**THE DIRECTOR’S CUT**

**Christine Donnelly, MD**

**Surgical Milestones in Pediatric Cardiology: The Birth of Open Heart Surgery—Dr. John Gibbon’s Dream and the 1st Heart-Lung Machine**

In the history of pediatric cardiac surgery, there are no two accomplishments that changed the prognosis for children with congenital heart defects more than the Blalock-Taussig (Thomas) shunt and the development of the heart-lung machine. The Blalock-Taussig shunt made life possible for children with inadequate blood flow to their lungs by creating a shunt of blood directly from an arterial vessel to the pulmonary artery. Because the operation was outside the heart (“closed”), it could be performed on a beating heart with no need to “bypass” the circulation. In this sense, the operation was “palliative”, but it did not fix the problem inside the heart. To be able to actually correct a defect inside the heart, it needed to be still and “dry” in order to visualize the problem and repair it. But to do so, the circulation needed to be supported while the operation was performed. Hence, prior to the development of the heart-lung machine, “open” heart surgery was unheard of.

One man made it his life’s work to create such a machine. In 1930, John Gibbon was a young surgical fellow under the mentorship of Dr. Edward Churchill at Mass. General Hospital when he was deeply affected by the death of his patient after removal of a massive blood clot to the pulmonary artery that had developed when she was recovering from gallbladder surgery. She had been moved to an operating room where Dr. Gibbon sat all night, monitoring her vital signs. When it became apparent there was no hope without surgical removal of the clot, she underwent a rapid removal of the clot in which he assisted Dr. Churchill in an operation that lasted only 6 minutes. Despite the short duration, the patient did not survive which was the usual outcome at that time. Dr. Gibbon subsequently wrote “if only we could remove the blood from her body by bypassing her lungs and oxygenate it, then return it to her heart, we could certainly have saved her life.” Creating a means to do this became his dream and he spent over 2 decades in meticulous research to develop a way to temporarily take over the function of the heart and lungs.

His work culminated in the 1st heart-lung machine. In 1935, he published his results about a prototype machine that was able to support the circulation of a cat while the pulmonary artery was closed off. Over the next decade, Dr. Gibbon

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**A FOND (BUT SAD) FAREWELL!**

In case you’ve heard, it’s really true that Wanda Kaminski, RN will soon be moving on to new adventures. By the end of the summer, she anticipates moving to Georgia to be near family and to continue her career in pediatric nursing.

Wanda joined the Morristown Memorial NICU staff 25 years ago and she has cared for countless children and families since then. Fifteen years ago, she was the first nurse to work in pediatric cardiology and the rest is history. We thank her for all that she’s given and wish her much happiness in the years to come!
**Summer Safety Tips by Maria Lawton, RN**

- Drink plenty of fluids, preferably electrolyte-enriched, to prevent dehydration which can lead to neurally-mediated symptoms, such as fainting, headaches, lightheadedness and fatigue.
- Wear protective sun gear, such as a broad spectrum sun screen (SPF 30), sunglasses and hats to avoid sunburn and sun-related illness.
- Avoid being outdoors during peak sun/heat hours from 10 am to 3 pm to minimize the chance of heat exhaustion or heat stroke.
- Plan to exercise in air conditioned facilities or during non-peak sun hours.
- Wear insect repellent for outdoor activities and check for ticks to prevent Lyme disease which can lead to heart block.
- Remember to pack medications and all relevant health information when going on vacation in case of an emergency.

**Healthier Heart by Suzanne Mone, MD**

**The Importance of Hydration**

Proper hydration is important for overall health. Without enough fluids, you become dehydrated which means your body does not have enough water to function normally. You lose water every day when you breathe, sweat and go to the bathroom. The water content in the foods you eat and the beverages you drink combine to hydrate your body and replenish the losses.

Hydration is essential for peak athletic performance. When you don’t consume enough liquid or fresh fruits and vegetables to stay properly hydrated, you end up thirsty and light-headed. Mild dehydration can also lead to headaches and moodiness.

Insufficient hydration fatigues your muscles, reduces your coordination and can cause muscle cramps. While working out or playing sports, dehydration compromises the body’s ability to cool itself through sweating. This can lead to heat exhaustion and in extreme cases, heat stroke which is a potentially life-threatening condition.

