

CUSTOMER REPORT

A matter of the heart – TOMTEC fits the needs even of pediatric cardiology

CHILDREN'S HEART CENTER AT THE AMERICAN UNIVERSITY OF BEIRUT MEDICAL CENTER



Ziad R. Bulbul, MD, Associate Professor of Pediatric Cardiology

When it comes to the heart, sharp eyes, steady hands and precise technology are imperative to diagnose, repair and treat defects of this sophisticated structure. This holds particularly true with the heart – Which in adults is on average about 12 cm long – compared to a baby whose entire body is just about 60 cm. Then, of course, the knowledge and experience of the doctor are key to success. Nevertheless: the tinier the structure, the more complicated the treatment, making the role of precision technology even more important on the road towards high quality care.

Ziad R Bulbul, MD, Associate Professor of Pediatric Cardiology at the Children's Heart Center at the American University of Beirut Medical Center, couldn't agree more. A specialist in pediatric cardiology for about 20 years, he is heading the Pediatric Non-Invasive Laboratory at the Children's Heart Center since 2015: "One of the problems we are facing in pediatric cardiology is the fact that the vast majority of IT solutions are geared towards adult heart disease. I have been struggling my entire working life with vendors to customize their software to the needs of tiny hearts. TOMTEC is the only company that I came across whose software solutions are precise enough to fulfil these needs and may be the only company that aims to adapt its basic software to pediatric cardiac anatomy. We use TOMTEC for measuring structures and function in children's hearts and consider it highly reliable," he explains.

One solution to fit all needs of a University Hospital

Ziad Bulbul is familiar with TOMTEC in cardiology because his former employer in Saudi-Arabia was in 2008 the first hospital outside Europe to purchase the system. A loyal user who is convinced of the product's value, he is now working with the system at the American University of Beirut Medical Center, using TOMTEC's complete cardiology suite – IMAGE-COM^{®1}, CARDIAC MEASUREMENTS^{®1}, 2D STRAIN ANALYSIS (2D CPA^{®1}), AutoSTRAIN^{®1}, 4D CARDIO-VIEW^{TM12}, 4D LV-ANALYSIS^{®1}, 4D RV-ANALYSIS^{®1} and 4D MV-ASSESSMENT^{®1}.

This broad range of functions and modules are necessary since the Heart Center, which is a facility of the AUBMC, not only offers diagnostics and treatment but is also heavily involved in teaching and research. For the latter, 3D analysis of the left and right ventricle is particularly important as the cardiologist explains:

INSTITUTION

- State-of-the-Art diagnostic and therapeutic techniques
- Pediatric and adult patients with congenital or acquired heart diseases
- Best quality care
- Family-friendly environment
- AUBMC offers diagnostics and treatment as well as teaching and research
- Around 250 congenital heart surgeries per year (98% success rate)
- 7000 echocardiographic examinations

“At the moment we are running two studies: In one of them we are evaluating whether the printed model of the mitral valve will enhance the training of our junior cardiologists; in the other study we are using the LV and RV printing models to create heart chambers that we can fill with blood and assess their volumes, both with TOMTEC Echo software and MRI to test the accuracy.”

“Printed Mitral valves” are also an important concept for teaching purposes. “Students and trainees in cardiology use 3D models to get a better understanding of the anatomy and pathology of the mitral valves. Here, TOMTEC is ahead of other vendors.”

Focus on the ventricles

In clinical diagnostics, TOMTEC is the “working horse” for the complete cardiac workup. It provides meaningful and tangible data: For example with regard to performing myocardial strain in children receiving chemotherapy or in children who have blood diseases such as sickle cell disease or Thalassemia; TOMTEC and its easy-to-use application makes all the difference. Chemotherapy affects the function of a child’s heart and recently LV Strain measurement has emerged as a powerful tool in the early detection of ventricular function. While strain could be measured by many ultrasound vendors TOMTEC is the only vendor-neutral product, i.e. it can be used to analyze images obtained using any Echo modality: More importantly, it can be used to analyze strain from DICOM images collected years ago, a feature that will allow us to study the progression of the disease. “The ability to read DICOM images allows us to take any examination from the archive and perform the same measurement and compare those to the current study at hand is both powerful and unique”, Dr. Bulbul underlines.

Another important issue for the team of the Children’s Heart Center is to study the cardiac manifestation of sickle cell diseases and thalassemia, which are both widespread in Lebanon and throughout the Middle East. In order to establish a pre-treatment or pre-transfusion baseline the team measures muscle performance of the right ventricle using the regular echocardiographic measurements in conjunction with TOMTEC’s strain modules. We hope that the resulting measurements might help the physician to identify early signs of heart muscle derangement prior symptoms of the emerging disease. Thus, TOMTEC can play a crucial role in helping to identify and treat children before the actual onset of the disease.

For children who were born with small heart chambers, the precise assessment of the chamber’s size and volume is crucial. By accurately measuring the ventricular volume and comparing it to reference data, TOMTEC can provide reliable data that supports the decision-making process prior to surgery and therefore offers a higher safety level for interventions. The same holds true for mitral valve surgery. Due to the ability to print a 3D model of the valve, the doctors get a better understanding of a potential repair prior to performing the intervention.

Dr. Bulbul is very pleased with the cooperation from TOMTEC, as he stresses: “I have never had any problems getting a quick response from sales, technical support or development. The TOMTEC team is very active and reliable in addressing my issues. And that is as important as the functionality of the software.”

KEY FOCUS AND MODULES IN USE

- TOMTEC offers a higher safety level for interventions due to its very accurate data that supports the decision making process prior to surgery
- Assessment of ventricular volume using RV and LV printing models

IMAGE-COM
 CARDIAC MEASUREMENTS
 2D CPA
 AutoSTRAIN
 4D CARDIO-VIEW
 4D LV-ANALYSIS
 4D RV-FUNCTION
 4D MV-ASSESSMENT

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Dr. Ziad R. Bulbul

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TOMTEC IMAGING SYSTEMS GMBH
 Edisonstrasse 6
 85716 Unterschleissheim, Germany
 o +49 89 32175 500
 e info@tomtec.de
 w www.tomtec.de