CHEST WALL INTERNATIONAL GROUP ANNUAL MEETING

CWIG Norfolk 2016
June 15-17

Children’s Hospital of The King’s Daughters
Norfolk, Virginia

Home of the Nuss Procedure
Dear Participant:

On behalf of Children's Hospital of The King's Daughters and the Department of Surgery of Eastern Virginia Medical School in conjunction with the Chest Wall International Group, it is our pleasure to welcome you to the 17th annual Chest Wall International Group Meeting. Since 2009, CWIG annual meetings continue to be a platform for medical professionals to share and exchange their experiences in the care and management of chest wall disorders. This meeting offers a unique opportunity for all speakers and representatives to discuss ideas and pursue new techniques. We are honored to host this gathering in Norfolk, Virginia, for the first time as a conjoint event to our annual Nuss conference.

In 1987, Dr. Donald Nuss originated the minimally-invasive repair of pectus excavatum, and since that time our team has performed more than 2,100 minimally-invasive chest wall repairs. There have been numerous modifications to the original technique that we would like to share with you. We will review the latest in excavatum treatment with the vacuum bell and discuss treatment of pectus carinatum with bracing, minimally invasive and open operation. We have over 20 guest speakers from different specialties including thoracic surgery, pediatric surgery and other specialties sharing their expertise on various topics that are valuable to the management of chest wall disorders.

We hope you enjoy your stay in Norfolk. Please feel free to ask questions of any of the surgeons as each individual brings unique knowledge and experience to performing Nuss procedures. In spite of his retirement from clinical practice, Dr. Nuss will lecture and has made himself available throughout the course to offer his vast experience to you.

Sincerely,

Robert E. Kelly, Jr., MD, FACS, FAAP
Robert J. Obermeyer, MD, FACS, FAAP
M. Ann Kuhn, MD, FACS, FAAP
Frazier W. Franz, MD, FACS
Michele L. Lombardo, MD, FACS, FAAP
Children’s Hospital of The King’s Daughters is one of the top sites in the world for pediatric chest wall reconstruction. In the late 1980s, CHKD started its care of pectus patients under the direction of Donald Nuss, pioneer of the Nuss Procedure. Over the last two and a half decades, CHKD pediatric surgeons have performed more than 2,100 chest wall reconstruction surgeries.

CHKD’s pectus program is led by Dr. Robert E. Kelly, Jr. In collaboration with his five partners, clinical staff and administrative support, the program evaluates over 300 patients annually for chest wall deformities. The team successfully performs approximately 140 chest wall reconstruction surgeries per year.

CHKD continues to be the leading center for chest wall deformities in the United States and has initiated several new treatment options. In 2008, CHKD pediatric surgeons performed their first reverse Nuss Procedure for pectus carinatum - also known as the Abramson Procedure.

In collaboration with Dr. Marcelo Martinez-Ferro from Buenos Aires, Argentina, CHKD’s pectus program initiated a minimally-invasive treatment of pectus carinatum in 2009 by using the dynamic compression brace. Treatment with the dynamic compression brace is provided during a multi-disciplinary bracing clinic by a team composed of a pediatric surgeon, a sports medicine physical therapist and clinical staff. This bracing clinic is held monthly for new applications of the brace and brace adjustments. The bracing clinic at CHKD has treated more than 320 patients with the dynamic compression brace.

In 2012, CHKD surgeon Dr. Robert J. Obermeyer collaborated with Dr. Frank-Martin Haecker of University Children’s Hospital in Basel, Switzerland, to implement the vacuum bell as a minimally-invasive treatment of pectus excavatum. CHKD has treated more than 130 patients with the vacuum bell.

In continuing to recognize the development of cutting-edge treatments for chest wall deformities, CHKD pediatric surgeons continue to collaborate with surgeons from around the world and with our local university, Old Dominion University, to refine treatment options for chest wall deformities.
Accreditation
Children’s Hospital of The King’s Daughters is accredited by the Medical Society of Virginia to provide continuing medical education for physicians.

Credit Designation
Children’s Hospital of The King’s Daughters designates this live activity for a maximum of 20 AMA PRA Category 1 Credit(s)™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Disclosure of Significant Relationships with Relevant Commercial Companies/Organizations
Children’s Hospital of The King’s Daughters endorses the Standards for Commercial Support of Continuing Medical Education of the Medical Society of Virginia and the Accreditation Council for Continuing Medical Education that the providers of continuing medical education activities and the speakers at these activities disclose significant relationships with commercial companies whose products or services are discussed in educational presentations. A commercial interest is any entity producing, marketing, re-selling or distributing health care goods or services consumed by, or used on, patients.

For providers, significant relationships include large research grants, institutional agreements for joint initiatives, substantial gifts or other relationships that benefit the institution. For speakers, significant relationships include receiving from a commercial company research grants, consultancies honoraria and travel, other benefits, or having a self-managed equity interest in a company.

Disclosures:
The following faculty and planners have disclosed that neither they nor their spouses or partners have an affiliation with any commercial interest that may or may not have an interest in the subject matter of this CME activity and/or will not discuss off-label uses of any FDA approved pharmaceutical products or medical devices.

Horacio Abramson, MD
Laura Ardigo, MD
Anthony Asmar
Chenghao Chen, MD
Jay N. Collins, MD
Davit Dallakyan, MD
Caroline Fortmann, MD
Frazier Frantz, MD
Christine Kim Garcia, MD, PhD
Natalia Alvarez Garcia, MD
Paul J. Gustin
Frank-Martin Haecker, MD
André Hebra, MD
Kevin Johnson, MD
Yasushi Kasagi, MD, PhD
Sunghoon Kim, MD
M. Ann Kuhner, MD
Michael P. LaQuaglia, MD
Cosimo Lequaglie, MD
Michele Lombardo, MD
Rick McKenzie, PhD
Mohammad F. Obeid
Murat Oncel
Hyung Joo Park, MD
James Paulson, PhD
David Perez, MD, PhD
Rajan Santosham

Horacio Abramson, MD
Laura Ardigo, MD
Anthony Asmar
Chenghao Chen, MD
Jay N. Collins, MD
Davit Dallakyan, MD
Caroline Fortmann, MD
Frazier Frantz, MD
Christine Kim Garcia, MD, PhD
Natalia Alvarez Garcia, MD
Paul J. Gustin
Frank-Martin Haecker, MD
André Hebra, MD
Kevin Johnson, MD
Yasushi Kasagi, MD, PhD
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Murat Oncel
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David Perez, MD, PhD
Rajan Santosham

The following faculty/planners have disclosed that they have an affiliation with a commercial interest that may or may not have an interest in the subject matter of this CME activity and/or will discuss off-label uses of any FDA approved pharmaceutical products or medical devices. Speakers have agreed to support their clinical recommendations with the best evidence available from all sources and not make any clinical recommendations regarding products or services. Planners listed below have attested that, to the best of their ability, their financial relationship with commercial interests will not affect any speakers or content over which they exerted control and/or agreed to recuse themselves from planning activity content in which they have a conflict of interest.

