



Effects of Electrocautery on St. Jude Medical Implantable Cardiac Pacemakers

Background

The use of electrocautery can affect the operation of cardiac pacemakers. While all St. Jude Medical pacemakers incorporate circuits and designs intended to prevent or minimize such effects, the high energy levels used in electrocautery can temporarily interfere with device operation or cause permanent damage. The most likely effects arise from the device sensing electromagnetic interference (EMI) generated by the electrocautery system; however, circuit damage and a direct coupling of radiofrequency energy to cardiac muscle are also possible.

Potential Effects

A summary of potential effects is provided in the table below and is based on device testing at St. Jude Medical, clinical experience and a review of the scientific literature.

Potential Effect	Estimated Frequency
Temporary inhibition of pacing	Common
Reversion to asynchronous pacing	Common
Pacing at elevated or erratic rates	Uncommon
Backup VVI pacing	Uncommon
Induction of arrhythmias or fibrillation	Rare
Circuit damage leading to erratic function or loss of pacing	Rare
Tissue damage at lead-tissue interface, leading to loss of sensing and/or elevated pacing thresholds	Rare



Recommendations

If electrocautery is necessary, the following recommendations will help minimize the potential for complications.

Before the procedure

- Pacemaker-dependent patients should have their devices programmed to an asynchronous pacing mode, with the device's sensor programmed to Off or Passive. For devices whose magnet response is programmed on, asynchronous pacing can also be induced by placing a magnet over the pacemaker.

During the procedure

- Monitor the patient's pulse and/or ECG during electrocautery.
- Keep the electrosurgical tip more than 15 cm (6 inches) away from the implanted device and pacing lead(s).
- Use short-duration, intermittent and irregular bursts at the lowest feasible energy levels.
- Position the electrocautery system's ground plate so that the current pathway does not pass through or near the pacemaker and lead(s).
- Where possible, use a bipolar electrocautery system.
- Have temporary pacing and defibrillation equipment available.

After the procedure

- A thorough pacing system evaluation by the patient's following physician should be performed, including the determination of capture and sensing thresholds.
- If the device was programmed to an asynchronous pacing mode, reprogram the device to the desired settings.

If you have any questions on this topic, please contact St. Jude Medical Technical Services at 800-722-3774.