

Remote Care Catharina ziekenhuis Eindhoven

Wat gebeurt er met een alert van een ICD, wat binnenkomt via het homemonitoring systeem?

- Wilco van Lankveld en Claire Vredegoor, Catharina ziekenhuis Eindhoven
- 16 april 2019



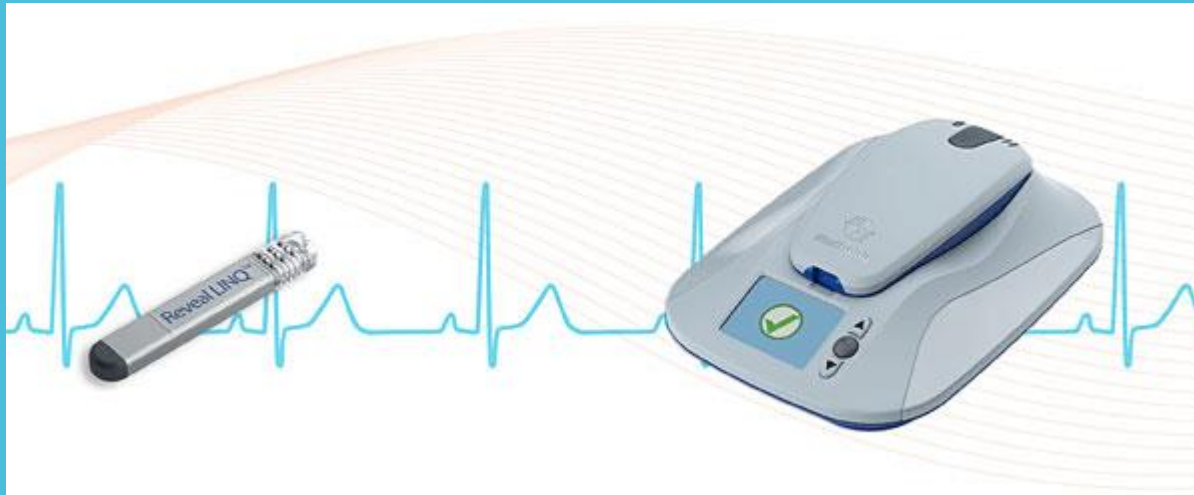
Remote care Catharina ziekenhuis

- 1700 patiënten
- Loopmonitor, pacemakers en ICD' s
- Jaarlijkse controles, alerts, hulpvraag patiënt, ondersteuning cardioloog/verpleegkundig specialist



Loopmonitor

- Implanterbare hartmonitor die gedurende (max.) 3 jaar de hartactiviteit monitort, 24 uur per dag
- Geeft geen therapie!



ICD's en pacemakers

- 1 en 2 kamer ICD's
- Biventriculaire ICD's en pacemakers op verzoek
- Toekomst alle ICD's en pacemakers



Zorg op afstand via een transmitter

- Transmitter verbinding tussen patiënt/ICD en het ziekenhuis



Automatische thuiscontrole/alerts



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Handmatige zending



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Voordelen van zorg op afstand

- Patiënt hoeft minder vaak naar het ziekenhuis te komen (polibezoek)
- Patiënt kan vanuit thuis (of waar dan ook) overleggen met het ziekenhuis
- Tussentijdse alerts worden vroegtijdigesignaleerd
- Vroegtijdig signaleren-> erger voorkomen
- Kostenbesparend
- Psychologisch/veilig gevoel



Casus 1

- Man
- 66 jaar
- VG: 2008 out of hospital reanimatie op basis van VF, PCI LAD, 2010 VT's waarvoor ICD implantatie



Casus 1

Summary
FastPath™ Summary
Episodes Summary
Diagnostics Summary

Alerts & episodes
Alert Summary
Episodes and EGMs
Extended Episodes

Diagnostics
Extended Diagnostics
Congestion Monitoring
DirectTrend™ Report

Tests
Test Results

Parameters
Parameters

Wrap-Up™ Overview
Wrap-Up™ Overview

Other
View Text Summary
View Merged Report

1 / 1 106% Invullen en ondertekenen Opmerking

Parameters

		Zone Configuration	VT	VF
Mode	VVI	Detection Criteria	187 bpm	240 bpm
Base Rate	40 bpm	Therapy (ENABLED)	ATP x2	36,0 J
			36,0 J	40,0 J
			40,0 J	40,0 J x4
			40,0 J x2	

Capture & Sense

	V
AutoCapture	Off
Pulse Amplitude	2,5 V
Pulse Width	0,5 ms
AutoSense	On
Sensitivity	Auto ^A

Diagnostics Summary

	Since 20 Jun 2016	VT/VF Episodes: 39	Since 20 Jun 2016
VP	<1 %		
		VT	VF
		39	0
		ATP Delivered	0
		Shocks Delivered	0
		SVT Episodes: 0	

