

JSPCCS-AEPC Joint Session

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[AEPCJS] JSPCCS-AEPC Joint Session (II-AEPCJS)

Optimization and transitional care of cardiac pacing and resynchronized therapy in congenital heart disease

Chair:Nico A. Blom(Leiden University Medical Center and Amsterdam University Medical Center, The Netherlands)

Chair:Shin Ono(Kanagawa Children's Medical Center)

[II-AEPCJS-4] Cardiac Pacing for Hemodynamic Optimization in Congenital Heart disease

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Keywords : Pacemaker、 Congenital Heart Disease、 Hemodynamics

Pacemaker setting can positively or negatively affect hemodynamics. On the other hand, in the patient with congenital heart disease (CHD), their underlying disease and hemodynamic are widely heterogeneous. Therefore optimal device programming should be individualized. Two representative CHD conditions are discussed.

I. Pacing rate in diseased subpulmonary RV

In patients with a diseased subpulmonary RV and preserved LV function, LV performance increases with increasing HR through the force frequency relationship. This may enhance RV performance via ventriculo-ventricular interaction and a reduction in RV afterload. As a result, RV output improves, leading to an increase in LV preload. According to the Frank-Starling law, LV performance further increases. Overall, this may result in favorable hemodynamics. Therefore, the appropriate HR in patients with a failing RV and preserved LV function may be higher than that in those with LV failure. In these patients with sinus node dysfunction, early pacemaker implantation and a higher pacing rate are warranted.

II. Ventricular pacing in systemic RV

Ventricular pacing itself is not always harmful in systemic RV. AV sequential pacing may improve hemodynamics by correcting AV dyssynchrony. However, LV pacing in systemic RV is known to deteriorate hemodynamic in the long term.

Because RV anatomy differs from the LV, the pattern of RV dyssynchrony also differs from that of the LV. Careful assessment of RV dyssynchrony caused by ventricular pacing is required. When dyssynchrony is present, early indication for physiological pacing is crucial.