Jose Ribas Milanez de Campos, MD:
Salvape -consultant, Synthes -consultant

Davi De Podesta Haje, MD, PhD:
Ortholuz (Brazil) -holder of intellectual property rights
LOC (England) -royalty

Dawn Jaroszewski, MD:
Zimmer Biomet -consultant

Robert E. Kelly, Jr., MD:
Zimmer Biomet -grant/research support, consultant for product review, development and education

Marcelo Martinez-Ferro, MD:
Pampamed SRL -owner, FMF Dynamic Compressor System -patent holder

Donald Nuss, MB, ChB:
Zimmer Biomet -consultant, royalty

Robert Obermeyer, MD:
Zimmer Biomet -consultant for product review and development

Hans K. Pilegaard, MD:
Zimmer Biomet -consultant

Manuel Lopez MD, PhD:
Orten -developing

The CME committee members have disclosed that neither they nor their spouses or partners have an affiliation with any commercial interest that may or may not have an interest in the subject matter of this CME activity.
Robert E. Kelly, Jr., MD, FACS, FAAP, is a board-certified pediatric and general surgeon. He received his medical degree from Johns Hopkins University in 1985. He completed his general surgery residency at Vanderbilt University School of Medicine and his pediatric surgery fellowship at Children’s Hospital of Buffalo. Dr. Kelly has also completed ECMO and surgical research fellowships at UCLA School of Medicine.

Dr. Kelly joined Children’s Surgical Specialty Group in the department of pediatric surgery at CHKD in 1994 with special interests in chest wall deformities, inguinal hernias and newborn anomalies. Dr. Kelly has introduced new surgical techniques along with Dr. Donald Nuss, developer of the Nuss Procedure. Since his arrival at CHKD, Dr. Kelly has pioneered many well-regarded research collaborations, including ongoing work with Old Dominion University’s engineering department to develop a simulator for teaching surgeons the Nuss Procedure. Dr. Kelly is a contributing investigator on an IRB-approved study, led by fellow surgeon Dr. Michelle Lombardo, assessing body image on pectus carinatum patients in collaboration with Dr. James Paulson of the Old Dominion University psychology department. In 2014, Dr. Kelly received the title of adjunct professor of modeling and simulation engineering with Old Dominion University’s Batten College of Engineering and Technology - Modeling, Simulation and Visualization Engineering.

Dr. Kelly has served as chair of the department of surgery at CHKD since 1998, and is currently the vice president for surgical affairs and surgeon-in-chief. He has been a member of the medical executive committee for more than 15 years. He holds the academic appointment of professor of clinical surgery and pediatrics in the department of surgery at Eastern Virginia Medical School. Since 2008, Dr. Kelly has been the program director for an intensive international pectus workshop and training course each year at CHKD.

Robert Obermeyer, MD, FACS, FAAP, is a board-certified pediatric and general surgeon. He graduated from the University of Cincinnati College of Medicine and was the former chief resident in general surgery at Western Reserve Care System. He completed fellowships in advanced laparoscopic minimally-invasive surgery at the Baylor College of Medicine and in pediatric surgery at Arkansas Children’s Hospital. He also has a degree in mechanical engineering from Ohio Northern University.

Dr. Obermeyer joined Children’s Surgical Specialty Group in the department of pediatric surgery at CHKD in 2005 with a special interest in neonatal surgery, minimally-invasive laparoscopic surgery, and chest wall deformities. He is the principal investigator on seven IRB-approved studies at Eastern Virginia Medical School. He has also worked on engineering projects involving motion analysis of the chest wall of pectus patients and has designed a surgical tool for pectus surgery in collaboration with the Old Dominion University engineering department with a U.S. patent. In 2012, Dr. Obermeyer helped to implement vacuum bell therapy as a non-invasive treatment for select pectus excavatum patients at CHKD.

Dr. Obermeyer is currently an assistant professor of clinical surgery and pediatrics at Eastern Virginia Medical School. He is a member of the American Pediatric Surgical Association, Society of American Gastrointestinal and Endoscopic Surgeons, International Pediatric Endosurgery Group, and a fellow of both the American Academy of Pediatrics and the American College of Surgeons.

Frazier W. Frantz, MD, FACS, is a board-certified pediatric and general surgeon. He received his medical degree from Duke University School of Medicine. He completed his general surgery residency at the Medical College of Virginia in Richmond and a pediatric general surgery fellowship at Cincinnati Children’s Hospital. After completing fellowship training, Dr. Frantz served as the division head of pediatric surgery at the Naval Medical Center in Portsmouth, Virginia, until his retirement from the Navy. While there, he developed the largest minimally-invasive pectus repair practice in the military, treating both dependent and active-duty military patients from around the world with the Nuss Procedure.

Dr. Frantz joined Children’s Surgical Specialty Group in the department of pediatric surgery at CHKD in 2009 with special interests in chest wall deformities, pediatric solid tumors, vascular anomalies and colorectal diseases in childhood. His current research projects include optimization of post-operative pain management after pectus repair with incorporation of regional anesthetic techniques using para-vertebral catheters for local anesthetic infusion. He has innovated techniques of open repair in patients with asymmetric and complex chest wall deformities with utilization of titanium plating for stabilization and alignment of bony rib-to-sternal gaps during costal cartilage re-growth. In 2015, he collaborated with Biomet in developing a custom titanium implant for a patient with a “floating” sternum and flail chest which had resulted from previous failed attempts at pectus excavatum repair.