Alerts

 Episodes with alert conditions (26)

Casus 1

Transmission Date : 18-12-2016 16:19

Schedule Archive Print More Actions

Summary
FastPath™ Summary
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Wrap-Up™ Overview
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View Merged Report

All Episodes Search

Date/Time	Zone/Type	CL (ms)	Therapy	Duration	EGM	Alerts
18-12-2016 16:19	Real-time EGM Freeze	N/A		0:30		
17-12-2016 23:50	VT	290	ATP	0:14		
16-12-2016 07:17	Morphology Template Update	N/A		-		
15-12-2016 10:21	VT	300	ATP x 2	0:20		
14-12-2016 05:04	VT	315	ATP	0:16		Three or more VT/VF episodes in 24 hours
13-12-2016 07:34	VT	310	ATP	0:16		Three or more VT/VF episodes in 24 hours
13-12-2016 07:31	VT	315	ATP	0:18		Three or more VT/VF episodes in 24 hours
12-12-2016 23:17	Morphology Template Update	N/A		-		
09-12-2016 10:24	VT	305	ATP	0:18		
07-12-2016 11:23	VT	310	ATP	0:14		
04-12-2016 18:55	VT	310	ATP	0:16		
04-12-2016 18:54	VT	310	ATP	0:18		
30-11-2016 15:17	Morphology Template Update	N/A		-		
27-11-2016 23:17	Morphology Template Update	N/A		-		
01-11-2016 23:17	Morphology Template Update	N/A		-		
30-10-2016 15:17	Morphology Template Update	N/A		-		
07-10-2016 02:25	VT	260	ATP	0:12		Three or more VT/VF episodes in 24 hours
07-10-2016 02:15	VT	260	ATP	0:14		Three or more VT/VF episodes in 24 hours
07-10-2016 02:14	VT	260	ATP	0:12		Three or more VT/VF episodes in 24 hours
07-10-2016 02:11	VT	260	ATP	0:12		Three or more VT/VF episodes in 24 hours
07-10-2016 02:09	VT	260	ATP	0:14		Three or more VT/VF episodes in 24 hours
07-10-2016 02:07	VT	260	ATP	0:12		Three or more VT/VF episodes in 24 hours

Mark as unviewed
Export Transmission
Send a DirectCall™
Copy transmission to disk
Contact a Colleague

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Casus 1

Episode: VT (200 bpm / 300 ms)

15 Dec 2016 10:21

VT Episode 38 of 39

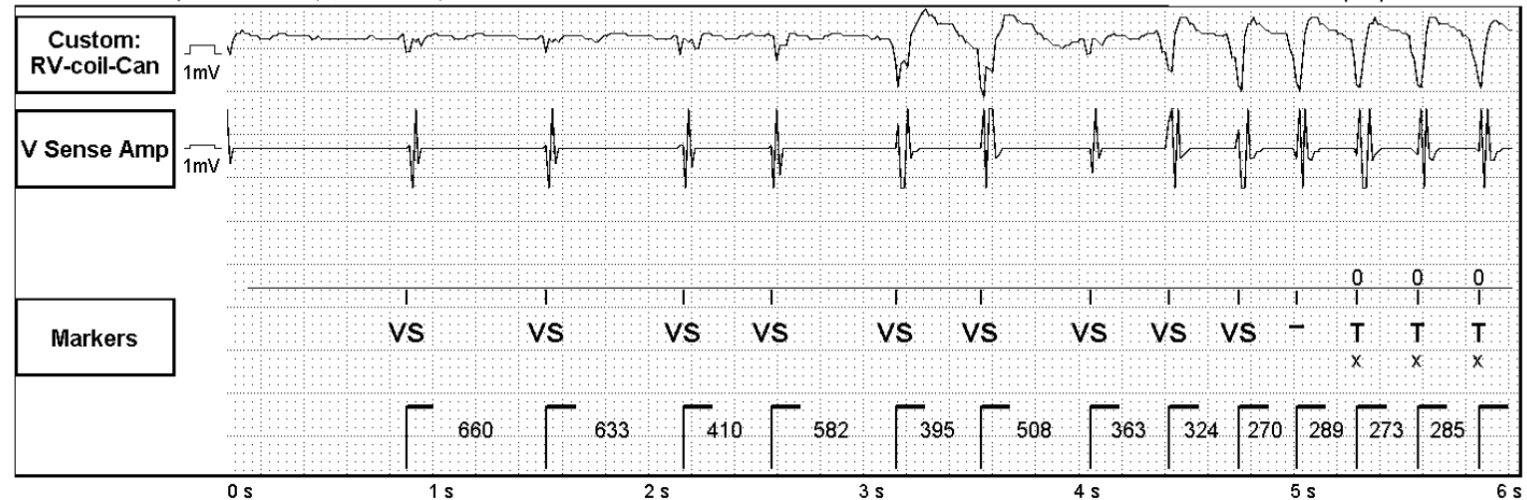
Page 2 of 3

1: RV-coil-Can AutoGain (1,1 mm/mV)

