionals.”

A strong partnership

As Volsko moves forward on these and several other investigations, she relies on her close partnership with the Rebecca D. Considine Research Institute.

“The research institute professionals have become an invaluable part of my research team,” says Volsko. “We rely on them for statistical consultation and support. They’re instrumental in helping us with study design and new product development. They also helped us establish our respiratory scholars program.”

“We’re fortunate to be an institution where research is embraced,” says Volsko. “As our work continues to grow, so will our exposure on a national and international level. It’s an exciting time to be an investigator at Akron Children’s.”

A step in a new direction

Exercise testing in children – a hidden potential

Imagine what it would be like to breathe through a narrow straw – all day, every day.

That's how many people describe living with Cystic Fibrosis (CF), a serious genetic disease that affects the pulmonary and digestive systems.

According to the Cystic Fibrosis Foundation, approximately 30,000 people in the U.S. suffer from CF. Patients frequently experience interruptions of their lung function, known as exacerbations, which require hospitalizations and specialized treatments. For children with CF, maintaining a functional level of fitness is one key to a more normal, healthier life.

Now, Rajeev Bhatia, MD, FAAP, pediatric pulmonologist and medical director of the clinical exercise physiology lab at Akron Children's Hospital, is conducting research to determine how an exercise assessment called the six-minute walk test can better evaluate the overall health of CF patients, including the disease's progression and effectiveness of treatments.

"One of my favorite quotes is from author Thomas Berger: 'The art and science of asking questions is the source of all knowledge,'" says Dr. Bhatia. "Research is that art and science of asking questions, helping us to uncover real results that can affect the lives of our patients."

Making a case for the six-minute walk

The current standard to assess CF patients' progression, exacerbation and improvement with treatment is pulmonary function testing, which measures how well the lungs are working. However, this form of testing only measures lung function, which may not tell the full story.

"Many times, we see patients with low breathing numbers, but they don't feel bad. Or, they feel bad but their breathing numbers are normal," says Dr. Bhatia.

Exercise testing can help physicians gain a broader picture of a cystic fibrosis patient's overall health, fitness level and disease progression.


Inpatient Pharmacy

This is where exercise testing can fill the gap.

"When children exercise, they're activating multiple organ systems – pulmonary, cardiovascular, musculoskeletal, neuropsychological and more," says Dr. Bhatia. "Exercise tests like the six-minute walk help us gain the picture of the overall health, fitness level and disease progression in CF patients, because we're measuring more than just lung function."

The six-minute walk test is simple. Patients walk a "track" of 100 feet as fast as they can for six minutes. The child's vital signs, including oxygen level and heart rate, are measured before and after the test. Those measurements, in correlation with the distance traveled, indicates a patient's current health and functional capacity.

Putting a test to the test

During his fellowship at Children's Hospital Los Angeles, Dr. Bhatia conducted his first published six-minute walk test study. That investigation followed CF patients admitted to the hospital for an exacerbation who completed a six-minute walk test, a pulmonary function test and a validated quality-of-life questionnaire. The tests were given at the time of admission and again at the end of the first and second weeks in the hospital.

"We concluded that the six-minute walk test was safe and well-tolerated, and could be used as an adjunct or alternative outcome measure in CF patients hospitalized for exacerbation," says Dr. Bhatia. "It also indicated that multiple outcome measures, like the exercise test and quality-of-life questionnaire, should be used to assess the effectiveness of treatment and guide clinical decision making."

Now, Dr. Bhatia is expanding the scope of this research in a yearlong study of patients with moderate to severe CF. Starting March 2015, Dr. Bhatia began administering the six-minute walk test, pulmonary function test and quality-of-life questionnaire to participants each time they visit the hospital's Lewis H. Walker, MD, Cystic Fibrosis Center or undergo an admission. Dr. Bhatia hopes that by testing and monitoring these patients year-round, he will gain an even clearer picture of their exacerbation periods.

"Our goal is to try to detect the gradual decline in lung function so we can intervene earlier with effective treatments," says Dr. Bhatia.

Watch Dr. Bhatia discuss his work with exercise testing in children who may have mitochondrial myopathy: bit.ly/exercisetest.