Dr. Frantz was named medical director and chief of pediatric surgery at CHKD in November 2014. He also serves as the surgical co-director of the neonatal intensive care unit. He is an assistant professor of clinical surgery and pediatrics at Eastern Virginia Medical School.
Ann Kuhn, MD, FACS, FAAP, is a board-certified pediatric and general surgeon. She graduated from Marshall University School of Medicine in West Virginia. She completed her general surgery residency at Ohio State University and her fellowship in pediatric surgery at Oklahoma University. In addition, she has completed a trauma/research fellowship at Nationwide Children's Hospital in Columbus, Ohio, and a wound healing research fellowship at the Institute for Tissue Regeneration, Repair and Rehabilitation at the Bay Pines Veterans Affairs Medical Center in Florida.

Dr. Kuhn joined Children's Surgical Specialty Group in the department of pediatric surgery at CHKD in 2005 with special interests in trauma and burns. Currently she is responsible for developing a program for CHKD to become a state designated pediatric trauma center. She is also responsible for pioneering research developments and collaborations for the trauma program as part of this process. Dr. Kuhn has helped develop vascular access infection plans that have made a monumental contribution to the vascular access team at CHKD.

Dr. Kuhn is currently assistant professor of clinical surgery and pediatrics in the department of surgery at Eastern Virginia Medical School. She is currently the medical director of trauma services and medical director of vascular access at CHKD.

Michele L. Lombardo, MD, FACS, FAAP, is a board-certified pediatric and general surgeon. She graduated from Boston University School of Medicine. Prior to medical school, she was involved in angiogenesis research at Harvard University, was a houseparent in a family-model group home for at-risk youth, and worked for the Massachusetts Teratogen Information Service and National Birth Defects Center. She completed her general surgery residency at Brown University and Rhode Island Hospital and her fellowship in pediatric surgery at Brown University and Hasbro Children's Hospital.

Dr. Lombardo joined Children's Surgical Specialty Group in the department of pediatric surgery at CHKD in 2011 with special interests in surgical education and training. She is CHKD's surgeon champion for the National Surgical Quality Improvement Project (NSQIP). Dr. Lombardo’s research interest is in body image in pectus disorders. Dr. Lombardo is the principal investigator on an IRB-approved study at Eastern Virginia Medical School assessing body image on pectus carinatum patients in collaboration with Dr. James Paulson of the Old Dominion University psychology department.

Dr. Lombardo is currently an assistant professor of clinical surgery and pediatrics at Eastern Virginia Medical School. She is a member of the American Pediatric Surgical Association, American College of Surgeons and Tidewater Pediatric Society.

Donald Nuss, MB, ChB, FACS, FAAP, FRCS(C), received his medical degree from the University of Cape Town, South Africa, in 1963. Dr. Nuss completed his general surgery residency at the Mayo Graduate School of Medicine and Mayo Clinic in 1971 and his fellowship in pediatric surgery at Red Cross War Memorial Children's Hospital in Cape Town in 1973. Dr. Nuss served as the director of CHKD’s division of pediatric surgery and professor of surgery and pediatrics at Eastern Virginia Medical School in Norfolk, Virginia, and was a member of the board of directors of CHKD Health System, Inc., for nine years.

Dr. Nuss served on the medical executive committee of CHKD for 25 years and as surgeon-in-chief and vice president for surgical affairs for 20 years. He helped facilitate the development of the operating rooms at CHKD and saw the volume of surgical patients grow from 2,200 patients to more than 11,000 patients per year during his tenure as surgeon-in-chief.

Dr. Nuss is the developer of the minimally-invasive procedure for pectus excavatum and conducts an intensive international workshop and training course each year at CHKD. He was instrumental in establishing prospective research studies on chest wall deformities including long term outcomes as long ago as the early 1990s. Dr. Nuss is emeritus professor of surgery at Eastern Virginia Medical School.
Wednesday, June 15

7:00 A.M.  Registration/continental breakfast
8:00 A.M.  Pre-test (to be completed via SurveyMonkey prior to conference)
8:05 A.M.  Welcome - Dr. Robert Kelly, Jr. (Norfolk, VA, US), Dr. L.D. Britt (Norfolk, VA, US)
8:10 A.M.  Keynote address: Chest wall deformity - Dr. Donald Nuss (Norfolk, VA, US)
9:00 A.M.  Innovation and chest wall problems (including video) - Dr. Hyung Joo Park (Seoul, South Korea)
9:45 A.M.  Break ~ coffee/juice bar available
10:00 A.M. Adult pectus excavatum (including video) - Dr. Dawn Jaroszewski (Phoenix, AZ, US)
10:45 A.M. Pectus excavatum in younger patients in Beijing Children’s Hospital (including video) - Dr. Cheng-hao Chen (Beijing, China)
11:30 A.M. Chest wall reconstruction after tumor resection - Dr. Michael LaQuaglia (New York, NY, US)
12:15 P.M. Lunch - Dr. Sadashige Uemura (Okayama, Japan)
1:15 P.M. Virtual reality and chest wall problems - Dr. Rick McKenzie (Norfolk, VA, US)
1:45 P.M. Cardiopulmonary effects of pectus deformities (including video) - Dr. Hans Pilegaard (Aarhus, Denmark)
2:30 P.M. Break ~ coffee/tea bar available
2:45 P.M. The right ventricle - Dr. Alexander Levitov (Norfolk, VA, US)
3:15 P.M. Genetics of chest wall abnormalities - Dr. Christine Garcia (Dallas, TX, US)
3:45 P.M. Pectus surgery outcomes: Avoiding complications - Dr. Andre Hebra (Charleston, SC, US)
4:15 P.M. Re-do surgery by submuscular MIRPE for re-depression after the surgical treatment of pectus excavatum (including video) - Dr. Yasushi Kasagi (Ehime, Japan)
4:23 P.M. Questions & Answers, afternoon session - Dr. Robert Kelly, Jr. / Dr. Donald Nuss
6:30 P.M. CHKD Welcome Reception
(Transportation will be provided from the host hotel to the CHKD Welcome Reception)

Ancillary Meetings - Wednesday, June 15:

