



WOMEN & CHILDREN'S HOSPITAL OF BUFFALO

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A Kaleida Health Facility

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PHYSICIANS ON A MISSION

It is my pleasure to introduce this publication from Women & Children's Hospital of Buffalo, *Physicians on a Mission*. The medical staff at Women & Children's Hospital of Buffalo is committed to the highest quality of patient care, clinical outcomes, and developing innovations in the field of pediatrics. I would also like to share some very exciting physician appointments, new recruits and development plans that are enhancing the care we provide in Western New York and beyond.

In early 2010, Teresa Quattrin, MD was appointed as Chair, University at Buffalo Department of Pediatrics and Kaleida Health Clinical Chief of Service for Pediatrics. As the major teaching hospital of University at Buffalo's School of Medicine, our patients and families will benefit from Dr. Quattrin's leadership. She will strengthen care delivered by our comprehensive team of pediatric specialists. In addition, Dr. Quattrin will continue to serve as Chief of the Division of Pediatric Endocrinology and Director of the Women & Children's Hospital of Buffalo Diabetes Center.

I am also happy to report that Women & Children's Hospital of Buffalo has welcomed several new physicians that will expand other clinical offerings. Teresa R. Hennon, MD, from the University of Wisconsin School of Medicine and Public Health, established a new pediatric rheumatology service. Peter Gambacorta, D.O. returned to Western New York after completing his training at Children's Hospital Boston through Harvard Medical School and has been named Medical Director of Pediatric & Adult Sports Medicine. Also, Kathryn D. Bass, MD, FACS, FAAP, has been named Director of Trauma at Women & Children's Hospital of Buffalo.

A Physician Steering Committee lead by Michael G. Caty, M.D., Surgeon-In-Chief, and comprised of more than a dozen physicians representing a broad section of the specialties have proposed the construction of a new Ambulatory Surgery Center on the Buffalo Niagara Medical Campus. With construction expected to begin in 2011 and be completed within 18 months, plans include a state-of-the-art facility meeting the highest possible clinical, environmental and structural standards.

Women & Children's Hospital of Buffalo has also made significant investment in other areas of the hospital. The enhanced Hematology/Oncology Unit will provide additional and improved accommodations for patients and their families who often experience frequent and extended admissions, while addressing the special needs those in our Bone Marrow Transplant program. The Pediatric Intensive Care Unit expansion will include eight new beds bringing the total to 28 Pediatric Intensive Care beds.

Our nursing and other clinical and support staff at Women & Children's Hospital of Buffalo also have many proud accomplishments. On behalf of all of them and our patient families, I'd like to share with you this edition of *Physicians on a Mission*.

Sincerely,

Cheryl A. Klass
President



Women & Children's Hospital of Buffalo has been a regional, national and international leader in providing comprehensive and specialized care to women, children and infants for nearly 125 years. A partnership with the University at Buffalo School of Biomedical Sciences has allowed the hospital to offer its patients the latest medical advancements available. Women & Children's Hospital of Buffalo also serves as the teaching site for University at Buffalo Medical School and has trained hundreds of physicians practicing across the county.

Dr. Drucy Borowitz

Dr. Drucy Borowitz is Director of the Cystic Fibrosis Center; Professor of Pediatrics, University at Buffalo School of Medicine and Biomedical Sciences; and attending physician of the Pediatric Pulmonology Division, Women & Children's Hospital of Buffalo.

PEDIATRIC PULMONOLOGY:

Cutting-edge research and care in Cystic Fibrosis

One of the first centers of its kind in the United States, the Cystic Fibrosis Center at Women & Children's Hospital of Buffalo has always been at the vanguard of patient care, research, and education. Composed of a multidisciplinary team of medical professionals, the Center strives to provide exemplary family-centered care to patients, to participate in research for the improvement of care and treatment, and to educate patients, families, the medical community, and the public about the disease. The Buffalo Center is presently one of just 118 nationally accredited CF centers in the country and one of 77 accredited therapeutic development network centers.