Discovering a new potential for exercise testing

In collaboration with Bruce H. Cohen, MD, division director of neurology at Akron Children's Hospital, Dr. Bhatia is expanding his research using cardiopulmonary exercise testing to uncover its potential in helping children with another serious disease: mitochondrial myopathy.

"Mitochondrial myopathies are diseases caused by malfunctioning mitochondria, a part of the cell that generates energy," says Dr. Bhatia. "It can cause symptoms ranging from mild weakness to debilitating illness."

In contrast to the mild pace of the six-minute walk test, cardiopulmonary exercise testing requires a maximal effort from the patient.

"In our clinical exercise physiology lab, we have the patient exercise at full exertion on a treadmill or bike," says Dr. Bhatia. "During the exercise, we measure multiple parameters related to the heart, lungs and muscles. This may uncover abnormalities that might go unnoticed in regular tests."

"This testing may serve as an inexpensive and non-invasive method of diagnosis and assessing whether a treatment for the illness is effective," adds Dr. Cohen.

Together, Dr. Cohen and Dr. Bhatia are examining the role of exercise testing in the diagnosis and evaluation of children and adults with mitochondrial myopathy. Dr. Bhatia hopes their collaborative work will provide guidance on using exercise testing to diagnose the disease and measure therapeutic outcomes.

"Akron Children's is among a handful of centers worldwide performing cardiopulmonary exercise testing on patients with mitochondrial myopathy," he says. "We are also one of few nationally to participate in an upcoming drug trial on these patients to assess their exercise capacity and other outcomes."

With support from the Rebecca D. Considine Research Institute, Dr. Bhatia expects these and other investigations will continue to position Akron Children's as a world-class research organization.

"When growth in research occurs, it allows our hospital, our patients and our community to thrive. I can think of no better outcome for our work."

Bringing innovation to education

One surgeon's mission to enhance learning and training opportunities through pioneering technology

For Todd Ponsky, MD, FACS, the future of pediatric surgery lies in education.

"The days of textbooks are over," says Dr. Ponsky, pediatric surgeon at Akron Children's Hospital. "The way we get much of our information is through mobile apps, YouTube videos, podcasts and more. The problem is that this trend hasn't caught up within medical education."

With this shifting approach to information sharing, Dr. Ponsky focuses on using technologies to provide continuing education in pediatric surgery.

"Internet- or screen-based virtual education is starting to take on a bigger role," says Dr. Ponsky. "Surgeons around the world – including those of us at Akron Children's – will no longer be limited by budgets or geographic barriers. Instead, we'll be able to purposefully use technology to gain the ongoing education we need."

Turning the operating room into a virtual classroom

Education plays a crucial role in keeping surgeons apprised of advances and emerging techniques in their field.

"The training a surgeon receives in residency is tightly regulated," says Dr. Ponsky, who also serves as an associate professor of surgery and pediatrics at Northeast Ohio Medical University. "By the time they graduate, they have a strong knowledge base."

However, once a surgeon finishes this training, there is no established method for learning new techniques.

The solution, Dr. Ponsky believes, lies in a new form of virtual mentorship called telementoring. Telementoring connects a surgeon skilled in a new surgical technique to a surgeon who is less experienced, allowing a procedure to be taught under close instruction, guidance and observation. The benefit? Much of this can take place virtually.

Dr. Ponsky is pioneering the future of medical education by using new and emerging technologies that help support his efforts through channels such as GlobalCastMD, which conducts interactive medical symposia via the Internet.


Pediatric Surgery

"Telementoring presents an exciting opportunity," says Dr. Ponsky. "It allows us to leverage the know-how and skills of our colleagues around the world, even if they can't physically be in the room with us."

In telementoring, when a surgeon must learn a new technique, he or she first meets with an expert and observes the procedure being performed in the operating room. Next, the expert travels to the surgeon and assists in performing the technique. Finally, the expert watches the surgeon perform the procedure to ensure they are skilled. With new technology, this third observation can happen virtually. The expert can weigh in when needed – even making annotations on the video screen.

Becoming a telementoring authority

Thanks to Dr. Ponsky's efforts, Akron Children's is becoming an international telementoring leader. In 2014, the hospital's pediatric surgery staff participated in 15 such cases, assisting surgeons from Colorado to France. Most recently, Dr. Ponsky completed a project in Tromsø, Norway, where he instructed a group of surgeons on how to perform a new laparoscopic technique.