4:30 - 6:30 P.M. CWIG executive committee meeting* Frank-Shangri -Yorktown Room

*Agenda will be sent to committee members
<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>7:00</td>
<td>Continental breakfast</td>
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<tr>
<td>8:00</td>
<td>Surgical approach to unusual chest wall deformities (including video)</td>
<td>Dr. Patricio Varela (Santiago, Chile)</td>
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<td>8:45</td>
<td>Results at our center over the last 10 years</td>
<td>Dr. Robert Kelly, Jr. (Norfolk, VA, US)</td>
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<tr>
<td>9:15</td>
<td>Body image and chest wall deformity (including video)</td>
<td>Dr. Michele Lombardo, Dr. James Paulson (Norfolk, VA, US)</td>
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<tr>
<td>9:45</td>
<td>Break ~ coffee/tea bar available</td>
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<tr>
<td>10:00</td>
<td>Risk factors and treatment of pectus bar infections</td>
<td>Dr. Robert Obermeyer (Norfolk, VA, US)</td>
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<tr>
<td>10:30</td>
<td>Adult chest wall resection for tumor (including video)</td>
<td>Dr. Cosimo Lequaglie (Vulture, Italy)</td>
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<td>11:15</td>
<td>Questions &amp; Answers, morning session</td>
<td>Dr. Robert Kelly, Jr. (Norfolk, VA, US)</td>
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<td>11:30</td>
<td>Group photo session</td>
<td>Location TBA</td>
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<tr>
<td>11:45</td>
<td>Lunch</td>
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<tr>
<td>12:45</td>
<td>Brace treatment of chest wall deformity/Scoliosis and chest wall programs (including video)</td>
<td>Dr. Murat Oncel (Konya, Turkey)</td>
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<td>1:30</td>
<td>Abramson/reverse Nuss operation for carinatum (including video)</td>
<td>Dr. Mustafa Yuksel (Istanbul, Turkey)</td>
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<td>2:15</td>
<td>Comments/Questions &amp; Answers</td>
<td>Dr. Horacio Abramson (Buenos Aires, Argentina)</td>
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<tr>
<td>2:20</td>
<td>Break ~ coffee/tea bar available</td>
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<tr>
<td>2:35</td>
<td>Imaging/treatment of chest wall deformity</td>
<td>Dr. Marcelo Martinez-Ferro (Buenos Aires, Argentina)</td>
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<td>3:15</td>
<td>New methods of imaging</td>
<td>Dr. Manuel Lopez (St. Etienne, France)</td>
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<tr>
<td>3:50</td>
<td>Questions &amp; Answers, afternoon session</td>
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<tr>
<td>4:15</td>
<td>Conclusion</td>
<td></td>
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<tr>
<td>7:00</td>
<td>CWIG Gala Dinner</td>
<td>Half Moone Cruise and Celebration Center</td>
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<td>(Transportation from the host hotel to the Gala Dinner will be provided)</td>
<td>Dr. Robert Kelly, Jr. (Norfolk, VA, US)</td>
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<tr>
<td>Time</td>
<td>Event</td>
<td>Speaker and Location</td>
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<tr>
<td>7:00 A.M.</td>
<td>Continental breakfast</td>
<td>- Dr. Robert Kelly, Jr. (Norfolk, VA, US)</td>
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<tr>
<td>7:30 A.M.</td>
<td>Introduction to videos</td>
<td>- Dr. Robert Kelly, Jr. (Norfolk, VA, US)</td>
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<tr>
<td>7:45 A.M.</td>
<td>Zip to rib sternal pull-back: New approach for pectus carinatum</td>
<td>- Dr. Marcelo Martinez-Ferro (Buenos Aires, Argentina) presented by Dr. Laura Ardigo</td>
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<tr>
<td>8:00 A.M.</td>
<td>Minimally-invasive repair pectus carinatum</td>
<td>- Dr. David Perez (Las Palmas, Spain)</td>
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<tr>
<td>8:15 A.M.</td>
<td>Open repair of pectus arcuatrium (modified Ravitch repair)</td>
<td>- Dr. Jose Ribas Milanez De Campos (São Paulo, Brazil)</td>
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<td>8:30 A.M.</td>
<td>Nuss Procedure female patient</td>
<td>- Dr. M. Ann Kuhn (Norfolk, VA, US)</td>
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<tr>
<td>9:00 A.M.</td>
<td>Concurrent open heart surgery and repair of pectus excavatum</td>
<td>- Dr. Hyung Joo Park (Seoul, South Korea)</td>
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<td>9:15 A.M.</td>
<td>Acquired Jeune's syndrome</td>
<td>- Dr. Horacio Abramson (Buenos Aires, Argentina)</td>
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<tr>
<td>9:30 A.M.</td>
<td>Techniques of sternal elevation</td>
<td>- Dr. Frank-Martin Haecker (Basel, Switzerland)</td>
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<tr>
<td>9:45 A.M.</td>
<td>Safety-string (SAFE-ST): A handy maneuver for Nuss bar removal</td>
<td>- Dr. Marcelo Martinez-Ferro (Buenos Aires, Argentina) presented by Dr. Laura Ardigo</td>
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<tr>
<td>10:00 A.M.</td>
<td>Break ~ coffee/ juice bar available</td>
<td>- Dr. Frazier Frantz (Norfolk, VA, US)</td>
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<td>10:15 A.M.</td>
<td>Custom titanium implant: Innovation through compassion</td>
<td>- Dr. Frazier Frantz (Norfolk, VA, US)</td>
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<tr>
<td>10:45 A.M.</td>
<td>Rib fractures stabilization and chest wall reconstruction: Is there any benefit?</td>
<td>- Dr. Jay Collins (Norfolk, VA, US)</td>
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<tr>
<td>11:15 A.M.</td>
<td>Thoracoplasty: Our experience</td>
<td>- Dr. Rajan Santosham (Chennai, India)</td>
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<tr>
<td>11:45 A.M.</td>
<td>Question &amp; Answer session</td>
<td>- Dr. Rajan Santosham (Chennai, India)</td>
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<tr>
<td>12:00 P.M.</td>
<td>Lunch</td>
<td>- Dr. Olajire Idowu (Oakland, CA, US)</td>
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<tr>
<td>1:00 P.M.</td>
<td>Submitted abstracts (10 minutes each)</td>
<td>- Dr. Olajire Idowu (Oakland, CA, US)</td>
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<tr>
<td>3:15 P.M.</td>
<td>Break ~ coffee/ tea bar available</td>
<td>- Dr. Hans Pilegaard (Aarhus, Denmark), Dr. Hyung Joo Park (Seoul, Korea)</td>
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<tr>
<td>3:30 P.M.</td>
<td>Difficult case presentation</td>
<td>- Dr. Hans Pilegaard (Aarhus, Denmark), Dr. Hyung Joo Park (Seoul, Korea)</td>
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<tr>
<td>4:00 P.M.</td>
<td>Conclusion</td>
<td>- Dr. Hans Pilegaard (Aarhus, Denmark), Dr. Hyung Joo Park (Seoul, Korea)</td>
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<tr>
<td>5:45 P.M.</td>
<td>Transportation bus leaves from host hotel for Minor League Baseball - Triple A game at Harbor Park</td>
<td>- Dr. Hans Pilegaard (Aarhus, Denmark), Dr. Hyung Joo Park (Seoul, Korea)</td>
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<tr>
<td>6:00 P.M.</td>
<td>Dinner served at Harbor Park before game</td>
<td>- Dr. Hans Pilegaard (Aarhus, Denmark), Dr. Hyung Joo Park (Seoul, Korea)</td>
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<tr>
<td>7:05 P.M.</td>
<td>Game begins - Norfolk Tides vs. Durham Bulls</td>
<td>- Dr. Hans Pilegaard (Aarhus, Denmark), Dr. Hyung Joo Park (Seoul, Korea)</td>
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**Ancillary Meetings - Friday, June 17:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
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<tbody>
<tr>
<td>4:15 P.M.</td>
<td>CWIG business meeting*</td>
<td>Frank-Shangri - Yorktown Room</td>
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</table>