Working to control the disease

Cystic Fibrosis (CF) is a genetic disease that affects approximately 30,000 people in the United States. With CF, a defective gene causes the body to produce abnormally thick and sticky mucus. The mucus clogs the lungs and obstructs the pancreas, as well as impacting other organs, making breathing and food absorption difficult. According to the Cystic Fibrosis Foundation's National Patient Registry, the median age of survival for a person with the disease is approximately 36 years.

"Our goal, as a CF Center, is to control and cure CF," says Dr. Drucy Borowitz, M.D., CF Center Director. "That's what's important to patients—to promote a longer life and a good quality of life."

Early diagnosis; improved intervention

Early and correct detection make a tremendous and positive impact on patient care. Before 2002, when New York State began newborn screening (NBS), children were diagnosed through symptoms. Today, individuals identified by NBS are diagnosed with CF if they have an elevated sweat chloride level or if they have inherited disease-causing mutations in the CF transmembrane conductance regulator (CFTR) gene. Detection is, however, not as straightforward as it might seem. Mutations in the CFTR gene can cause CF, but not all mutations are disease-causing. Infants identified by the NBS program in whom CF cannot be clearly diagnosed or ruled out are given the designation CFTR-related metabolic syndrome (CRMS). Under the leadership of Dr. Jack Sharp, who heads up NBS for Western New York, the Buffalo Center led the way in helping to define standards for care of infants with CF and with CRMS, a definition now used by the CF Foundation and other facilities involved in NBS. As of 2011, all 50 states had implemented NBS.

Quality care all along the way

The Center serves the eight counties of Western New York, and has both a pediatric and adult program, providing continuity of care throughout a patient's lifetime. Dr. Borowitz leads the pediatric program; Dr. Michael Aronica is the Adult Program Director. A team of physicians, coordinators, a dietitian, respiratory therapists, a social worker, a genetic counselor, a psychiatrist, physical therapists, and pharmacology staff make up the pediatric and adult teams.

Finding ways to improve patient care is always at the forefront of the Buffalo Center's work. Under the directorship of Mary Kontos, MSN, PNP, and Kimberly Rand, MSW, a Parent-Patient Advisory Council was founded to help in the redesign of patient care. The Center uses a microsystems-based approach to quality improvement (QI). In 2007-2008, it received a national award recognizing its outstanding QI processes and accomplishments.

Looking for a breakthrough

Bringing new treatments into the clinical realm through research directly better the lives of those affected by CF. Since the early 1990s, the Buffalo Center has been involved in over 30 clinical trials, led by Nadine Caci, RNC, CCRC, senior research coordinator. As part of the CF clinical research network, researchers have been looking at a completely new way to intervene with genetic illness. Investigations are underway to find a molecule to change the CFTR protein; one study is currently in Phase 3, the last phase before seeking FDA approval. "Our hope is that this will be a breakthrough in treatment," says Dr. Borowitz.

Also showing early promise is a novel technique in which a small device called the SmartPill is used to measure the acidity of the gastrointestinal (GI) tract; CF affects the pH in the GI tract. This groundbreaking work could represent a big step forward in care. The SmartPill Corporation is a Buffalo-based company on the Buffalo-Niagara Medical campus.

Center recognition

The work carried out at the center has not gone unnoticed. In 2008, The Stephen P. Holesko Fund was established by Stephen and Joan Holesko in memory of their son to support the Cystic Fibrosis Center at Women & Children's Hospital of Buffalo. The Fund helps working families that are struggling with the expenses associated with caring for a child with CF and, starting in 2011, it will support the Center's annual Family Education Night.

Improving outcomes

The success of multidisciplinary care at the Buffalo Center is reflected in its clinical outcomes, which are among the best in the country, according to data compiled by the National Cystic Fibrosis Foundation.

Measures of pulmonary and nutritional status are the strongest predictors of future health in people with CF. For the measure of lung function (FEV1), the percentage predicted for patients 18 to 29 in 2009 (the most recent data available) at Women & Children's Hospital of Buffalo was 82; the national median was 70. The measure of body mass index (a nutritional indicator) for patients age 20 or older treated by the Buffalo Center in 2009 was 23.3; the national median for BMI was 21.9. For both measurements, the higher number value demonstrates better outcomes.

