

# First implantation of a HeartMate 3 left ventricular assist device in Poland

Pierwsza w Polsce implantacja urządzenia do wspomagania lewej komory serca typu HeartMate 3

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An estimated 2–3% of the total European population suffer from heart failure (HF). The size of the population that fulfils the definition of advanced HF may exceed 60 thousand patients. Between them 10–15 thousand meet the criteria for cardiac transplantation or mechanical circulatory support devices. The gold standard for management of advanced HF is cardiac transplantation (HTX), but because of the scarcity of donor organs it cannot alone address the global epidemic of HF. As a consequence, alternate treatment options have been used, such as chronic mechanical circulatory support (MCS). In 2014, only 76 HTXs were performed throughout Poland, and 16% (n = 90) of patients died whilst on the waiting list for a heart transplant. Nowadays approximately 90% of patients being considered for MCS receive a left ventricular assist device (LVAD) as a bridge to transplantation or destination therapy for those deemed transplant ineligible. Data from the International Society for Heart and Lung Transplantation registry show that up to 41% of all patients undergo transplantation with an LVAD in place. More widespread adoption of ventricular assist device (VAD) technology has resulted in a 2500% increase in LVAD implants in the last eight years. Actuarial survival at one and two years following continuous-flow LVAD implantation has reached 80% and 70%, respectively. The majority of patients discharged home following VAD implantation can achieve a modicum of independent living. Decisions about candidacy for transplantation or MCS should be made by an experienced, multidisciplinary team. The HeartMate 3 LVAD (Fig. 1) is a new compact, intrapericardial, centrifugal-flow pump with a full magnetically levitated rotor and a wide range of operation (2–10 L/min) to accommodate a broad range of clinical needs. It generates lower power consumption and is designed to minimise the following: sheer stress and stasis, haemolysis, effects on von Willebrand factor and platelet activation. The Full MagLev technology enables rapid speed changes and allows the development of artificial pulsatile flow. The HeartMate 3 CE Mark Study was the first human experience with this LVAD. It demonstrated exceptional 30-day (98%) and six-month (92%) patient survival, no incidence of pump thrombosis, haemolysis, pump malfunction, or exchange at 30 days and 180 days, progressive sustained quality of life improvements, and a significant reduction in HF symptoms at six months. The pump was successfully implanted through a median sternotomy in a 41-year-old man with the diagnosis of dilated cardiomyopathy post myocarditis with frequent hospitalisations for HF and New York Heart Association IIIb/IV functional limitations despite optimal medical therapy. He was classified as Intermacs profile 4. The cardiac index was 1.43 L/min/m<sup>2</sup>, and the left ventricular ejection fraction was from 10% to 12%. The postoperative period was complicated by transient right ventricular failure and renal insufficiency without need for dialysis. The patient was discharged home on postoperative day 26 with significant improvement in HF symptoms.



Figure 1. The HeartMate 3 left ventricular assist device

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**Conflict of interest:** P. Litwiński, M. Jasińska, J. Szymański, M. Kuśmierczyk — participants of the post-market international Elevate HM3 Registry — the purpose of this post-market registry is to collect data and evaluate the real-world experience of the HeartMate 3 left ventricular assist system in a post-approval setting.

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