*Open to CWIG members and attendees interested in becoming members
Poster sessions are divided into three concurrent sessions held during lunch each day. Each presentation will be 5-6 minutes total. Each moderator will plan to make one observation to the group and ask one question to the presenter.

Wednesday, June 15, 2016, 12:15 - 1:15 P.M.
Moderator: Dr. Sadashige Uemura (Okayama, Japan)
Presentation of Posters 1-6

1. Dynamic compression therapy with FMF® device improves thoracic elasticity in patients with pectus carinatum - Gaston Federico Bellia Munzon, Maria Laura Ardigo, Marcelo Martinez-Ferro
2. Heavy metal intoxication after minimally-invasive repair of pectus excavatum - Sophia Fortman
4. Association of braces and exercises to vacuum bell for the treatment of pectus excavatum - Davi Haje
5. Uni-portal Nuss Procedure: Where do we place the camera? - Ivan Schewitz
6. 724 cases with the submuscular Nuss Procedure; safe & secure - Yashushi Kasagi, Machiko Saito, Akihiro Matsuoka, Hideo Teraoka

Thursday, June 16, 2016, 11:45 A.M. - 12:45 P.M.
Moderator: Dr. Murat Oncel (Konya, Turkey)
Presentation of Posters 7-12

7. Stiffness and the ultrastructure of costal cartilage - Michael W. Stacey
8. Monitoring the effectiveness of the vacuum bell during pectus excavatum treatment: Technical innovation - S.B. Sesia, Frank Martin Haecker
9. Use of a new 3D imaging technology in the evaluation of pectus deformities - Kevin N. Johnson, James Geiger
11. Computed 3D tomographic analysis of the Nuss Procedure using pre- and postoperative utility - Murat Oncel, Guven Sadi Sunam, Seda Ozbek, Huseyin Yildiran

Friday, June 17, 2016, 12:00 - 1:00 P.M.
Moderator: Dr. Olajire Idowu (Oakland, California)
Presentation of Posters 13-17

13. The cross-bar technique: A method to hit the bull’s eye - Hyung Joo Park, Kyung Soo Kim
14. 20 years of single institutional experience with Ravitch procedure for pectus carinatum - Silke Van Genechten, Willy Coosemans, Hans Van Veer
15. Quality of life of children who have undergone the Nuss Procedure for pectus excavatum by their mothers - Mihoko Nakann, Tomoko Nanba, Kazuma Kawasaki, Kiyoka Inoue, Sadashige Uemura
16. 10 years of experience in the correction of pectus excavatum and carinatum in Pasto, Colombia - Ricardo Zarama, Carlos Villamil, Guerliz Chavez, Magda Reyes - to be presented by Alberto Marquez
17. Postoperative complications after minimally-invasive repair of pectus excavatum - Murat Oncel, Huseyin Yildiran
Each presentation will be an 8-minutes with an additional 2 minutes allowed for questions from the floor.

Friday, June 17, 1:00 -3:15 P.M.
Abstracts 1-13

Moderators: Dr. Manuel Lopez (St. Etienne, France) and Dr. Michele Lombardo (Norfolk, VA, US):

1:00 -1:10 p.m. Minimally-invasive repair of pectus excavatum Marmara experience - Mustafa Yüksel, Nezih Onur Ermerak, Çağatay Çetinkaya, Bihter Sayan, Tunç Laçin
1:10 -1:20 p.m. Does aggressive respiratory rehabilitation from early post-operative period after primary Nuss Procedure improve pulmonary function for the PEX patients? - Masahiko Noguchi
1:20 -1:30 p.m. Treatment of 452 patients with pectus excavatum by modified Nuss technique - A. Razumovsky, A. Alkhasov, Z. Mitupov, D. Dallakyan, M. Savelyeva.
1:30 -1:40 p.m. Quality of life and self-esteem after Ravitch procedure for pectus carinatum: Comparison with a national population sample - Silke Van Genechten, Willy Coosemans, Hans Van Veer
1:40 -1:50 p.m. One-stage operation for pectus excavatum concomitant congenital cystic lung lesion - Hui Wang, Feng-hua Wang, Jian-hua Liang, Juan Xiao, Wei Liu
1:50 -2:00 p.m. Sternum tomographic sagittal evaluation in pectus patients: New radiological angles and index, and subjective analysis of sternal patterns - Davi Haje, Kelsen Texixeira, Moacir Neto, Paulo Mendlovitz, Paulo Dolabela

Moderators: Dr. Jose Ribas Milanez De Campos (São Paulo, Brazil) and Dr. Duncan Phillips (Raleigh, NC, US):