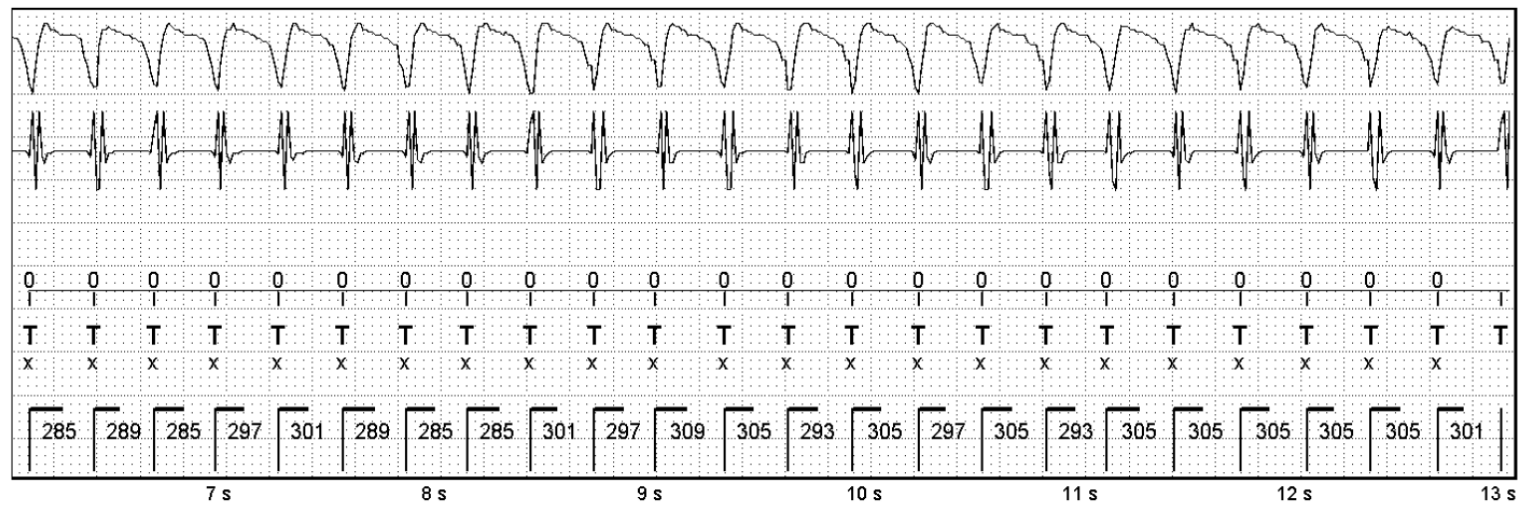
3: Markers

2: V Sense Amp AutoGain (0,4 mm/mV)