Dr. Drucy Borowitz sums up the reasons for the positive and ever-improving outcomes: "We have employed quality improvement



methods and family-oriented care to help us achieve the best possible clinical outcomes for our patients. We are also active participants in many research studies, and are at the forefront of some exciting new drugs that have the potential to change the course of CF."



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Dr. Teresa Quattrin

Dr. Teresa Quattrin, M.D., is Chief, Division of Endocrinology/Diabetes at Women & Children's Hospital of Buffalo; Chief of Service, Pediatric Medicine for Kaleida Health; and Professor of Pediatrics at the University at Buffalo School of Medicine.

PEDIATRIC ENDOCRINOLOGY:

National and international impact for Type 1 Diabetes

As the only pediatric center of its kind in Western New York, The Diabetes Center at Women & Children's Hospital of Buffalo follows approximately 1,100 patients who have been diagnosed with Type 1 and Type 2 diabetes, a number that continues to increase year after year.

Dr. Teresa Quattrin, who has headed up the Center in Buffalo since 1990, notes the dramatic increase in new patients each year—about 10 percent per year with Type 1 diabetes and 20 percent per year with Type 2 diabetes—a statistic that makes the Center's purpose all the more pressing.

"We've been collaborating in nationwide efforts aimed at diabetes prevention for more than 20 years and our center is part of a national effort to find new strategies to treat and prevent diabetes," says Dr. Quattrin.

Community outreach

Although commonly thought of as an "adult" form of the disease, Type 2 diabetes "is now diagnosed in children at an alarming rate," says Dr. Quattrin, "due in large part to the epidemic of childhood obesity." A team of seven Board Certified pediatric endocrinologists, a nurse practitioner, a certified diabetes educator (CDE), three nurses, two registered dietitians, and a part time social worker make up the Center's team that cares for children in this population.

Dr. Quattrin and her colleagues at the University at Buffalo are testing a novel, family-based weight-control program targeted toward preschoolers at risk of becoming overweight; the program is implemented in regional pediatricians'

of the community to bring improvements to Buffalo and Western New York through the study and treatment of diabetes. A prime example of such partnerships is the \$1.5 million endowment established at Women & Children's Hospital of Buffalo Diabetes Center by The Seneca Diabetes Foundation. The Seneca Diabetes Foundation is a private foundation tasked with providing funding for research and education in diabetes with appropriate cultural focus on the Seneca population. With the help of this endowment, the Women & Children's Hospital of Buffalo Diabetes Center will perform research and further enlarge the scope of their program aimed at assisting the Seneca population, a significant proportion of whom are affected by diabetes.

National and international impact

Community is a broad term, and the Center networks not only within Western New York, but also well beyond, making an impact both nationally and internationally. TrialNet is

an international study funded by multiple sources, including the NIH; its focus is to find interventions that will prevent or delay the onset of Type 1 diabetes. Twenty-two major affiliate clinical centers in the United States, Canada, Europe, Australia, and New Zealand are taking part, and Dr. Quattrin is the Principal Investigator of the Buffalo Center, which is affiliated with Columbia University.

"This study is significant because it focuses on family members of

those with Type 1 diabetes, who are at greater risk than the general population," says Dr. Quattrin. Overall, one in 400 individuals is at risk of developing Type 1 diabetes; that risk increases to one in 100 if a sibling has been diagnosed.

Study participants are screened for the antibodies involved in pancreatic demise and, if positive, they enter the second phase of the study, which involves measuring their risk of developing the disease within five years. Those at high risk may take part in clinical

trials aimed at preventing disease onset, such as the ongoing trial on oral insulin.

"Being selected as a clinical site for this study and being so successful in identifying and screening individuals at high risk for Type 1 diabetes is a result of the long-term commitment to the community by the Diabetes Center at Women & Children's Hospital of Buffalo," said Cheryl Klass, RN, MBA, President, Women & Children's Hospital of Buffalo.

