

## Effect of RF Ablation on St. Jude Medical Implantable Cardiac Rhythm Devices

### Background

RF ablation conducts electrical current in the range of radiofrequency signals between the needle electrode and a ground plate. This current then creates heat around the electrode – destroying the target/surrounding cells. RF ablation performed in a patient with a pacemaker or implantable cardioverter defibrillator (ICD) may cause device malfunction or damage. Additionally, loss of capture may be observed but this is usually temporary and capture returns after the RF ablation procedure has been completed. It is also possible that during RF ablation the Sense Amp signal may appear as a flat line under programmer telemetry due to the large RF ablation signal saturating the sense amplifier.

### 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/or a review of the scientific literature.

Potential Effect	Estimated Frequency	
	Pacemakers	ICDs
Single beat inhibition of pacing	Common	Common
Loss of capture (usually temporary)	Common	Common
Total inhibition of pacing	Uncommon	Uncommon
Asynchronous pacing/noise reversion	Common	Common
Increased pacing rate (up to programmed Maximum Rate)	Uncommon	Uncommon
Arrhythmia induction	Uncommon	Uncommon
Inappropriate therapy delivery	Not applicable	Uncommon
Failure to deliver needed therapy	Not applicable	Rare
Damage to pacemaker/ICD	Rare	Rare

### Recommendations

In order to minimize RF ablation risks, the following precautions should be taken:

- Loss of capture often occurs during RF ablation. Pacing outputs should be programmed to 5.0 volts or higher during the RF ablation procedure.
- For pacemaker dependent patients: The device can be programmed to the SOO or DOO mode.
  - Pacemakers: Application of a magnet over the pacemaker in lieu of programming to the SOO or DOO mode will provide asynchronous pacing.
  - ICDs: Magnet application does not force asynchronous pacing in ICDs; therefore program HV therapy to Off/Disable and then program the mode to SOO or DOO.
- The pulse generator can be programmed to a non-rate responsive mode to prevent rate increases.
- The ICD can be programmed to Defib Off to prevent inappropriate therapy, if needed.
- Monitor the patient's heart rate. Surface ECG will be unreliable due to artifacts from the RF ablation procedure. Alternative methods such as pulse oximetry should be utilized.
- Avoid direct contact between the ablation catheter and the implanted leads/pacemaker/ICD.
- Position the ground plate so that the current pathway does not pass near the pacemaker or ICD system, i.e., place the ground plate under the patient's buttocks or legs.
- Have external defibrillation equipment available.

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