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A slide titled "Objectives" with a decorative background of concentric blue lines on the left side. The text "Objectives" is in bold, dark blue, sans-serif font. Below it, the text "At the end of this training, you will be able to:" is in a smaller, dark blue, sans-serif font. A bulleted list follows, with three items: "• Verbalize the difference between CRT and BIV pacing %", "• Explain the criteria for CRT Interrupt", and "• List device features to increase CRT pacing %". In the bottom right corner, the Biotronik logo is displayed, consisting of a small circular icon followed by the word "BIOTRONIK" in bold and "excellence for life" in a smaller font below it.

Objectives

At the end of this training, you will be able to:

- Verbalize the difference between CRT and BIV pacing %
- Explain the criteria for CRT Interrupt
- List device features to increase CRT pacing %

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CRT Case Study

SCENARIO

A patient is being followed on Home Monitoring and there is a significant reduction in his BiV and LV pacing. The patient is young and has recently started training for a marathon and has increased his exercise each week. He is not feeling great, but has continued to try to train.

You are brought in today to see if there is something that can be optimized for this patient so he can continue to train for his race. He was in the ER about 3 months ago and the nurse said that an EP fellow had changed some programming, but she couldn't find what had been changed.

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CRT Case Study

1. Follow Up Screen
 - Great Overview
2. Perm Programming
3. New Episodes
4. Auto Lead Testing Results
5. Diagnostics
 - Pacing %
 - Atrial Arrhythmia Burden



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CRT Case Study

1. What programming should we review?
2. VCC good safety feature
3. Ventricular pacing
 - BiV/V-V offset



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CRT Case Study

1. Trigger Pacing
 - Coordinated LV pace with sensed RV event (Right sided PVC)
2. Triggering
 - Perm and Mode Switch
 - **RVs + PVC**
 - Max Trigger Rate from UTR + 20 to **160 bpm**

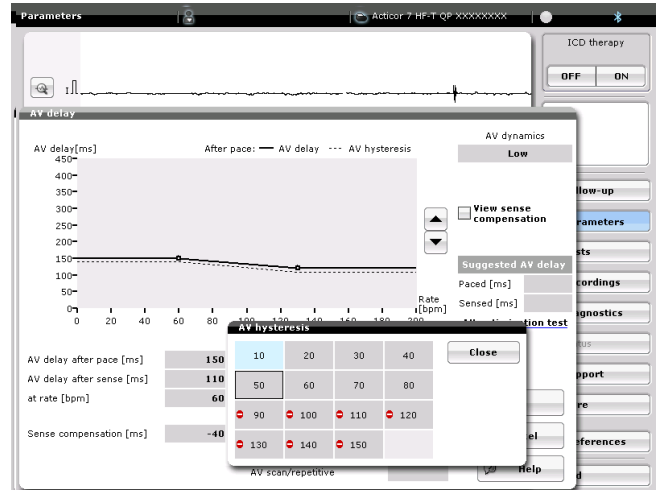


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CRT Case Study

- Optimizing the AV Delay is important in CRT patients
 - Cardiac Output
 - Complete Ventricular filling

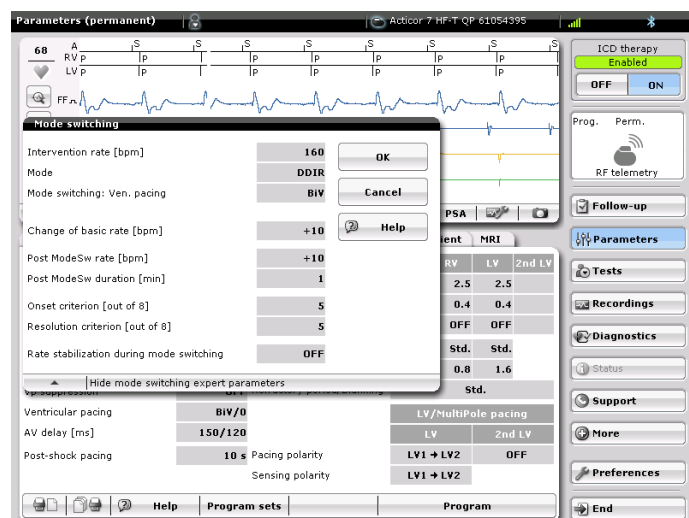


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CRT Case Study

- Rate Stabilization during Mode Switch
- Minimize sudden rate changes when patient is in Afib by providing RV pacing
 - Nominally Off

