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# Functional parameters of blood circulation in patients with permanent pacemakers in the early postoperative period in different QRS complex duration classes

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**Objective.** To perform comparative evaluation of the blood circulation functional parameters in patients with permanent pacemakers in the early postoperative period in different QRS complex duration classes.

**Materials and methods.** The investigation involved 114 patients (56 women, 58 men) with implanted pacemakers. Among pacing modes (PM) there were 40 patients with VVI/VVIR, 26 patients with AV block and with DDD/DDDR, 14 patients with CRT. A separate group was made up of 34 patients with SSS in DDD/DDDR PM. The patients' average age was 69 ± 7 years. The levels of systolic and diastolic blood pressure (BP), spontaneous and induced rhythm heart rates, QRS complex duration as well as left ventricular ejection fraction (LVEF), end-diastolic volume (EDV) and end-systolic volume (ESV), the thicknesses of interventricular septum (IVS) and posterior wall (PW) of the left ventricle, the sizes of the left (LA) and right (RA) atrials and right ventricular (RV) were assessed before pacing therapy and in the early postoperative period (3—5 days after implantation). The stimulated QRS complex duration was measured in leads II, V5, V6 and with selecting the highest measured value. The obtained data were evaluated as changes of (increase in %) QRS complex duration after pacemaker implantation in different PM. QRS complex duration in patients with SSS was accompanied by DDD/DDDR in episodes of atrial and atrioventricular pacing separately. The patients were divided into 3 stimulated QRS complex duration classes: class 1 included patients with duration under 120 mc, duration of 120—150 mc was referred to class 2, and with duration of than 150 mc to class 3.

**Results and discussion.** It has been was established, that the blood circulation functional parameters in the early postoperative period after pacemaker implantation in all pacing modes were determined by the QRS complex duration class and these values were progressively changing with an increase in the latter.

**Conclusions.** QRS complex duration may be an effective control measure of permanent pacing which should be taken into account regardless of the mode.

**Key words:** permanent pacing, cardiac resynchronization therapy, electrocardiostimulation regimens.

One of the modern methods of treatment of life-threatening arrhythmias and medical refractory chronic heart failure (CHF) is permanent pacing [PP] [3].

Dynamic monitoring of the work of the ECS is based on the monitoring of the functional parameters of blood circulation, such as the QRS complex duration, left ventricular ejection fraction (LVEF), end-systolic (ESV)/end-diastolic (EDV) volumes, systolic (SBP)/diastolic (DBP) blood pressure [1, 2, 4, 5].

M. Haghjoo et al showed a reasonable allocation of the 3 groups of patients for QRS complex duration class respectively, tying the classes of extended and significantly extended QRS complex with more severe interventricular and intraventricular dyssynchrony [10].

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The purpose of this study is to conduct a comparative evaluation of the blood circulation functional values in patients with permanent pacemakers in the early postoperative period in different QRS complex duration classes.

## Materials and methods

114 patients (56 — women, 58 — men) who underwent permanent pacemaker therapy were examined in the department of ultrasound, clinical and instrumental diagnosis and minimally invasive technologies Zaitsev V.T. Institute of General and Emergency Surgery of the NAMS of Ukraine. The average age was 69 ± 7 years. The indications for pacemaker implantation were: atrioventricular block of varying degrees (AV block) — 66 people (60 %), chronic heart failure (CHF) — 14 patients (10 %) who underwent cardiac resynchronization therapy (CRT), sick sinus syndrome (SSS) — 34 patients (30 %). In patients with AV block stimulation rate was 50 % or more, in CRT patients —