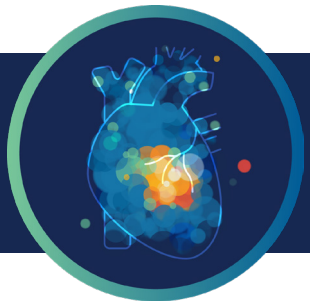
MEDPACE

Q&A WITH CARDIOVASCULAR EXPERT, DR. ADAM LUBERT



Dr. Adam Lubert is a pediatric and adult congenital cardiologist with over 10 years of experience in clinical practice, academia, and clinical research. He is board certified in internal medicine, pediatrics, pediatric cardiology, and adult congenital heart disease. Dr. Lubert has served as a pediatric and adult congenital cardiologist on faculty at Cincinnati Children's Hospital. During his time there, he directed the Fontan Management Program and led a multidisciplinary team of healthcare providers to optimize the care of children and adults who underwent the Fontan procedure. He is a key opinion leader, authoring over 40 peer-reviewed articles in the fields of pediatric and adult congenital cardiology.

Tell us a little bit about your cardiovascular background and background in clinical development.

During my time in medical school, I was introduced to the field of congenital cardiology, which immediately captured my interest. I was fascinated by the variety of physiologies and how seemingly minor variations in structural heart conditions could result in significant differences in symptoms. Although patients with congenital heart disease can undergo successful surgical or device interventions to repair or palliate their condition and improve symptoms, the medical team must prioritize both symptom relief and long-term cardiac health. This realization fueled my desire to become a cardiologist capable of caring for patients of all ages, from newborns to the elderly.

To achieve this, I completed a combined internal medicine and pediatric residency at the University of Cincinnati and Cincinnati Children's Hospital. Afterward, I trained in pediatric cardiology and adult congenital heart disease at the University of Michigan. I started my academic career as a pediatric and adult congenital cardiologist at Cincinnati Children's Hospital. My clinical expertise covers a wide range of conditions, including pediatric heart disease, congenital heart disease, valve disease, heart failure, cardiomyopathies, pulmonary hypertension, aortopathies, and arrhythmias. I love this field because it allows me to treat patients with both rare conditions, like channelopathies and complex congenital heart diseases, and common conditions, like heart failure and atrial fibrillation.

During my time working in clinical practice, I was struck by how different it is caring for patients with rare conditions versus those with more common conditions. For example, when I saw my patients with heart failure, I could make evidence-based treatment decisions based on high-quality clinical trials that enrolled thousands of patients. On the other hand, the treatment recommendations for my patients with less common conditions often relied on extrapolation from treatments for other diseases with unclear efficacy. I was fortunate to participate in clinical trials for some of these rare conditions, which sparked an interest in clinical development that I didn't know I had. So, I decided to dedicate myself to contributing to therapeutic advancements in cardiovascular disease, using my experience and motivation as a driving force.

What are some challenges, considerations, and risks that are specific to clinical research in congenital heart disease?

Congenital heart disease affects about 1% of newborns, making congenital heart defects (CHDs) the most common type of birth defect. A quarter of these cases are complex enough to require open-heart surgery during infancy, and CHD is a leading cause of death among infants and children. Fortunately, advances in surgical techniques have reduced the mortality rate in those born with heart defects. However, significant morbidity still exists, as about 40% of adults born with heart defects experience a disability. This leads to the need for lifelong cardiac care with high healthcare costs.

Despite CHD being the most common birth defect, these conditions are understudied, and research is underfunded. As a result, the available treatments for those with CHD often lack empirical data. CHD research is challenging due to small populations with specific conditions and low clinical event rates. This often results in inconclusive results in the trials that are performed with limited clinical impact.

Adaptive study designs offer a promising approach for clinical trials in congenital heart disease. They provide flexibility, efficiency, and better decision-making, which can address the unique challenges of this patient population. To ensure the success of such trials, it's essential to engage an experienced Contract Research Organization (CRO) capable of managing the complexities of adaptive designs. This includes advanced planning, monitoring, and statistical analyses, as well as quickly executing necessary adaptations during the trial. Medpace has extensive experience in clinical trials of rare diseases, making them well suited for these types of trials.

What are some of the unique hurdles faced when conducting pediatric heart disease trials?