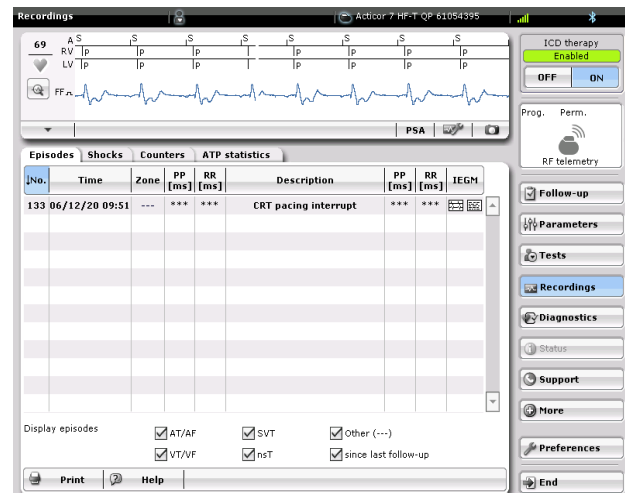


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CRT Case Study

1. CRT pacing Interrupt
2. Alert on Home Monitoring
3. Triggers an IEGM
 - 20 non-LV paced events out of 48

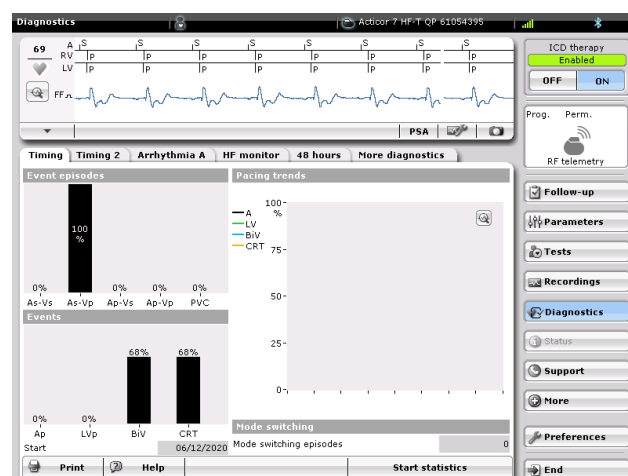


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CRT Case Study

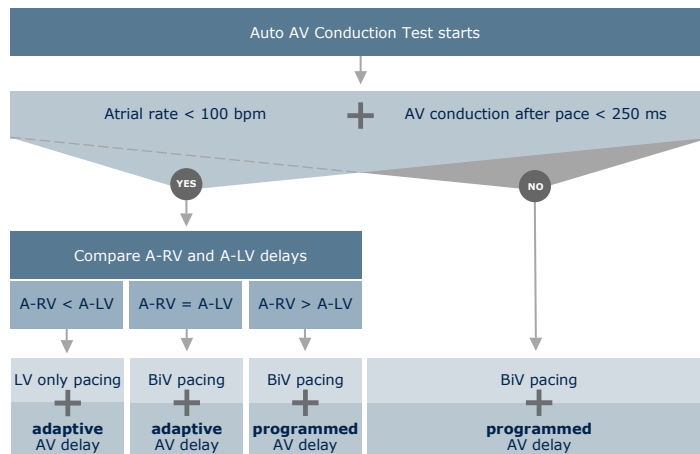
- CRT Diagnostics
 - BiV pacing = LV + RV paced events
 - CRT pacing = LV +RV AND Trigger pacing
 - CRT AutoAdapt LV only pacing



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CRT AutoAdapt Algorithm Flowchart



How does the algorithm work?

