

Lecture 7 (Cardiac Pacemakers)

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SIMULATED ELECTRONICS OF BIOLOGICAL SYSTEMS

PACEMAKERS

- ✗ Sino Atrial node.
- ✗ Medical conditions requiring Pacemakers
- ✗ Pacemaker definition
- ✗ Pacemaker parts
- ✗ Round topped rectangular pulses.
- ✗ Pacemaker electrode arrangements (bipolar-unipolar).
 - + Why is the active electrode always negative??

PACEMAKER TYPES

- ✖ External pacemakers: the pacing impulse is applied through metal electrodes on the surface of the body.
- ✖ Types of pulses delivered in external pacing.
- ✖ Why is on demand R wave is better than continuous?
- ✖ Why is internal pacing better than external pacing?
- ✖ Parts of pacemakers electronic circuit.
- ✖ The output waveform types.

IMPLANTABLE PACEMAKERS

- ✗ Implantable pacemakers definition.
- ✗ The basic requirements.
- ✗ Types of implantable pacemakers.
- ✗ Codes of pacemakers (3 letter, 5 letter).
- ✗ What does every letter stands for?
- ✗ Rate responsive pacemaker
 - + Meet the physiological demand for heart rate variations.
 - + Types of sensors used (activity piezo electric sensor).

IMPLANTABLE PACEMAKERS

- ✗ Hybridization
- ✗ Why are the hybrid circuit and power sources are sealed within stainless steel case?
- ✗ Why are the materials exposed to subcutaneous environment are medical grade epoxy?
- ✗ Powers sources for implantable pacemakers
 - + Types-Advantages-disadvantages.

PACEMAKERS ELECTRODES

- ✖ Electrode job: Senses the heart electrical signal and stimulates the heart.
- ✖ Types of electrode systems (unipolar- bipolar).
- ✖ Types of electrode delivering pulse systems (myocardial, endocardial)
- ✖ Fibrous tissue around the electrode or describe the physiological changes that take place around the electrode site.

PACEMAKERS ELECTRODES

- ✖ Sutureless leads: (myocardial) definition and advantages.
- ✖ Porous Tip electrode: (endocardial) definition and advantages.
- ✖ Steroid eluting electrode: (myocardial) Definition and advantages.