Pediatric heart disease trials pose several unique challenges, including ethical concerns related to children's involvement, difficulties in recruitment and retention, and age-specific considerations. Children with heart disease are not only a vulnerable population due to their age, but also because of their compromised health status. This raises ethical concerns related to informed consent, assent, and the balance between potential benefits and risks for these patients. Retention can also be challenging because trials often require long-term follow-up. This can be challenging due to factors such as changes in the child's health status, family relocation, or loss of interest in participation. Maintaining engagement with the child and their family is essential for successful retention. Additionally, age-specific considerations, such as children's rapidly changing physiology, require attention to age-appropriate dosing, formulation, and treatment administration. Also, selecting appropriate endpoints for these trials requires careful consideration.

Tackling these challenges requires researchers to think outside the box and embrace innovative trial designs, like adaptive designs, using appropriate surrogate endpoints, or even considering historical controls. It's also important to work closely with experts from various fields. Multidisciplinary collaboration is key, bringing together healthcare providers such as pediatric cardiologists, cardiac surgeons, nephrologists, anesthesiologists, and partnering with patients, families, and clinical trial experts to ensure the trials are executed seamlessly. By adopting a team-focused approach, researchers can address these challenges and, ultimately, achieve successful trial outcomes.

How have recent breakthroughs in precision medicine offered a new hope for patients, specifically those with cardiomyopathy?

Precision medicine has brought new hope for both pediatric and adult patients with rare cardiomyopathies by offering more personalized and targeted treatments. This approach involves tailoring medical interventions to an individual's unique genetic makeup, lifestyle, and environmental factors. Genetic testing can identify specific gene mutations causing various forms of cardiomyopathy, helping clinicians better understand the disease and create tailored treatment strategies.

Developments in precision medicine have led to targeted therapies that address the molecular pathways or genetic mutations at the core of various inherited cardiomyopathies. One exciting form of gene editing technology is CRISPR/Cas9, an innovative gene editing technology, that offers tremendous potential for correcting the disease-causing mutations in these heart conditions that impact individuals from childhood through adulthood. Having witnessed many patients struggling with these debilitating conditions or needing heart transplants, I am excited about how gene therapies can potentially provide treatment options to alter the trajectory of these devastating diseases.

What do you see in the future for trends in cardiovascular clinical trials?

I foresee several trends that are likely to shape cardiovascular clinical trials, mainly driven by advances in technology. There is likely to be adoption of more digital health technologies, such as wearable devices, remote monitoring, and telemedicine, in cardiovascular clinical trials. These technologies can improve data collection, patient adherence, and overall trial efficiency, while also reducing the cost and the burden on patients. Also, it is inevitable that the use of artificial intelligence and machine learning algorithms in clinical trials will become more prevalent. These technologies can identify potential trial participants by analyzing electronic health records and can also be used to optimize trial design and analyze large volumes of data more efficiently, ultimately accelerating the drug development process. AI has immense potential in clinical trials, and I believe that we've barely scratched the surface of its many applications in this field.

I also believe that there will be a growing emphasis on making clinical trials more patient-centric, ensuring that patients' needs and values are considered throughout the trial process. This will likely involve having patients and advocacy groups be involved from the outset of trial design with a goal to reduce patient burden and focus on what is most important to patients.

What motivates you and your interest in clinical research – particularly in cardiovascular research?

As a cardiologist who now works at a CRO, my motivation stems from a desire to make a real impact on patients' lives. I have treated patients with many diverse heart conditions and witnessed firsthand the challenges they face and the limitations of existing treatment options. I carry vivid memories of specific patients with various heart conditions, and I keep them in mind as I participate in the development of new therapies and innovative medical interventions. This connection to patients fuels my determination to do everything in my power to advance the field, with the hope of improving their lives and the lives of countless others.

Additionally, I have always been interested in the newest cutting-edge technologies and cardiovascular research offers exciting advancements in areas like precision medicine, artificial intelligence, and digital health technologies. Being at the forefront of these innovations allows me to be continuously learning. This not only enriches my professional experience but also drives me to push the boundaries of what's possible in cardiovascular care.

Ultimately, my passion for clinical research in cardiovascular medicine is fueled by the potential to make a lasting difference in patient outcomes and to be part of a community that's dedicated to discovering novel treatments and approaches for the betterment of heart health.

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