"I first performed a case that was broadcast virtually, and the team in Norway observed. Then I flew to Norway, where I performed the case again. For the next two days, I was with the team in the operating room, offering guidance or input, while they performed the technique. After I arrived back in the U.S., I telementored four additional cases. The project was a complete success. We're now in the process of publishing our work and results."

While Dr. Ponsky notes that there is much interest in the potential of telementoring, there's still much that needs to be defined.

"We need to make this model sustainable," says Dr. Ponsky. "Logistics, finances and liability concerns all need to be considered as we move forward. But, so many in our field view telementoring as a valuable necessity. We look forward to creating a model for success."

New technology avenues

As telementoring gains more traction, Dr. Ponsky looks for additional technology methods that further ongoing education.

With the assistance of his research and fellowship team at Akron Children's, he is currently producing a state-of-the-art video "atlas" – an interactive, online teaching book. Unlike a printed book, the digital atlas allows for real-time updates of the latest surgical techniques and advancements.

With 24 open research investigations, Dr. Ponsky is one of the most active investigators at Akron Children's. Much of his work centers on developing new techniques for minimally invasive surgery procedures.

"Research is what makes the biggest impact on our field," he says. "I love finding ways to save or treat hundreds or thousands of children worldwide rather than just one patient at a time."

"The book's chapters focus on specific surgical teaching subjects, such as appendectomies," says Dr. Ponsky. "Each chapter will contain audio, text and video instructions from two experts in the field. They will walk learners through the procedure, stopping and starting the video while making annotations – all captured on screen."

It's a more interactive form of education that Dr. Ponsky and his team hope to complete within the next three years.

Another opportunity involves leveraging the scope and reach of GlobalCastMD, which conducts interactive medical symposia via the internet. This engaging format connects pediatric physicians and specialists from across the globe for discussion of various topics.

"It's a more advanced and entertaining form of education," explains Dr. Ponsky. "Instead of a standing lecture, we have an interactive dialogue about a particular topic. We talk, debate and answer questions from the audience, who call in from all over the world."

In addition to the symposia, he and his team are creating a series of hour-long podcasts. Made up of five-minute "blurbs," each podcast provides a summary of approximately 12 key articles that have been published within the last six weeks.

"People don't have time to sit and read a full scholarly journal," notes Dr. Ponsky. "These podcasts offer medical professionals a chance to get updated on the most current information in pediatric medicine while they're driving to and from work each day. We've already created 10 that are available on iTunes®."

As Dr. Ponsky continues his efforts, he hopes to see a trend in using advanced media technology for ongoing education.

"It truly is the future of our hospital, our field and the health and well-being of children around the globe."

Making an impact

Key accomplishments

From the number of studies to new collaborations, 2014 marked a year of growth and advancement for the Rebecca D. Considine Research Institute.

99 peer-reviewed journal publications

16 authored by nurses

411 **IRB-approved open studies** as of December 31, 2014

45 open studies with nurse principal investigator

5 open studies with respiratory therapist principal investigator

Rebecca D. Considine Research Institute staff

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Lee Cramer
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Victoria Drummond
Department Secretary

Bill Van Nostran, BS
Medical Communications Specialist

Diane Wolski, BSN, RN
Clinical Research Coordinator

2014 Research Funding

Federal and State Government Grants

The following includes a representative sample of significant external grants that are funding research in select pediatric specialties.

