JSPCCS-AHA Joint Session

Fri. Jul 11, 2025 10:30 AM - 12:00 PM JST | Fri. Jul 11, 2025 1:30 AM - 3:00 AM UTC Room2（Fine Arts Center 1F Middle Auditorium）

JSPCCS-AHA Joint Session(II-AHAJS)
Surgical Treatment of Pediatric Heart Failure

Chair:Yoshihide Mitani（Perinatal Care Center, Mie University Hospital, Mie University Hospital, Mie University Graduate School of Medicine）
Chair:Antonio G. Cabrera（Nationwide Children's Hospital, The Ohio State University, Ohio）

[II-AHAJS-1]

Keynote Lecture: The landscape of heart failure and mechanical support from children to adults: towards keeping the heart you got

○Antonio G. Cabrera (Nationwide Children's Hospital, The Ohio State University, Ohio)

[II-AHAJS-2]

Mechanical Circulatory Support in Children

○Joseph Rossano[1,2] (1.Children's Hospital of Philadelphia, 2.Perelman School of Medicine at the University of Pennsylvania)

[II-AHAJS-3]

Adult Congenital Heart Disease and Heart Failure

○Curt Daniels (The Ohio State University Nationwide Children's Hospital)

[II-AHAJS-4]

Long term mechanical circulatory support in children waiting for Heart transplantation in Japan

○Mikiko Ishido[1], Takeshi Shinkawa[2] (1.Department of Pediatric and Adult congenital Cardiology, Tokyo Women's Medical University, Tokyo, Japan, 2.Department of Thoracic Cardiovascular Surgery, Tokyo Women's Medical University, Tokyo, Japan)

[II-AHAJS-5]

Mechanical Circulatory Support in Children with Fulminant Myocarditis

○Yusuke Ando, Hiromichi Sonoda, Tatsushi Onzuka, Kunihiko Joo, Tomoki Ushijima, Hirofumi Onitsuka, Hikaru Uchiyama, Akira Shiose (Department of Cardiovascular Surgery, Kyushu University, Fukuoka, Japan)

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[II-AHAJS-1] Keynote Lecture: The landscape of heart failure and mechanical support from children to adults: towards keeping the heart you got

○Antonio G. Cabrera (Nationwide Children's Hospital, The Ohio State University, Ohio)

Heart failure in children and young adults continues to represent a challenge. The heterogeneity of heart failure related-congenital heart disease, the limited options for long term mechanical support based on size and the limited evidence for the use of guideline directed medical therapy in children restrict our ability to manage these patents safely inside and outside of the hospital. On this talk, we will discuss the lessons learned from adult and pediatric-based studies on the management of acutely decompensated heart failure & cardiogenic shock and the potential implications for promotion of myocardial recovery in children including therapeutics targets and mechanical support.

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[II-AHAJS-2] Mechanical Circulatory Support in Children

○Joseph Rossano[1,2] (1.Children's Hospital of Philadelphia, 2.Perelman School of Medicine at the University of Pennsylvania)
Keywords：ventricular assist device、heart failure、congenital heart disease

Mechanical circulatory support (MCS) has emerged as a critical therapy for children with end-stage heart failure due to cardiomyopathy or congenital heart disease (CHD). Over the past several decades, the field has advanced from rudimentary extracorporeal support options to sophisticated temporary and durable devices. This presentation will begin with a brief history of MCS in children, highlighting key milestones and the evolving indications for support. The current landscape of MCS will be reviewed, including both temporary devices such as extracorporeal membrane oxygenation (ECMO), short-term ventricular assist devices (VADs), and durable VADs such as the Berlin Heart EXCOR and implantable continuous-flow devices such as the HeartMate 3. Special attention will be given to patient selection, device-specific considerations, and outcomes in both cardiomyopathy and CHD populations. Finally, we will explore the future of pediatric MCS, including emerging technologies, innovation in miniaturization, novel pump designs, and strategies for myocardial recovery and bridge to transplant. The talk will emphasize the importance of multidisciplinary collaboration, data-driven approaches, and research in improving outcomes for children supported with MCS.

