

## **Epicardial vs Endocardia Pacing System**

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The number of pediatric pacemakers implanted is still relatively small. Pacing in the pediatric population typically results from bradycardia produced by sinus node dysfunction or atrio-ventricular block. Complicated issues are involved in pacing device implantation in children, such as their small physical size, somatic growth, and the presence of cardiac anomalies [1,2]. Generally, epicardial leads are commonly used in small infants. However, pacemaker implantation using epicardial leads is invasive because a thoracotomy is required and sometimes the leads are problematic. Recently, the use of endocardial leads is increasing worldwide due to their various benefits over epicardial leads, such as minimal invasiveness, lower pacing threshold, and longer generator longevity [3]. However, endocardial leads are not suitable for patients with intracardiac shunts because of the high risk of systemic thrombosis [4]. Venous occlusion is another significant problem with endocardial leads in small children, because the diameters of their vessels are smaller than those of adults [2,5,6]. Transvenous ventricular pacing leads across the tricuspid valve may cause or exacerbate tricuspid regurgitation [7]. The use of epicardial leads has the advantage that it avoids the risks associated with the use of endocardial leads. Steroid-eluting epicardial leads prevent threshold increase in the long term, reducing lead troubles [2,8]. In newborns and

older infants, steroid-eluting epicardial leads have been used with excellent long-term outcome [8,9]. There are only a few reports on pacemaker lead infections in children, and the reported incidence was 2 ~ 7.8 % [10-12]. In adult reports, there was no difference in infection rate between epicardial and endocardial leads [12]. Generally, an epicardial leads are favored in a child with a small body size (body weight < 10 ~ 20 kg) [3,4]. On the other hand, there is a global trend towards using endocardial leads in younger patients [3,10,13].

|   | <b>Epicardial lead</b>   | <b>Endocardial lead</b>                                |
|---|--|--|
| Invasiveness                                  | Maximum (thoracotomy or sternotomy)  | Minimum  |
| Incidence of high threshold and lead troubles | Higher than endocardial lead, but steroideluting epicardial lead reduces the risk of lead troubles | Comparatively few                                      |
| Systemic thrombosis                           | None   | High risk in a patient with an intracardiac shunt      |
| Venous occlusion                              | None   | Possible   |
| Valve problem                                 | None   | Significant tricuspid regurgitation                    |
| Lead removal due to device infection          | Thoracotomy or sternotomy is required  | Transvenous lead extraction, but there is still little |

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experience of this procedure  
in children. (pm, OHS)

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