1. Check two prerequisites for continuous adaptation:
atrial rate + AV conduction after pace
2. If both criteria are fulfilled:
compare A-RV delay to A-LV delay
AND
Set LV pacing mode + delay accordingly
3. In all other cases:
Use BiV pacing + programmed AV delay

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Auto AV Conduction Test

Auto AV Conduction Test

- Every minute the intrinsic conduction is assessed.
In case of AV block the test interval is doubled, up to 17 hours.

- Test program is set as follows:

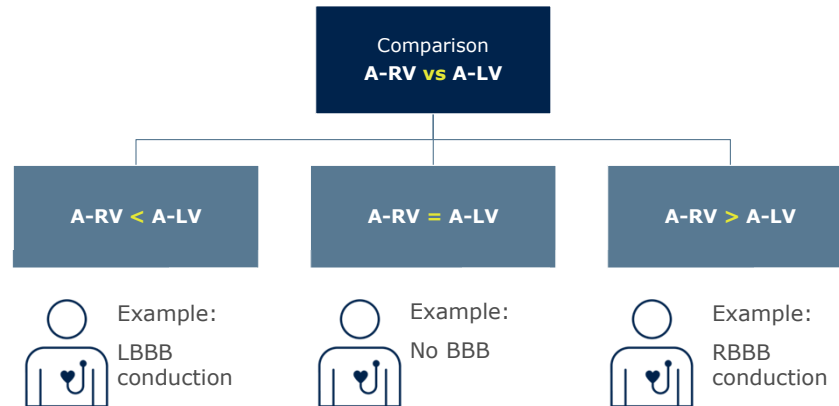
BiV	Triggering = OFF
AVp = 300 ms	VV = 0 ms

- Within one heart cycle the algorithm measures two intervals:
 - **A-RV:** AV conduction time from As or Ap to RVs
 - **A-LV:** AV conduction time from As or Ap to LVs
- The conduction measurement takes 1 heart cycle per minute → 1.4% loss of CRT pacing per day according to the average patient population (based on a mean rate of 70 bpm¹).

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AV Delays Evaluation

Based on the comparison between A-RV and A-LV, the algorithm decides on the automatic adaptation:



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Diagnostics Parameters

Statistics on CRT AutoAdapt are available in the Home Monitoring Service Center

CRT			
Left ven. pacing (LVp) [%]		87	87
BiV pacing [%]		13	14
CRT pacing [%]		100	100
CRT AutoAdapt			
Adaptive BiV pacing [%]		6	6
Programmed BiV pacing [%]		5	6
Adaptive LV pacing [%]		89	89
Mean adapted AV delay after pace [ms]		131	130
Mean adapted AV delay after sense [ms]		92	91

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CRT Case Study

1. CRT Diagnostics

- Normal Sinus node
- RV sensing when we want 100% RV pacing
- Confirms that we have reduced RV pacing



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CRT Case Study

1. 22% PVC

- Trigger Pacing turned on should now improve CRT Pacing %



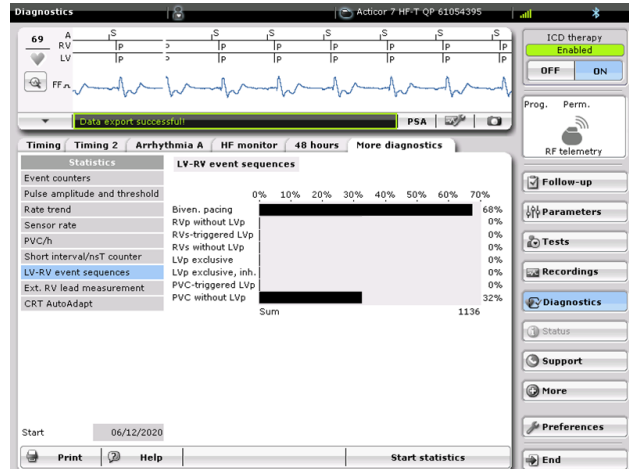
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CRT Case Study

1. More Diagnostics

- Right-sided PVC probably the culprit for low CRT pacing



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CRT Case Study

1. Tachy programming

- Physician prefers MADIT-RIT
- BIOTRONIK programming MADIT-RIT



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Three Therapy Zone Arm (Delayed)

