Interpreting Electrogram Storage Initiated by Threshold Testing in PDM and PDII Pacemakers

BACKGROUD INFORMATION
Boston Scientific pacemakers document episodes of ventricular tachycardia by storing ventricular tachy (V-Tachy) electrograms (EGMs) in memory.

In certain situations, V-Tachy EGMs can be initiated by loss of capture associated with a Manual Threshold Test.

This article provides recommendations for recognizing an EGM that is the result of manual threshold testing.

PDM: Pulsar, Discovery, Meridian
PDII: Pulsar Max II, Discovery II

CRM PRODUCTS REFERENCED*
Pulsar® Max, Discovery®, Meridian®, Pulsar Max II, Discovery II

*Products referenced herein may not be approved in all geographies. For comprehensive information on device operation, reference the appropriate product labeling.

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V-Tachy Events
A V-Tachy event recording is initiated when the ventricular rate meets or exceeds a programmable Ventricular Detection Rate for the programmed Ventricular Detection Duration. Sensed events falling both outside and inside of the ventricular refractory period are used to determine the ventricular rate. When rate and duration meet the programmed detection criteria, an electrogram (EGM) can be stored in the Arrhythmia Logbook.

V-Tachy EGM Storage Initiated by a Manual Threshold Test
It is possible that extra sensed events associated with a Manual Threshold Test will meet the programmed criteria of V-Tachy Detection, resulting in the storage of a V-Tachy EGM even though a true tachycardia is not present.

Specifically, when a Manual Threshold Test is conducted on a patient with an underlying intrinsic rhythm, the patient's intrinsic QRS complex may emerge when a paced output has failed to capture. The device counts both the paced event associated with the threshold test as well as the patient's intrinsic activity. Prolonged detection of both events may exceed the programmed V-Tachy Detection Rate and Duration criteria and initiate EGM storage. Note that the longer the threshold test is allowed to continue after capture is lost, the greater the likelihood that the Detection Duration criteria will also be met, resulting in storage of a V-Tachy EGM. As always, a Manual Threshold Test should be ended as soon as a loss of capture is recognized.

Recognizing a V-Tachy EGM Initiated by a Manual Threshold Test
V-Tachy detection and EGM storage may be the result of threshold testing if one or more of the following are true:

- The date/time of the stored V-Tachy episode correlates to the date/time of a threshold test during a patient's office visit.
- The V complex morphology changes between the non-captured/intrinsic complexes during the threshold test and the captured complexes after the threshold test has ended (Figure 1)
- Ventricular paced (non-captured) events are immediately followed by sensed (intrinsic QRS) events on the EGM
    - Note regarding PDM family: As EGM markers are not available, the V complex morphologies on the *stored* EGM may be compared to those of a *real-time* EGM to assist with identifying the VS and VP complexes.
    - Note regarding PDII family: (VS) markers are not present on the EGM during a Manual Threshold Test. The EGM may appear as: captured AP, non-captured VP, followed by intrinsic V-event (with no associated marker). The point at which the intrinsic V-event has a (VS) marker may indicate the end of a threshold test. (Figure 1)

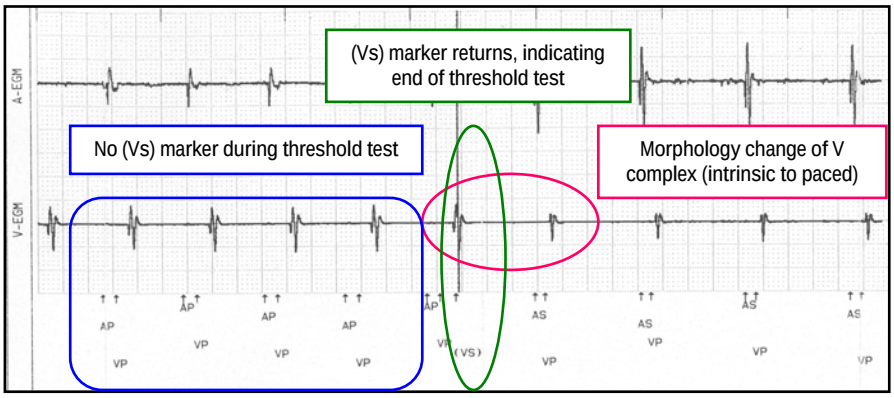

Figure 1. PDII V-Tachy EGM resulting from loss of capture during Manual Threshold Test