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[II-AHAJS-3] Adult Congenital Heart Disease and Heart Failure

○Curt Daniels (The Ohio State University Nationwide Children's Hospital)
Keywords：Adult Congenital Heart Disease、Heart Failure、Goal Directed Medical Therapies

Due to advances in surgical and medical congenital heart disease care, more than 90% of patients are expected to survive to adulthood, and as such, there are more adults than children living with congenital heart disease. However, long term survival is reduced for adults with congenital heart disease (ACHD), and heart failure is a major cause of morbidity and the leading cause of mortality. Compared to patients with acquired HF, the ACHD population with HF is unique and includes those with complex forms of CHD, systemic right ventricles, and single ventricle anatomy with Fontan palliation. Additionally, there is a lack of data and lack of evidence to support most medical therapies in ACHD HF and patients are less likely to be treated with advanced HF therapies, including durable mechanical circulatory support or heart transplant. However, there is hope for improving outcomes. New information and technology, advanced education and training, programmatic accreditation, and more recent data have emerged to improve our understanding and care for the ACHD HF population including recent studies with medical therapies, new training guidelines for ACHD HF, utilizing ambulatory hemodynamic monitors, and risk scoring for advanced therapies and transplant listing.

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Chair:Antonio G. Cabrera（Nationwide Children's Hospital, The Ohio State University, Ohio）

[II-AHAJS-4] Long term mechanical circulatory support in children waiting for Heart transplantation in Japan

○Mikiko Ishido[1], Takeshi Shinkawa[2] (1.Department of Pediatric and Adult congenital Cardiology, Tokyo Women's Medical University, Tokyo, Japan, 2.Department of Thoracic Cardiovascular Surgery, Tokyo Women's Medical University, Tokyo, Japan)
Keywords：Ventricular assist device、Heart transplantation、wait list

In Japan, ＞95% of children underwent orthotopic heart transplantation (HTx) were supported by ventricular assist device(VAD). This is mainly because long waiting time, as long as 675 days in children. There're only 16 pediatric HTxs in 2023 where there're 50 new patients (Pt) considered to require HTx every year. Since 2015, Berlin Heart EXCOR was introduced in Japan, and it allows Pt to wait long period, as long as 4 years in our institute. The 10ml pump has been utilized mostly which's unusual for other countries. Nevertheless, we could keep serious complication rate and mortality low, probably due to precise anticoagulation and meticulous wound disinfection. But physical restraint and long hospital stay result in developmental delay and motor dysfunction in some cases. Also, one of the family members needs to stay with Pt in the hospital for 24/7 in most cases, which can influence on the family especially siblings. Therefore, we've been trying to use implantable VAD (iVAD) for children ＞20kg. The youngest Pt supported by Heartmate-III is 6 years old in our experience. iVAD allows Pt to go home and back to school. We give VAD training to not only Pts' family, but school teaches. Pt or the family take care of the exit site of the drive line every day, coagulation check 1-2 times a week, mechanical checkup with clinical engineer and outpatient clinic with cardiologist or surgeon 1-2 times a month are the routine for iVAD Pt. Minor stroke, subarachnoid bleeding, and drive line infection are the major complications in our cases without delisting or mortality so far.

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[II-AHAJS-5] Mechanical Circulatory Support in Children with Fulminant Myocarditis

○Yusuke Ando, Hiromichi Sonoda, Tatsushi Onzuka, Kunihiko Joo, Tomoki Ushijima, Hirofumi Onitsuka, Hikaru Uchiyama, Akira Shiose (Department of Cardiovascular Surgery, Kyushu University, Fukuoka, Japan)

Keywords：fulminant myocarditis、ECMO、ventricular unloading

Objectives: Venoarterial extracorporeal membrane oxygenation (V-A ECMO) is crucial for pediatric fulminant myocarditis but can increase afterload and cause left ventricular (LV) distention. We evaluated LV unloading during V-A ECMO. Methods: We analyzed 19 pediatric patients treated with V-A ECMO for fulminant myocarditis from 2010 to 2024. Patients were divided into ECMO alone (n=9) and ECMO with LV unloading (n=10). Indications for unloading included LV distention, pulmonary congestion, thrombi, and blood stagnation. LV unloading was done via transapical cannulation (n=9) or Impella (n=1). Four patients received unloading at ECMO initiation, six as rescue therapy. Median time to unloading was 281 minutes. Results: Baseline characteristics were similar, but extracorporeal CPR was more frequent in the unloading group (33% vs. 80%, P=0.07). Survival was higher in the unloading group (44% vs. 80%, P=0.17), with lower cardiac mortality (33% vs. 0%, P=0.09). Pulmonary congestion resolved faster in the unloading group (6 vs. 2 days, P＜0.05). Weaning rates from ECMO and ventilation were similar. Tamponade occurred more frequently in the unloading group (0% vs. 40%, P=0.09). No significant differences were seen in support duration, renal therapy, infection, stroke, or ejection fraction at recovery. Conclusion: LV unloading showed favorable trends with faster pulmonary recovery. Increased tamponade risk requires careful unloading method selection. Early unloading should be considered for LV distention or pulmonary congestion. Impella may reduce tamponade risk in larger children.