	VF Zone	VT2 Zone	VT1 Zone
Rate	250 bpm	200 bpm	171 bpm
Counter	18 out of 24	Detection Count: 40 Redetection count: 20	Detection Count: 100 Redetection count: 22
Detection	X out of Y	Smart Detection®	Smart Detection®
Therapy	ATP One-shot + Shock	ATP + Shock	ATP + Shock

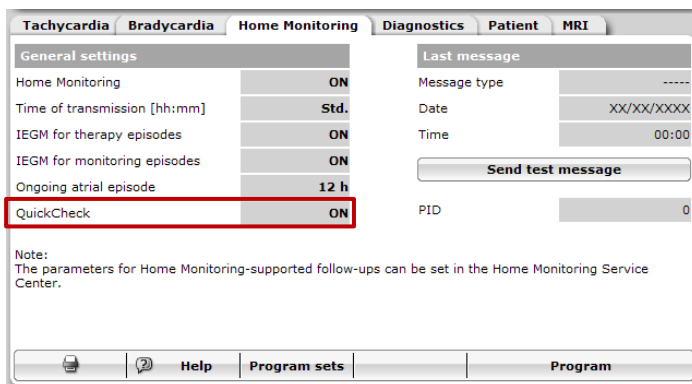
¹ Reduction in Inappropriate Therapy and Mortality through ICD Programming.
N Engl J Med 2012; 367:2275-2283

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QuickCheck – Prerequisites

QuickCheck is ON when Home Monitoring is turned ON
Available in Acticor/Rivacor and Amvia Edge

CardioMessenger Smart
with newest firmware



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QuickCheck – Available from every page

John Smith

Back to overview Patient 0 / 0 (filtered) PDF Export

Status on Jul 3, 2018 10:54 PM Acticor 7 HT-T QP / SN: 12345678
Implantation: M...

[Status](#)
[Device settings](#)
[Recordings](#)
[History](#)
[Patient profile](#)
[Options](#)
[QuickCheck](#)

[Summary](#)
[Device](#)
[Lead](#)
[Bradycardia/CRT](#)
[Atr. arrhythmia](#)
[Ven. arrhythmia](#)
[Physiologic. param.](#)
[HF monitor](#)

Automatic remark No anomalies detected

[Remote Scheduling](#)

[Quick View](#)

[Status comment](#)

[Timeline](#)

PDF Export

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Notification about arrival of QuickCheck data

BIOTRONIK Home Monitoring Service Center

Dr. Rodney McKay

QuickCheck arrived.
(by: Dr. Dummy Mustermann)
View status of patient: ilesto7ht2

Message of the day
The Home Monitoring Service Center will be down for maintenance
on Saturday, March 19, 2011
from 11:00 a.m. to 7:00 p.m. Central European Time (Berlin)
- this is March 19, 6:00 a.m. to 2:00 p.m. Eastern Daylight Time (New York)




More news

- User is notified about reception of data.
- User need not stay on QuickCheck tab, but can navigate to other patients.
- Clicking on the link in the notification redirects to the QuickCheck report.

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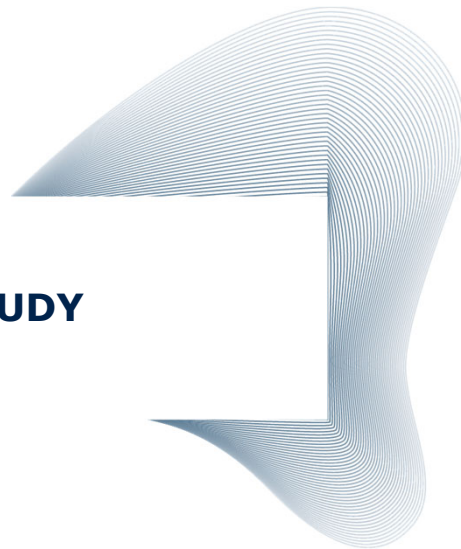
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New QuickCheck Finding

	Summary	QuickCheck transmission has arrived QuickCheck transmission has arrived on Sep 23, 2010 5:15:34 AM	 New.	 Acknowledge
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CRT CASE STUDY



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