2:00 -2:10 p.m. Sternal lifting force is reduced after using crane technique during the Nuss Procedure - Sadashige Uemura, Atsushi Yoshida, Mayumi Yamamoto, Hisako Kuyama
2:10 -2:20 p.m. Effects of Nuss Procedure on respiratory muscle strength - Murat Oncel, Huseyin Yildiran
2:20 -2:30 p.m. 3-D printing of custom-fit pectus bars via CT scan-tailored designing: A preliminary study - Kyung Soo Kim, Hyung Joo Park, Hyo Chan Ahn
2:30 -2:40 p.m. Use of transthoracic cryoanalgesia during a Nuss Procedure - Sungsoon Kim
2:40 -2:50 p.m. Close examination of the bar removal procedure (BRP): The surgeon's voice - Natalia Alvarez Garcia, Laura Ardigo, Marcelo Martinez-Ferro
2:50 -3:00 p.m. Modified Nuss Procedure for pectus excavatum repair after prior sternotomy and cardiac repair: A review of the Chest Wall International Group’s experience - Paul Gustin, Frank Martin Haecker, Hans Pilegaard, Hyung Joo Park, Dawn Jaroszewski
3:00 -3:10 p.m. Minimally-invasive repair of pectus carinatum: A single surgeon’s experience of 16 cases - Geundong Lee
**Invited Lecturers**

**Andre Hebra, MD, FACS, FAAP**, received his medical degree from the Medical University of South Carolina (MUSC) where he also completed his training in general surgery. He trained in pediatric surgery at Children's Hospital of Philadelphia. Dr. Hebra has collaborated with Dr. Nuss and Dr. Kelly on outcomes research related to pectus surgery. He is the chief of surgery of the MUSC Children's Hospital.

**Davi Haje, MD, PhD**, received his medical degree from University of Brasilia, Brazil, and completed his orthopedic residency at Hospital de Base do Distrito Federal, Brasilia. His pediatric orthopedics and disorders of the foot fellowship was completed at Hospital das Clínicas da Faculdade de Medicina de Ribeirão Preto da Universidade de São Paulo (USP), where he also concluded his doctorate in orthopedics (PhD). Since 2005, he is medical staff member of the Centro Clínico ORTHOPECTUS (Clinical Center ORTHOPECTUS) and of the Hospital de Base do Distrito Federal in Brasilia, DF, Brazil, where he is a residence instructor on pediatric orthopedics, foot disorders and chest/spine deformities. His research interests include skeletal growth disturbances, pectus deformities, spinal and limb anomalies, biomaterials (bovine bone screws), and disorders of the foot and ankle. Dr. Davi Haje, and especially his father Dr Sydney Haje, received international attention for pectus non-surgical treatment methods (braces and exercises) and other research in this field.

**Horacio Abramson, MD**, studied medicine in the Buenos Aires University (UBA), where he graduated in 1973 as Doctor in Medicine. He started his career in 1979 as thoracic surgeon at Antonio Cetrángolo Thoracic Institute where he has served as chief of thoracic surgery services since 1997. He is also an associate director of thoracic surgery at Buenos Aires University and member of the Argentina Society of Thoracic Surgery and the Argentina Respiratory Medicine Society. Since 1990, he has specialized in chest wall malformations. In 2000, he began utilizing the minimally-invasive technique developed by Dr. Nuss to resolve pectus excavatum disease. In 2002 he developed an apparatus and a particular technique for minimally-invasive pectus carinatum repair. His medicine studies include training experiences in Children Hospital of The King's Daughters, Norfolk, VA (D. Nuss, MD); Babies & Children Hospital of NY (C.J.H. Stolar, MD; S. Stylianos, MD); and Children’s Hospital, Boston (R. Schamberger, MD).

**Hyung Joo Park, MD, PhD, FCCP**, received his medical degree from Korea University, Seoul, Korea, and completed his cardiothoracic surgical training at Korea University Medical Center. He spent one year in an overseas clinical fellowship at Indiana University Medical Center and Riley Children’s Hospital in Indianapolis, Indiana, USA. His clinical and research interests are congenital cardiac surgery, heart valve repair, aortic surgery, and minimally-invasive lung surgery. Particularly, he started minimally-invasive pectus deformity repair in 1999, and now solely dedicates himself to pectus surgery. Dr. Park is professor and chief of the department of thoracic and cardiovascular surgery at Seoul St. Mary's Hospital, the Catholic University of Korea. He serves as the vice president of CWIG.

**Chenghao Chen, MD**, is a pediatric thoracic surgeon. He received his medical degree from Beijing Capital Medical University in China and completed surgical residency and fellowship at Beijing Children's Hospital. Dr. Chen has special interests in chest wall deformity and VATS, especially the minimally-invasive surgical technique for correction of pectus excavatum and carinatum. Dr. Chen is the member of Prof. Zeng's surgical team.

**Frank-Martin Haecker, MD, FEAPU**, is currently professor of pediatric surgery and co-head of the department of pediatric surgery at the University Children's Hospital Basel (UKBB), Switzerland. He attended the University of Bochum (RUB) and the University of Tuebingen, Germany, where he received his medical degree in 1990. He served as a junior staff member in the department of pediatric surgery at the University Hospital of Tuebingen and in the department of general surgery at the Hospital of Baden-Baden (Germany). He then became attending surgeon in the department of pediatric surgery at the UKBB in Basel (Switzerland) from 2000-2007. In 2008, he became an assistant professor of pediatric surgery at the University of Basel. Since 2014 he is a professor of pediatric surgery. He is now a senior staff member in the department of pediatric surgery at the UKBB. Professor Haecker is particularly interested in conservative and surgical treatment of chest wall deformities as well as in pediatric urology. He serves as the head of both the pectus program and the department of pediatric urology at the UKBB. In 2001, he became senior consultant at the department of pediatric surgery at the University Hospital of Freiburg (Germany). Professor Haecker is a member of several national and international professional societies. He is member of the executive committee of CWIG (Chest Wall International Group).

**Michael P. La Quaglia, MD, FACS, FRCS**, is the chief of the pediatric surgical service at Memorial Sloan Kettering Cancer Center and a professor of surgery at Weill Cornell Medical College in New York. He specializes in the treatment of cancer in children and adolescents, with a particular interest in neuroblastoma, gastrointestinal stromal tumor, Wilms’ tumor, hepatocellular carcinoma and other pediatric liver tumors, as well as thyroid tumors, desmoplastic small round cell tumor, and childhood sarcomas. Dr. La Quaglia is actively involved in surgical and translational oncologic research into the pathologic and genetic mechanisms of the diseases affecting his patients and has participated in the research of the Gastrointestinal Stromal Tumor Clinic of the National Institutes of Health. As a member of the faculty of both Memorial Sloan Kettering Cancer Center and Weill Cornell Medical College, he has been a committed medical educator for decades, training scores of pediatric surgeons who now practice across the US and internationally.