"If diabetes can be delayed, even for a few years," says Dr. Quattrin, "those at risk may be able to postpone the challenges of controlling their glucose levels and the development of serious complications," which include eye and kidney damage.

Women & Children's Hospital of Buffalo is one of only 150 medical centers in the United States, Canada, Europe, and Australia participating in this study, which is supported by the Juvenile Diabetes Research Foundation and the American Diabetes Association.

Center of Excellence

In 2006, The New York State Department of Health designated the Center in Buffalo as a "Type 2 Diabetes Center of Excellence." Women & Children's Hospital of Buffalo is the only pediatric center among the five centers in the state to be designated as such. With the recognition came a \$500,000, five-year grant to identify ways to prevent and diagnose Type 2 diabetes in children and adults.

A broader scope

In addition to its focus on the prevention and treatment of diabetes, The Division of Endocrinology/Diabetes Center at Women & Children's Hospital of Buffalo is one of the top centers in the U.S. The center provides comprehensive care to those affected by endocrine disorders, such as short stature, thyroid conditions, precocious puberty, adrenal disorders, and disorder of sexual differentiation. It is the region's only center certified as a Newborn Screening referral center for Congenital Hypothyroidism and Adrenal Hyperplasia.



offices. With the support of a \$2.55 million grant from the National Institutes of Health (NIH), Buffalo Healthy Tots is partnering with pediatric health care providers in Buffalo and Western New York to pioneer this novel approach, the aim of which is to set new ways for pediatricians throughout the United States to prevent and treat obesity in young children.

Serving the local community

The Center is also working in tandem with the University at Buffalo and other members

PEDIATRIC NEONATOLOGY:

Research and clinical advancements in neonatology

Research and clinical work go hand in hand at the Division of Neonatology, which is part of the Department of Pediatrics at Women & Children's Hospital of Buffalo. The advances made through research in the Division bring about direct improvements in the care of the hospital's youngest, and perhaps most vulnerable patients.

The focus of the Division's research is three-fold: to study how best to deliver critical care to babies with respiratory depression at birth and reduce oxygen toxicity; to discover the optimum management of newborns with persistent pulmonary hypertension (PPHN); and to further the treatment of necrotizing enterocolitis (NEC), a gastrointestinal disease that disproportionately affects pre-term infants.

Facilitating a child's best start in life

To date, physicians from the Division in Buffalo, (Drs. Kumar, Mathew, and Lakshminrusimha) have received four grants from the American Academy of Pediatrics to study neonatal resuscitation.

An asphyxiated infant enters this world limp, apneic, and cyanotic, and requires immediate resuscitation. Yet the effects of resuscitation with varying levels of oxygen on pulmonary hemodynamics at birth are not well known. It is understood, however, that hyperoxic ventilation can cause oxidant injury and contribute to the worsening of pulmonary hypertension in newborns.

At present, investigators at the Division are conducting research focused on neonatal resuscitation and finding the optimum oxygen concentration to be used during resuscitation. These studies are far from theoretical, as timely and appropriate resuscitation at birth can mean the difference between death, survival with neurologic impairment, and in fact, survival.

Finding better ways to manage PPHN

During fetal life the lungs are not required for gas exchange, so pulmonary blood flow is low and pulmonary vascular resistance (PVR) is high. When the fetus adjusts to its new world at birth, its pulmonary circulation undergoes a striking transition, characterized by an 8- to 10-fold rise in pulmonary blood flow and a similarly significant decrease in PVR. When this transition does not occur spontaneously, the result can be persistent pulmonary hypertension of the newborn (PPHN), a condition associated with significant morbidity and mortality.

Traditional treatment for intractable PPHN that does not respond to mechanical ventilation and inhaled nitric oxide is Extra Corporeal Membrane Oxygenation, or ECMO, in which an oxygenator acts as an artificial heart and lungs. While it is a life-saving technique, ECMO is also highly invasive. "Our aim is to try and reduce the need for ECMO by promoting pulmonary blood flow and improving oxygenation with various pharmacological agents in PPHN," says Dr. Satyan Lakshminrusimha, Associate Professor of Pediatrics.

