






## Two decades of cardiac implantology: a single-center experience

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Thanks to technological advancements, the improvement in the quality of life, and a decline in birth rates, the average age of the world's population is increasing from decade to decade. It is estimated that by the year 2030, the percentage of people aged 65 and older will rise from 6.9% to 12.0%, and particularly in developing countries<sup>1</sup>. Pacemakers are electrical generators designed to mimic a customized pulse in terms of rate (frequency) and output power. While the pulse delivery can be temporary or permanent, the device's function is assessed and adjusted through interrogation, which includes the stimulation rate, pulse width, and voltage. These devices are typically categorized as external and internal. External pacemakers are commonly used as a temporary measure for cardiac stimulation when a temporary cause of conduction disturbances is suspected (e.g., hyperkalemia), while internal pacemakers are implanted and represent a permanent solution. The primary indications for permanent electrical stimulation are sinus node disease (I), atrioventricular conduction disorders (I), and recurrent syncope (IIa/C)<sup>2</sup>. The Implantable Cardioverter Defibrillator (ICD) is a device that, in addition to its pacing function, also has the capability for intracardiac defibrillation. Since its inception in the 1950s, distinguishing ICDs from 'pure' pacemakers has become more challenging because every ICD includes a pacing function. Devices for cardiac resynchronization therapy, or biventricular pacing (CRT-P), and those with an integrated defibrillation lead (CRT-D), are used in the treatment of heart failure in a specific patient population where improvement in cardiac function and quality of life is expected through biventricular electrical stimulation<sup>2</sup>.

In the last two decades (**Figures 1-3**), approximately 1300 pacemakers (120-140 per year) have been implanted at General Hospital "Dr. Josip Benčević", Slavonski Brod, with 58% being single-chamber stimulation devices (VVI), 154 ICD devices, 45 CRT (P and D) devices, and a dozen loop recorders. Observing new scientific advancements and their application in everyday clinical practice is of paramount importance for the proper patient care. In line with this, at our institution, starting in the fall of 2023, 5 devices with conduction system stimulation have been implanted.



**FIGURE 1.** The second invasive cardiology room was created by reconstructing a room that was used as a dressing room. Since opening in 2018, it has served as cardiac laboratory for the implantation of cardiac implantable electronic devices, for peripheral angiography and interventions, and also for electrophysiological procedures from 2019.

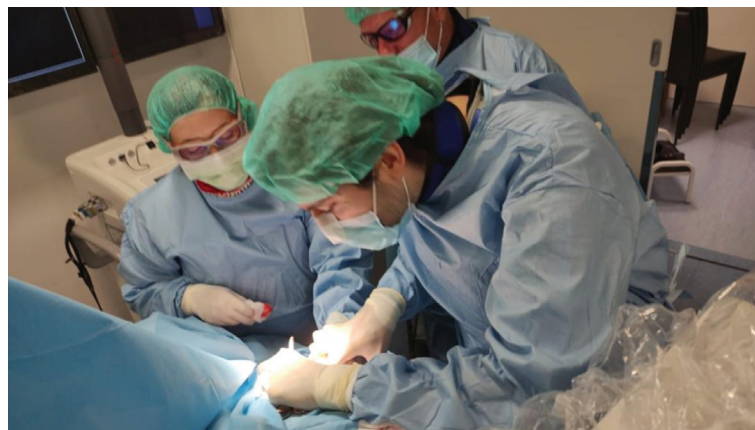
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**FIGURE 2.** Implantation of a cardiac pacemaker. In the picture from left to right, first row: Dr. Marijana Knežević Praveček, Dr. Zrinko Pešut, second row: Alenka Tuličić-Mihelčić, nurse, and Jozo Radičević, medical radiology engineer.



**FIGURE 3.** Preparation of the cephalic vein during cardioverter-defibrillator implantation. In the picture from left to right, the first row: Marina Stanković, nurse, Dr. Domagoj Vučić, and in the second row, mentor Dr. Ivica Dunder.

**LITERATURE**

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