Exercising inside and outside, especially during hot weather, requires more water to stay properly hydrated. Your thirst mechanism alerts you that you are already becoming dehydrated. Looking at the color of your urine is one way to know how hydrated you are. Light colored or colorless urine typically indicates proper hydration. Dark yellow urine is a common indicator of dehydration.

Children with cyanotic heart disease (oxygen saturation in the 80’s or lower) need to take extra precaution with extremes of hot and cold. Adequate hydration is important to avoid increases in red blood cell mass or blood viscosity (thickness of one’s blood).

It’s best to choose water and/or electrolyte-containing beverages. Be careful to avoid those with a high sugar content and artificial coloring. The sugar content is not good for your teeth or your waistline. The sugar also increases your thirst. Avoid energy drinks as they all contain caffeine or compounds with caffeine.

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Healthy Heart (cont’d)

Feine is a diuretic and diuretics make you urinate more frequently and can lead to dehydration. Another issue regarding hydration is that many children are reluctant to use the bathrooms at school. Therefore, they don’t drink enough fluids in an effort to avoid using the bathroom. School personnel, as well as parents, need to be sensitive to this issue. Remember to take time out to drink throughout the day. Hydrate to look better, feel better and exercise better!!

The Directors Cut (cont’d)

worked to solve problems of an artificial circulation and developed a machine that could be used in larger animals. Although WWII interrupted this research work, he resumed it after the war and continued his intensive experiments resolving critical factors in the maintenance of circulation outside the body that are now taken for granted: how to drain the blood from the body, how to supply oxygen to it (lung function), how to prevent it from clotting and how to pump it back (heart function). Finally, in 1953, he was ready to apply his decades of work to help a patient. Cecelia Bavolek was an 18 year old with a large atrial septal defect, a hole in the wall between the 2 top chambers of the heart. Massive blood flow through this defect was flooding her lungs, resulting in heart failure and her 3rd hospitalization in 6 months. The only way for Cecelia to be permanently helped was to close this hole. Dr. Gibbon discussed his plan to use his heart-lung machine so he could see the hole directly, even though the machine had only been used successfully in animals at that point. Cecelia agreed to go ahead with the surgery at Jefferson Medical College Hospital in Philadelphia. On May 6, 1953, Dr. Gibbon repaired the atrial defect in Cecelia Bavolek’s heart using his heart-lung machine. For 26 minutes, his machine completely supported all of her respiratory and circulatory functions. She recovered uneventfully and 10 years later was named “Heart Queen of the Year” by the American Heart Association. Gibbon later wrote, his dream “…was born and developed into a reality and finally was employed successfully in an operation on the heart of a human patient twenty-two years later, an event that I hardly dreamed of in 1931.”

Since the first successful use of Gibbon’s heart-lung machine, which was the size of a spinet piano, many improvements and refinements have occurred and today, thousands of open-heart procedures are performed every day with use of the heart-lung machine. Thanks to the courage and perseverance of Dr. John Gibbon, May 6, 1953 ushered in a new world of possibility for children born with heart defects who would now benefit from the reality of his dream for generations to come.

Family Connection

My son, Tyler, was born in February of 2010. My husband and I had no idea until after he was born, that Tyler had a heart defect which required open-heart surgery to repair. We were sent to Columbia when he was 6 days old, and at 8 days old he had his surgery. Tyler recovered quickly, much quicker than I did anyway. For months I felt very alone. I was so upset by it and would find myself saying “Why me? Why my kid?”

As I look back over the past months, I realize I have come a very long way. Who can I attribute that to? For starters, I have a very supportive husband. Next, we go to the best Pediatric Cardiology group. I leave every appointment confident that Dr. Donnelly and her staff are giving Tyler the best care! And lastly, I have met some of the BEST people in the Parent Support Group. I was very reluctant to go at first, as I am sure many of you are. Once I convinced myself to go, I immediately felt a strong bond with people I had just met! It is a place where I feel I can talk about things regarding Tyler and know that the other parents “get it”. It is also a place where you don’t have to share, but you can feel connected just by listening to other people’s stories.

I have made life-long friends for myself, as well as for my son. I know Tyler doesn’t understand his heart defect now, but it is comforting to know that when he does, he will not feel alone either. So, if you are a parent of a young child with a heart defect, I encourage you to think about attending. I hope it will change your life, as it did mine!