Dr. La Quaglia earned his MD degree from the University of Medicine and Dentistry of New Jersey in 1976 and completed his postgraduate training at Massachusetts General Hospital and Children’s Hospital Medical Center in Boston, Massachusetts, and at Broadgreen Regional Chest Center in Liverpool, England. He is a fellow of the American College of Surgeons and the Royal College of Surgeons in Edinburgh and has served for several years as the surgical committee chairperson of the Children’s Oncology Group. He also holds additional leadership positions in several professional societies, including the American Pediatric Surgical Association and the American Academy of Pediatrics. Dr. La Quaglia has authored over 200 articles in peer-reviewed journals and has contributed chapters to numerous medical textbooks.

**Manuel Lopez, MD, PhD, HDRP**, specializes in pediatric surgery and urology at the University Hospital of Saint Etienne, France. He completed a pediatric surgical residency at Garrahan Hospital in Buenos Aires-Argentina and a MIS fellowship in pediatric surgery and urology in France. His focus is in the areas of minimally-invasive surgery in general pediatrics, urology and chest wall deformities.
Dawn E. Jaroszewski, MD, MBA, FACS, is an associate professor of surgery and cardiothoracic surgeon at the University of California Los Angeles. She returned to Mayo Clinic Arizona in 2006 and serves as a senior consultant and associate professor in the division of cardiothoracic surgery.

Double-boarded in cardiothoracic and general surgery, Dr. Jaroszewski specializes in pectus and chest wall deformities. As director of the Mayo Clinic chest wall program, the center has become one of the largest volume adult pectus treatment sites in North America. She has been involved in over 100 research projects and publications of peer-reviewed journal articles, abstracts and book chapters.

Professor Patricio Varela, MD, is a pediatric surgeon from Santiago de Chile. He received his medical degree from the University of Chile in 1990 and completed his surgical residency at Calvo Mackenna Children’s Hospital in Santiago, Chile. His pediatric surgery fellowship was completed at Le Bonheur Children’s Medical Center in Memphis, Tennessee, in 1998.

Dr. Varela has received international attention for his expertise in chest wall malformations and tracheal surgery in children. He was one of the pioneers in introducing the Nuss Procedure in Central and South America since 1999. Dr. Varela is past president of the Chilean Pediatric Surgical Society and past president of the South American Pediatric Surgical Association. Currently, he is a director of endosurgery post graduate training, department of pediatric surgery, University of Chile, and director of the chest wall malformation and tracheal surgery unit at Calvo Mackenna Children’s Hospital.

Jay N Collins, MD, FACS received his medical degree from the University of California, Irvine, and completed his surgical residency at the University of South Alabama Medical Center. After his training, he joined the United States Navy at Naval Medical Center Portsmouth and served on the USS America. During that time he completed a trauma/surgical critical care fellowship at EVMS. He joined the faculty at EVMS in 2002 and is now chief of surgery at Sentara Norfolk General Hospital and medical director of the burn/trauma center.

Prof. Cosimo Lequaglie, MD, is currently chief of thoracic surgery department of I.R.C.C.S.-C.R.O.B., Rionero in Vulture Cancer Institute, Southern Italy. He was a consultant surgeon in the department of thoracic surgery, Milano Cancer Institute, until 2004. He is a professor of human anatomy, University of Milano, Italy, and professor of thoracic surgery, Universities of L’Aquila in Messina, Italy. Prof. Lequaglie obtained his medical degree and national board from the La Sapienza University of Roma, Italy, in 1982. He was governor of the ACCP and board member of the Italian Society of Thoracic Surgeons and of the Endoscopic Thoracic Italian Society. He is fellow and member of 15 societies.

Chest wall surgery for cancer for demolition and for repair is one of the most familiar fields to Prof. Lequaglie. He has had the opportunity to give his skill in the humanitarian missions of Doctors Without Borders in trauma and war. He has published more than 100 papers and is reviewer for 10 international journals. He has given more than 350 international-invited presentations. Prof. Lequaglie is working with Dr. Gabriella Giudice, MD, deputy director, his wife of 20 years.

Hans K. Pilegaard, MD, graduated from the Medical School Odense University in 1977. He completed general surgical training in 1989 and thoracic surgical specialization in 1992. He was appointed as a consultant in thoracic and cardiac surgery at Aarhus University Hospital, Skejby, Denmark, in 1993 and has been an associate professor at the University of Aarhus since 2000.

Dr. Pilegaard has performed more than 1,000 heart operations and more than 6,000 general thoracic operations including over 1700 corrections of pectus excavatum and 250 corrections of pectus carinatum. He is the lead for research in thoracic surgery from 2007 and has authored chapters in 10 books and contributed to more than 100 papers. He has presented internationally on various aspects of thoracic surgery, particularly pectus surgery, and has presented more than 100 oral presentations and 25 posters. Dr. Pilegaard was the chairman of the Danish Society of Thoracic Surgery between 1995-97 and chairman of the Danish Surgical Lung Cancer Group from 2002-2016. He is a member of the Chest Wall International Group (CWIG), president of CWIG 2013-2015 and faculty member of the EACTS academy.

Christine Kim Garcia, MD, PhD, received both her medical and graduate degrees from the University of Texas Southwestern Medical Center in 1996 and is currently a professor of internal medicine and member of the division of pulmonary and critical care medicine. She cares for patients seen in the UT Southwestern Advanced Lung Disease Clinic, Clements University Hospital and Parkland Memorial Hospital.

She is also a member of the McDermott Center for Human Genetics. She directs a research laboratory that focuses on defining the genetic underpinnings of lung disease. Her laboratory has discovered rare mutations in six different genes that lead to inherited forms of interstitial lung disease. These discoveries have highlighted the link between idiopathic pulmonary fibrosis (IPF), aging and telomere dysfunction. She is currently collaborating with various groups to investigate the genetics of chest wall deformities.

