

# Effects of Extra Corporeal Shock Wave Lithotripsy (ESWL) on St. Jude Medical Implantable Cardiac Rhythm Devices

## Background

Shock wave lithotripsy is a medical procedure which uses a spark gap or electromagnetic transducer to produce a shock wave to break up calculi, for example in patients with kidney stones.

## Potential Effects

The lithotripter (used in a non R-wave triggered mode) shock wave may cause an additional myocardial depolarization. In the non-triggered mode lithotripters also may cause single beat inhibition, but this is generally not noticed by the patient.

Additionally, the shock wave produced by the lithotripter has the potential to permanently damage the piezoelectric crystal in the activity sensor, silicon circuitry, and other hardware components of an ICD or pacemaker, particularly if the ESWL focal point is directed towards the device.

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 depolarization (in non-triggered mode)	Common	Common
Single beat inhibition	Uncommon	Uncommon
Inappropriate therapy delivery	Not applicable	Rare
Component damage	Rare	Rare

## Recommendations

### Patient Management Before Therapy

- Program the mode to VVI or VOO. VOO pacing can also be achieved with the use of a magnet securely placed over a pacemaker.

### Patient Management During Therapy

- Keep the lithotripter focal point at least 15 cm (6 inches) away from the pacemaker or ICD, especially in devices that utilize a piezoelectric crystal in the activity sensor.
- Using a triggered mode on the lithotripter will prevent inappropriate depolarization and potential arrhythmia induction.
- Monitor the patient's heart rate during the procedure.

### Patient Evaluation following Completion of ESWL Therapy

- Following the completion of ESWL, reprogram the device back to the desired settings. If the device utilizes a piezoelectric crystal in the activity sensor, the function of the activity sensor should be assessed.

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