Kourtney, mother of a 2 1/2 year old son

Did you know??

- There are now more adults with congenital heart defects (CHD) than children. In the United States, there are about 1 million adults and 800,000 children living with CHD.
- The number of adults with CHD increases each year by about 5%.
- In the U.S., CHD is now the most common form of heart disease encountered during a woman’s pregnancy.
- At least 10% of all congenital heart defects are first found in adulthood.
- There are more than 40 different types of congenital heart defects.
- The most common congenital heart defect is a ventricular septal defect.
- It is important for adults living with CHD to see a specialized health care provider for cardiac care regularly throughout their lives.
- It is estimated that only 50% of adults with congenital heart defects receive ongoing cardiovascular care.
- The Adult Congenital Heart Association (ACHA) is a non-profit organization dedicated to education, outreach and advocacy for adults with CHD and their families.
- What is the cost of membership in the ACHA?
**Legislative Updates**

In February 2012, the Congressional Congenital Heart Caucus was established in the U.S. House of Representatives. Caucus members function as a group around common concerns; in this case, it’s around issues relevant to congenital heart defects. The Caucus can disseminate information about CHD to other members of the House, as well as promote legislative agendas that affect people with CHD. Congressman Gus Bilirakis (R-FL) is the current chairperson and issues of concern can be directed to him. You may want to encourage your representative to join the Caucus. You can find your representative’s contact information at www.house.gov.

In June 2012, the Senate’s FY 2013 Appropriations Bill included $3 million dollars for CHD surveillance at the Centers for Disease Control and Prevention, an increase of $1 million dollars from last year. This will enable improved data collection to better understand the prevalence and the public health impact of CHD.

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**Social Work Corner**

**Margaret Micchelli, LCSW**

**5th Annual Congenital Heart Defect Awareness Walk**

**Who:** The CHD Coalition is a NJ non-profit organization whose mission is to raise awareness, fund research and provide support for those with congenital heart defects.

**What:** Fund raising walk, children’s activities, music, refreshments

**When:** Sunday, September 30, 2012 at 10 AM

**Where:** Duck Pond in Ridgewood, NJ

**Why:** Staff members of the division of pediatric cardiology will be participating and we invite you to join us for a fun and worthwhile event.

For details please contact: Kim Shadek (973) 291-4676 or www.chdcoalition.org

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**Welcome Dr. Prasad**

We are pleased to announce that Dr. Aparna Prasad will be joining the division of pediatric cardiology as another full-time physician to care for families at both Morristown Medical Center and Overlook Medical Center. She has recently completed her fellowship in pediatric cardiology at the Children’s National Medical Center in Washington, D.C. Following medical school at SUNY Buffalo, Dr. Prasad did her pediatric residency at the Children’s Hospital at Montefiore in the Bronx. Among her many skills, she also speaks Hindi and Spanish. We are very happy to welcome Dr. Prasad to our team in July.

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**Congrats to Technologists**

Well deserved congratulations to three of our cardiovascular technologists who recently received national certification in pediatric echocardiography: Kelli Vranch, Ashley DeRosa and Bhavisha Pandya. After meeting education and experience requirements, the qualifying examination involves many months of study preparation. The two 3 hour tests cover areas such as anatomy, hemodynamics, congenital & acquired pathology, instrumentation and surgical repair. We’re very proud of your accomplishment!

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**3rd Annual National CHD Awareness Day**

For the third year in a row, the division of pediatric cardiology celebrated National Congenital Cardiac Defect Awareness Day with a Valentine’s party for children and families. On February 12th, the hospital auditorium was filled with food, fun and lots of activities. Ferris the Magician performed a mesmerizing show, even pulling a live dove out of his hat. The balloon artistry of Hug-A-Me the clown was in great demand, while the therapy pets from St. Hubert’s are always a big hit. Free raffle prizes, arts and crafts, as well as a bean bag toss were all part of the festivities. It’s gratifying to see more new faces each year, building our community of “heart” families. And many thanks to the parent volunteers who were indispensable in making the afternoon a great success!

One of the most important functions of our family events is to provide an opportunity for parents and children to meet others who understand what they are experiencing. Please put this annual event on your calendar. Next year it will be on February 10, 2013.