Currently under evaluation by the Division is the role of anti-oxidants and antenatal/postnatal steroids on fetal lung fluid, pulmonary hemodynamics and surfactant release.

Another alternative treatment being studied that shows early promise is that of Sildenafil. The Division is presently involved in a five-center trial, the end goal of which is to evaluate the use of this medication in the treatment of PPHN.

Studies into NEC

Necrotizing enterocolitis, which can cause destruction of the intestines, is extremely rare in healthy newborns. Among pre-term hospitalized infants, however, it is the most common and serious gastrointestinal disorder diagnosed. In collaboration with Dr. Michael Caty from the Department of Pediatric Surgery, Dr. Lakshminrusimha and his colleagues are currently investigating the role of mesenteric vasculature in the pathogenesis of necrotizing enterocolitis.

World-class research facility

Researchers at the Division are well placed to undertake their research. Working at a facility that is almost unique in this country, investigators are able to create various disease models in pre-term lambs. The center is one of two in the United States that can accommodate long-term ventilation of lambs with PPHN. Established for over 20 years, its purpose has remained constant: to discover new treatments for the disease. Working in conjunction with Northwestern University, the Division has received a grant to study anti-oxidants such as superoxide dismutase in the treatment of PPHN.

The Division is also the recipient of a PROP (Prematurity and Respiratory Outcomes Program) grant and a TOLSURF (Trial Of Late SURfactant) grant aimed at the prevention of Bronchopulmonary dysplasia (BPD). Recently, the Division along with the Division of Neonatology at Rochester, has joined the Neonatal Research Network established by the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD).

Impacting treatment

Comprised of a team of neonatologists led by Dr. Satyan Lakshminrusimha along with nursing and other clinical staff specializing in the critical care of newborns, it serves Buffalo and Western New York and the surrounding regions. The 64-bed NICU admits over 740 babies each year and has an average daily census of 52 babies.

Approximately one-third of admissions are transported from outlying hospitals by the active Neonatal Transport Team, led by Dr. Vivien Carrion. This team consists of neonatal nurse practitioners and specially trained neonatal respiratory therapists, who are always ready to stabilize and transport any infant in the region to Women & Children's Hospital of Buffalo.



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Dr. Satyan Lakshminrusimha

Dr. Satyan Lakshminrusimha is an Associate Professor of Pediatrics at the University at Buffalo. He received his medical degree from Mysore Medical College, University of Mysore, India.

PEDIATRIC UROLOGY:

Leading a major NIH-funded clinical trial, RIVUR

The Department of Pediatric Urology at Women & Children's Hospital of Buffalo has long been a leader, both nationally and internationally, in research of urological disorders in children, contributing to advancements in treatment aimed at improving the lives of children affected by these disorders.

As evidence of the Department's unique place among pediatric urology centers, since 2000, Dr. Saul Greenfield, Director of Pediatric Urology, has been awarded grants totaling over \$5,000,000 by the National Institutes of Health (NIH) to study pediatric urology issues. Heading the only major NIH-funded clinical trial on pediatric urology in the country, Dr. Greenfield is a principal investigator of a five-center study comparing medical and surgical treatments of vesicoureteral reflux in children. Vesicoureteral reflux causes an abnormal backward flow of urine from the bladder to the kidneys, which can lead to persistent urinary infections and renal damage. It is a relatively common condition, diagnosed in 50,000 children in the United States annually. In this article, Dr. Greenfield speaks about the work carried out by the Department of Pediatric Urology.

Q. You are leading an NIH-funded study regarding vesicoureteral reflux. Please elaborate.

A. First off, we are extremely proud of the grants we've received from the NIH and NIDDK (National Institute of Diabetes and Digestive and Kidney Diseases). It's quite unusual to have an NIH-funded pediatric urology study, even for basic research, let alone clinical research. We are the only major NIH-funded clinical trial in pediatric urology in the nation, and are one of just five clinical centers involved in the study.