STUDY TITLE	PRINCIPAL INVESTIGATOR	FUNDING SOURCE
Neonatal Intensive Care Unit (NICU)		
Neonatal Abstinence Syndrome: Research to Enhance Efficacy and Cost-Effectiveness of Treatment	Jennifer Grow, MD	Ohio Department of Job & Family Services
		University Hospitals – Cleveland
Prophylactic Phenobarbital After Resolution of Neonatal Seizures	Jennifer Grow, MD	NIH: Eunice Kennedy Shriver National Institute of Child Health and Human Development
		University of Rochester Medical Center
NeuroDevelopmental Science Center		
Amitriptyline and Topiramate in the Prevention of Childhood Migraine	Maria Cristina Victorio, MD	NIH: National Institute of Neurological Disorders and Stroke
		Children's Hospital Medical Center of Cincinnati
North American Mitochondrial Disease Consortium	Bruce Cohen, MD	NIH: National Institute of Neurological Disorders and Stroke
		Trustees of Columbia University in the City of New York
Vascular Effects of Infection in Pediatric Stroke	Abdalla Abdalla, MD	NIH: National Institute of Neurological Disorders and Stroke
		University of California San Francisco
Pediatric Intensive Care Unit (PICU)		
Genetic Epidemiology and Immune Response of Life-Threatening Influenza Infection in Young Adults	Ryan Nofziger, MD	NIH: National Institute of Allergy and Infectious Diseases
		Boston Children's Hospital
Genomic Analysis of Pediatric Systemic Inflammatory Response Syndrome (SIRS) and the Pediatric Biomarker Risk Model	Michael Bigham, MD	NIH: National Institute of General Medical Sciences
		University of Cincinnati Children's Hospital Medical Center
Pharmacology and Toxicology		
Antibiotic Safety in Infants with Complicated Intra-abdominal Infection	Michael Reed, PharmD, FCCP, FCP	NIH: Eunice Kennedy Shriver National Institute of Child Health and Human Development
		Duke University
Identification of New Mechanistic Biomarkers of Adverse Response to Acetaminophen	Michael Reed, PharmD, FCCP, FCP	NIH: National Institute of Diabetes and Digestive and Kidney Diseases
		Arkansas Children's Hospital Research Institute
Safety and Pharmacokinetics of Multiple Dose Intravenous and Oral Clindamycin in Pediatric Subject with BMI > 85th Percentile	Michael Reed, PharmD, FCCP, FCP	NIH: Eunice Kennedy Shriver National Institute of Child Health and Human Development
		Duke University
Robert T. Stone, MD, Respiratory Center		
Ohio Pediatric Asthma Repository	Samantha Gunkelman, MD	Ohio Department of Job & Family Services
		University of Cincinnati Children's Hospital Medical Center
OPTIMIZing Treatment for Early Pseudomonas Aeruginosa Infection in Cystic Fibrosis	Gregory Omlor, MD	NIH: National Heart, Lung, and Blood Institute
		Cystic Fibrosis Foundation Therapeutics
		Seattle Children's Hospital
Vision Center		
Convergence Insufficiency Treatment Trial – Attention Reading Trials	Richard Hertle, MD	NIH: National Eye Institute

2014 Research Funding

Akron Children's Hospital Research Foundation Awards

Thank you to generous donors who contributed to the Rebecca D. Considine Research Institute and Akron Children's Hospital Research funds. Your support makes a direct impact on our work, allowing us to advance pediatric care. For more information or to make a donation, visit us online at akronchildrens.org/research.

STUDY TITLE	INVESTIGATORS	AWARD
A Rabbit Model of Laparoscopic Pediatric Inguinal Hernia Repair to Evaluate Suture Materials	Todd Ponsky, MD	$15,000
Magnet Anastomosis for Treating Esophageal Atresia in a Pig Model	Todd Ponsky, MD	$15,000
The Neighborhood Context of Elevated Blood Lead Levels in Summit County, Ohio Using a Fine-scale Geospatial Approach	Joel Davidson, MD	$15,000
Understanding the Mechanisms of Mitochondrial Disease: A Transformative Approach from the Patient to Cell and Back to the Patient	Bruce Cohen, MD, William M. Chilian, PhD	$15,000
The Patient-Centered Medical Home Model and Pediatric Emergency Department Utilization in Northeast Ohio	Cooper White, MD	$1,200
Testing the Feasibility and Effectiveness of the Cellie Coping Kit for Injury in Children Who Have Experienced a Mild or Moderate TBI	Sarah Ostrowski, PhD, Meghan Marsac, Dalin Pulsipher, MD	$7,000
Continuous vs. Bolus Nasogastric Feeding in Mechanically Ventilated Pediatric Patients Phase 2 (COBO Phase 2)	Ann-Marie Brown, PhD, CPNP-AC/PC, CCRN, FCCM	$15,000
Peripheral IV Placement by Nursing with Ultrasonography in the Pediatric Emergency Room	Alia Hamad, MD	$3,200
TOTAL		**$86,400**

Stimulating research through education

Last year, 584 hospital investigators, clinicians, staff and students took advantage of educational opportunities and learning experiences provided by the Rebecca D. Considine Research Institute.