Mustafa Yüksel, MD, Prof., is a cardiothoracic surgeon. He was born in Ankara, Turkey, and graduated from the Ankara University Medical Faculty in 1977. He had his postdoctoral training at the Ankara Ataturk Thoracic Diseases and Thoracic Surgery Center. He worked together with Dr. Peter Goldstraw at Royal Brompton National Heart-Lung Hospital in London, UK, for one year from 1991 to 1992. He returned to Marmara University to become the head of the department. He became an associate professor in 1994 and a professor in 1999. Dr. Yüksel has written many articles and chapters in the field and has been working at Marmara University Faculty of Medicine as the head of department of thoracic surgery. Prof. Yüksel had been the former president of the Turkish Thoracic Society. He is also the founding member and the former president of the Chest Wall International Group (CWIG).
Marcelo Martinez-Ferro, MD, was born in Buenos Aires, Argentina. He graduated from the Buenos Aires University School of Medicine in 1983, completing his residency in pediatric surgery at the Ricardo Gutierrez Children’s Hospital. Later, at Garrahan National Children’s Hospital, where he stayed for 15 years, he focused on drastically improving survival of newborn surgical patients, whose mortality rate was historically very high in Argentina. In 1992, the completion of a fellowship at the fetal treatment center of the UCSF confirmed his passion and interest in fetal treatment and video surgery. Upon his return to Argentina, Dr. Ferro became a pioneer in pediatric minimal-access surgery (laparoscopy, thoracoscopy), developing techniques, tools and multidisciplinary teams to perform pediatric surgeries never done before in the country. In the early 90’s, Dr. Ferro and his team performed the first pediatric minimal-access surgery procedure in Argentina and in 2001, together with the CEMIC surgical and obstetrical team, the first fetal surgery of myelomeningocoele in South America. Many of the novel minimal-access surgical techniques and procedures used today resulted from Dr. Ferro’s innovative approaches, especially in the treatment of esophageal atresia, hepatobiliary disorders, neonatal thoracoscopic and laparoscopic procedures, and chest wall deformities. One of his most significant contributions was the invention, together with Dr. Fraile, of the FMF dynamic compressor system, an adaptable brace used to correct chest wall deformities, which is currently used worldwide with excellent results. Author of the Latin American bestseller “Neonatologia Quirurgica” (Surgical Neonatology) textbook, more than 20 other book chapters and close to 150 publications, he remains a highly-requested lecturer and guest speaker for numerous surgical and medical societies and is a former JPEG (International Pediatric Endosurgery Group) president. As current professor of surgery and pediatrics, and chief of the division of pediatric surgery, at Fundación Hospitalaria Children’s Hospital in Buenos Aires, he keeps a busy academic life and intense medical practice, fostering research, teamwork, academic excellence and career development of his staff. Always restless and in search of new trends and challenges, he is currently investigating potential clinical applications of 3D printing in pediatric surgery.

Rajan Santosham, MBBS, MS, MCH, FRCS, received his medical degree from University of Madras India and completed his surgical and thoracic surgical residency in Madras Medical College and Government General Hospital Madras. Dr. Santosham has been keenly interested in pulmonary tuberculosis and airway surgery. Dr. Santosham is the emeritus professor of thoracic surgery in the Tarninadu Dr. MGR Medical University. Prior to retirement in 2005, he was professor, head of department of cardiothoracic surgery in Madras Medical College for 11 years. After 2005, he served as honorary professor of thoracic surgery in Cancer Institute, Chennai. At present, he is in thoracic surgical practice along with his son Dr. Rajiv Santosham at Santosham Chest Hospital and Apollo Hospital Chennai.

James F. Paulson, PhD, LCP, received his doctorate in clinical child and adolescent psychology from the University of North Carolina at Greensboro. He is currently a pediatric psychologist and associate professor of psychology at Old Dominion University. His research addresses the interface between child behavior, family systems and pediatric illness and its impact on children’s interface with systems of care. He has also done extensive work focusing on early family development, with an emphasis on the role of parental psychopathology. He works with children, adolescents, and families at CHKD.

Alexander B. Levitov, MD, FCCM, FCCP, RDMS, is a professor in the division of pulmonary and critical care medicine and director of the ultrasound training program at EVMS. He is board certified in internal medicine and critical care medicine and a registered diagnostic cardiac sonographer. Recognized nationally and internationally as an expert in bedside ultrasound, he received the Presidential Citation for Outstanding Contributions from the Society of Critical Care Medicine. He is a visiting professor at Harvard Medical School, Goethe University in Frankfurt, Germany, and Yangzhou University in China. In addition, he directs several certified medical education ultrasound courses in the United States and internationally.

Frederic (Rick) D. McKenzie, PhD, is the department chair in ODU’s new modeling, simulation and visualization engineering department and a joint faculty member in the department of electrical and computer engineering. In addition, he is the director of the medical imaging, diagnosis, and analysis laboratory, adjunct associate professor at EVMS in the school of health professions, and graduate faculty scholar at University of Central Florida in the school of electrical engineering and computer science.

Dr. McKenzie’s research has been in medical modeling and simulation, human behavior representation, and simulation architectures often focusing on aspects of scientific visualization and virtual reality. For the past 10 years, he has fostered collaborative ongoing efforts with CHKD surgeons, Drs. Nuss, Kelly and Obermeyer in determining the cause of pectus excavatum and developing tools to aid in the planning and conduct of the minimally invasive Nuss Procedure, and with Thomas Hubbard, MD, of EVMS instrumenting standardized patients to improve the quality of professional skills training for medical students where Dr. McKenzie coined the term augmented standardized patient (ASP).

Dr. McKenzie received his PhD in computer engineering from the University of Central Florida in 1994. Prior to joining ODU, he held a senior scientist position at Science Applications International Corporation (SAIC), serving as principal investigator for several distributed simulation projects. At SAIC he was a team lead on a large distributed simulation system. Before joining SAIC, Dr. McKenzie worked as a student researcher on research projects involving both NASA Kennedy Space Center and NASA Marshall Space Flight Center. Both his MS and PhD work have been in artificial intelligence - focusing on knowledge representation and model-based diagnostic reasoning.

Qi Zeng MD, is a pediatric thoracic surgeon, professor of surgery, and vice president of Beijing Children’s Hospital. Dr. Zeng received his medical degree from Capital Medical University in Beijing and completed his surgical residency and fellowship at Beijing Children’s Hospital. Dr. Zeng is one of the leaders in the field of minimally-invasive procedures for chest wall deformity in China. He has completed more than 3,300 repairs on patients with pectus excavatum and 300 repairs on patients with pectus carinatum.
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We would also like to give a special thanks to the support team from the Frank Reidy Research Center for Bioelectrics at Old Dominion University, Visit Norfolk, CHKD Craniofacial Center and Operation Smile.

Medical Campus Map

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