The name of the study is RIVUR, which stands for Randomized Intervention for children with VesicoUreteral Reflux. I am a principal investigator for the study, which evaluates medical treatments of reflux. Vesicoureteral reflux is most often a congenital condition, and it can cause recurrent urinary tract infections and kidney damage, which may lead to hypertension and kidney failure in children and young adults.

The study is multi-faceted: an ancillary part of the RIVUR study is CUTIE, or Careful Urinary Tract Infection Evaluation. This project assesses the risk of the development of renal scarring in children who have urinary tract infections and do not have vesico-ureteral reflux or any other underlying urologic abnormalities.

Q. How were you uniquely placed to qualify for these grants?

A. Women & Children's Hospital of Buffalo has been a leader nationally and internationally in the reflux field. We have reported the largest single institution series of children with reflux, in addition to numerous other surgical, clinical, and basic science investigations in this area. This project is a continuation of our previously published work—we have been investigating and publishing in this area for the better part of 20 years—and it also reflects the national recognition that our work has received. To be awarded NIH funding, it's very helpful to have a track record, particularly in terms of publications and investigations in your field. Also, when pursuing additional funding after the initial grant, we were ranked according to our performance, and our score was very high. The NIH was very pleased with how we were conducting our research.



Q. What makes this research so timely?

A. Reflux is one of the most common problems we deal with in pediatric urology. In this study, we accept patients from one month to 71 months, but many of our patients are infants. It's a very controversial area because there are lots of arguments about what to do with medications and surgery. This project is intended to answer some of those questions.



Dr. Saul Greenfield

Dr. Greenfield has authored and co-authored over 100 scientific articles and book chapters. He has been a Visiting Professor at numerous institutions, invited lecturer at the Society of Genitourinary Reconstructive Surgeons, Program Chair at national pediatric urology meetings, current President of the Society for Pediatric Urology (SPU), past President of the American Association of Pediatric Urologists, and member of the Executive Committee of the Urology Section of the American Academy of Pediatrics. He is Director of Pediatric Urology, Women & Children's Hospital of Buffalo and Clinical Professor of Urology, University at Buffalo School of Medicine and Biomedical Sciences. Dr. Greenfield is a graduate of the University of Pennsylvania School of Medicine; he trained in Urology at Columbia-Presbyterian Medical Center and Pediatric Urology at the Children's Hospital of Buffalo.

Q. In terms of treatment, please discuss your urology program and the team in place at the hospital.

A. Another program we have initiated is called CUPID, which stands for the Center for Urinary Pediatric Incontinence Disorders. Within the center, we have an interdisciplinary team dealing with urinary incontinence disorders in children. The team consists of physicians, nurse practitioners, and a nurse specialist, who performs urodynamics testing and biofeedback therapy. With biofeedback therapy, we work with children who have abnormal voiding function, so that they learn to void normally.

We also have an on-site lab that allows us to assess the innervation of the bladder and to assess bladder function, which is particularly useful for children born with neurologic problems like spina bifida. We also use the lab to diagnose and treat otherwise healthy children who have abnormalities that affect nerve control of the bladder.

Q. The Department performs over 1,000 surgical procedures per year, encompassing all aspects of reconstructive pediatric urological surgery, from the very commonplace to the tertiary. Your facility is particularly well regarded for certain surgical procedures.

A. We have had great success with hypospadias repair (reconstruction of an incompletely formed urethra). Hypospadias occurs in one of 200 live births, and only pediatric urologists perform this type of surgery. Here in Buffalo, we have published extensively on the subject and demonstrated superior surgical outcomes. We do long-term follow-up with our patients, tracking them into young adulthood, and they have shown excellent results with minimal complications.

We are also innovators when it comes to treating patients with ambiguous genitalia or intersex patients. Women & Children's Hospital of Buffalo is one of the few hospitals employing an intersex team, which consists of urology, endocrinology, and psychology specialists who take an integrated approach to working with children born with ambiguous genitalia. Very few children's hospitals have a program like ours.

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