2014 education, training and outreach highlights

- **Translational Science Seminars.** Six Akron Children's investigators and 2 guest speakers explained how their research findings are advancing pediatric healthcare. Topics ranged from "Biomaterials as Building Blocks for Personalized Medicine" to "Does in With the Good Equal Out With the Bad? Application of Nutrition Support Research Learning." Nurses received continuing education credits for attending. WebEx recordings of these seminars are on the hospital's website at: akronchildrens.org/cms/translational_science_seminar_series_archive/index.html.
- **Making Sense of Statistics Seminars.** Research institute biostatistician Mira Brown, MS, offered monthly classroom presentations on the fundamentals of statistics to new and mid-level researchers.
- **Pediatric Emergency Medicine (PEM) fellows statistics preparation.** Research institute biostatistician Neil McNinch, MS, RN, launched an 18-hour curriculum to prepare PEM fellows for the statistics requirement of their board certification examination.
- **Biostatistics content-focused training.** Institute staff created training presentations to meet the educational needs and interests of several disciplines:
    - Medical Education Resident's Orientation
    - Palliative Care Departmental Meeting
    - Summer Pediatric Research Scholars
    - Fellowship Training Program
- **Writing assistance for fellows, residents and nurses.**
    - Held a seminar for fellows and residents on how to write an abstract.
    - Provided individual writing consultations for fellows and residents submitting Research Day abstracts.
    - Organized a writing workshop for nurses.
- **Summer Pediatric Research Scholars (SPRS).** During the 10-week program, 15 college students conducted a research study at Akron Children's. Mentored by hospital investigators, students also benefitted from learning opportunities throughout the hospital.
- **Nurse Scholar Program.** Participants advance nursing science through discovery, fostering nursing practice innovations and improvements. In 2014, Key Bank presented a $15,000 grant to support our nationally recognized Nurse Scholar Program.

Committed to our community

In 2014, our small team at the Rebecca D. Considine Research Institute made a big impact on the lives of those around us by contributing to a number of charitable events and fundraisers.

- **The 2014 Akron Heart Walk.** Last year, we participated in and raised funds for the annual event benefiting the American Heart Association. Our staff developed creative ways to collect donations, including a $5 "jeans day" and selling treats and afternoon snacks through our new mobile snack cart – the Crash Cart.
- **Akron Children's 29th annual Kids Are #1 Run and Family Fun Day.** At the institute's sponsored table, we created a display of microscopes and unique medical slides, giving kids and parents a special glimpse inside the world of a clinical researcher.
- **Carter's Crash Course for Juvenile Diabetes.** Several institute coordinators participated in this 1.5 mile race featuring obstacle courses, interval exercises and more. The event raised funds for the American Diabetes Association.
- **Bakers for Builders.** In July, we made baked treats for the construction crews working on the Kay Jewelers Pavilion – our hospital's new medical building.

Staff education

To live up to the mission and vision of the Rebecca D. Considine Research Institute, our staff must maintain a high level of professional excellence through lifelong learning. In 2014, we participated in a range of formal educational programs.

- **Blue Belt Certification.** The entire research institute staff completed the Center for Operational Excellence Blue Belt Program. During 6 hands-on training sessions, the team learned Lean Six Sigma concepts and tools to eliminate waste, improve productivity and streamline institute processes. We received our Blue Belt designation in early 2015.
- **2014 research institute educational accomplishments.** Throughout the year, our staff completed 6 individual continuing education learning sessions on a range of topics focusing on study design and research trial ethics.

RESEARCH INSTITUTE STAFF EDUCATION
Confidentiality Agreements and Research Study Budgets
Regulatory Compliance
The Protocol: A Roadmap to Research Navigation
Protecting Human Subjects: The IRB, Consent, Assent and Privacy Protection
Biostatistical Services, Basics of Building a Spreadsheet, and Introduction to Summary Statistics
Preparing for an FDA Audit

Nursing Research Council (NRC)

The NRC consists of nurses with various levels of research expertise who have an interest in conducting clinical research studies at Akron Children's. Formed in 2013, the NRC offers resources and support to nurse investigators through the Rebecca D. Considine Research Institute's Nursing Research Center.

2014 members

- Laurel Celik, BSN, RN, NCSN – chair
- Rebecca Heyne, DNP, RN, CPNP, CNE, WCC – vice chair
- Aris Eliades, PhD, RN, CNS – quality advisor
- Lisa Aurilio, MSN, MBA, RN, NEA-BC
- Nancy Aho, CNS
- Lauren Archer, RN
- Pam Baker, MSN, MBA, RN, PCNS-BC
- Ann-Marie Brown, PhD, CPNP-AC/PC, CCRN, FCCM
- Jean Christopher, MSN, RN, CNS, WCC
- Maria Dixon, RRT
- Kimberly Firestone, BS, RRT
- Marilyn Frazier, RN, CNOR
- Jean Frisone, BSN, RN, CPN
- Jane Holloway, BSN, RN
- Neil McNinch, MS, RN
- Phyllis Mesko, RN, CPN
- Mary Mondozzi, MSN, BSN, RN
- Nancy Mosca, PhD, PNP-BC, PHCNS-BC, NCSN
- Chris Sadie, BSN, RN
- Teresa Volsko, MHHS, RRT, FAARC
- Connie Teal, MSN, RNC-NIC, PCNS-BC, WCC
- Meghan Weese, MSN, RN, CPN
- Diane Wolski, BSN, RN
- Natalie Yost, BSN, RN

Nursing Research Grand Rounds

In December 2014, the Nursing Research Council and Professional Development Council hosted the annual Nursing Grand Rounds highlighting nursing research. Nurse Scholars presented studies and the first-ever Excellence in Nursing Research Awards were announced. The group also recognized Key Bank for its $15,000 grant to the Nurse Scholar Program.

2014 Pediatric Nursing Research Grant Award

Nancy W. Mosca, PhD, PNP-BC, PHCNS-BC, NCSN, director of our nursing professional practice, received a $1,800 Akron Children's Pediatric Nursing Research Grant Award to support a study titled "Transitioning from Open Ward to Single-Patient Room Neonatal Intensive Care Units: Effect of NICU Design on Staff, Neonates and Families."

2014 Akron Children's investigator videos

The Research Insight video series gives Akron Children's the opportunity to highlight the work of its investigators.

Visit akronchildrens.org/cms/research_insights/index.html to view last year's videos, which include:

Improving cystic fibrosis patient outcomes through research
Gregory Omlor, MD
Director, Pulmonary Medicine and Sleep Center

Reducing posterior spinal fusion deep surgical site infections
Todd Ritzman, MD
Pediatric Orthopedic Surgeon

Cardiopulmonary exercise testing in children with mitochondrial myopathy – a unique study
Rajeev Bhatia, MD
Pediatric Pulmonologist

Summer Pediatric Research Scholar Study: Language in preschoolers with autism spectrum disorder
Stephanie Marie Darm, SPRS Class of 2014

Megan Cook, SPRS Class of 2010
Research Assistant, Family Child Learning Center

Subscribe to Research Pursuits

Research Pursuits is the institute's digital newsletter for the pediatric research community, donors, community leaders, academia, friends and colleagues. Read our current and past issues at akronchildrens.org/cms/pursuits/.

To subscribe, visit akronchildrens.org/pursuitssignup.

Meet the team behind the team

Behind every investigation, there's a group of professionals vital to its success. At the Rebecca D. Considine Research Institute, they're our research study coordinators and nurses.

Research study coordinators help support sponsored studies, as well as individual investigator research projects. Throughout all phases of a study, they partner with principal and sub-investigators to coordinate and manage activities, such as:

- Recruiting, screening and enrolling participants.
- Obtaining informed consent.
- Scheduling tests and procedures.
- Collecting data.
- Ensuring accurate documentation.
- Maintaining databases.
- Coordinating study monitor inspection visits.

Clinical research nurses help our institute and our investigators achieve a balance between patient care and a commitment to protocol. In addition to study coordinator duties, research nurses provide patient care while working with the principal investigator. Their other responsibilities include:

- Effectively enrolling participants.
- Performing study-related clinical procedures.
- Administering study medications.
- Developing and using case records.
- Accurately collecting and documenting data.

Akron Children's Hospital

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