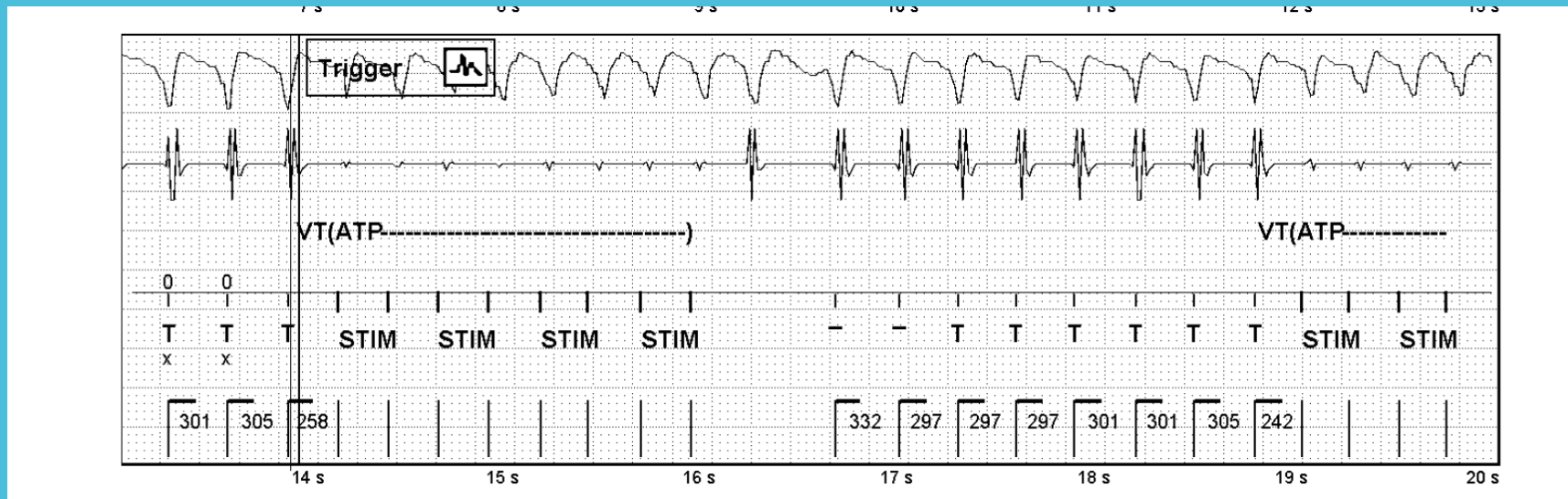
Sweep Speed: 25 mm/s



Casus 1



Casus 1



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Casus 1

Episode: VT (200 bpm / 300 ms) (Continued)

V1/VF Episode 38 of 39

Page 3 of 3

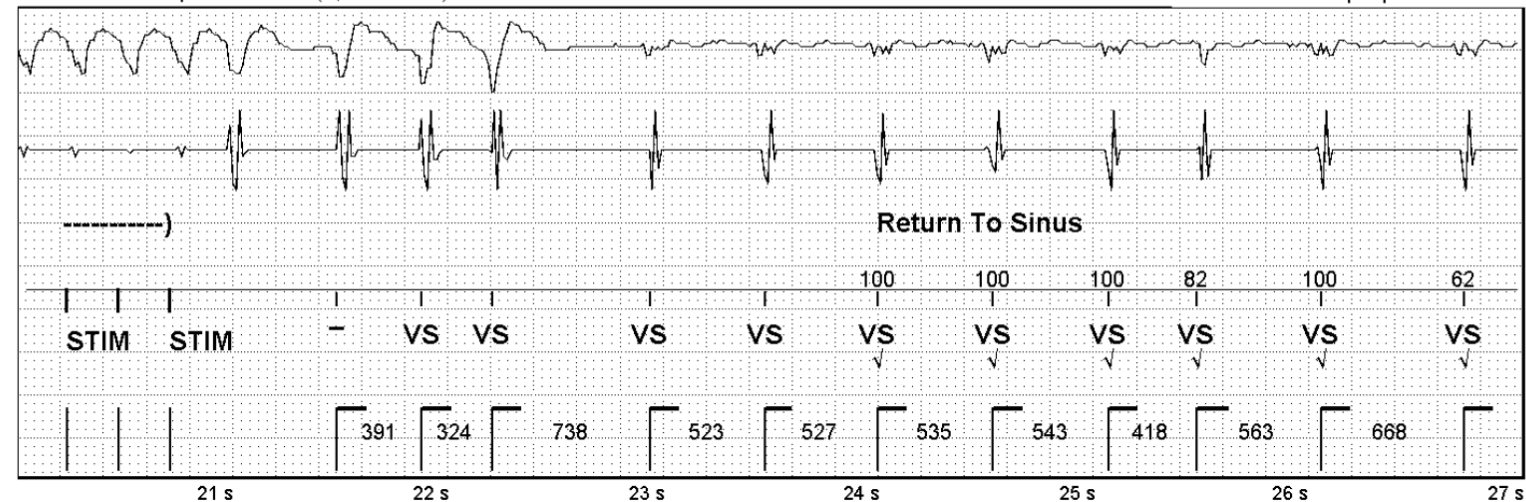
15 Dec 2016 10:21

1: RV-coil-Can AutoGain (1,1 mm/mV)

3: Markers

2: V Sense Amp AutoGain (0,4 mm/mV)

Sweep Speed: 25 mm/s



Casus 1

- Conclusie?
- Behandeling?
- Toegevoegde waarde homemonitoring?



Casus 2

- Man
- 51 jaar
- VG: out of hospital reanimatie bij VF waarvoor 1 kamer ICD



Casus 2

Transmission Date : 22-08-2017 05:30 Schedule Archive Print More Actions ▼

Summary
FastPath™ Summary
Episodes Summary
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Extended Episodes

Diagnostics
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Wrap-Up™ Overview
Wrap-Up™ Overview

Other
View Text Summary
View Merged Report

All Episodes ▼ Search

Date/Time	Zone/Type	CL (ms)	Therapy	Duration	EGM	Alerts	☐
22-08-2017 05:30	Real-time EGM Freeze	N/A		0:30			☐
22-08-2017 03:24	VF	205	ATP While Charging Aborted Defib 36 J (844 V)	0:16			☐
19-08-2017 08:44	Morphology Template Update	N/A		-			☐

[View Episodes](#)

Casus 2

Episode: VF (292 bpm / 205 ms)

22 Aug 2017 3:24

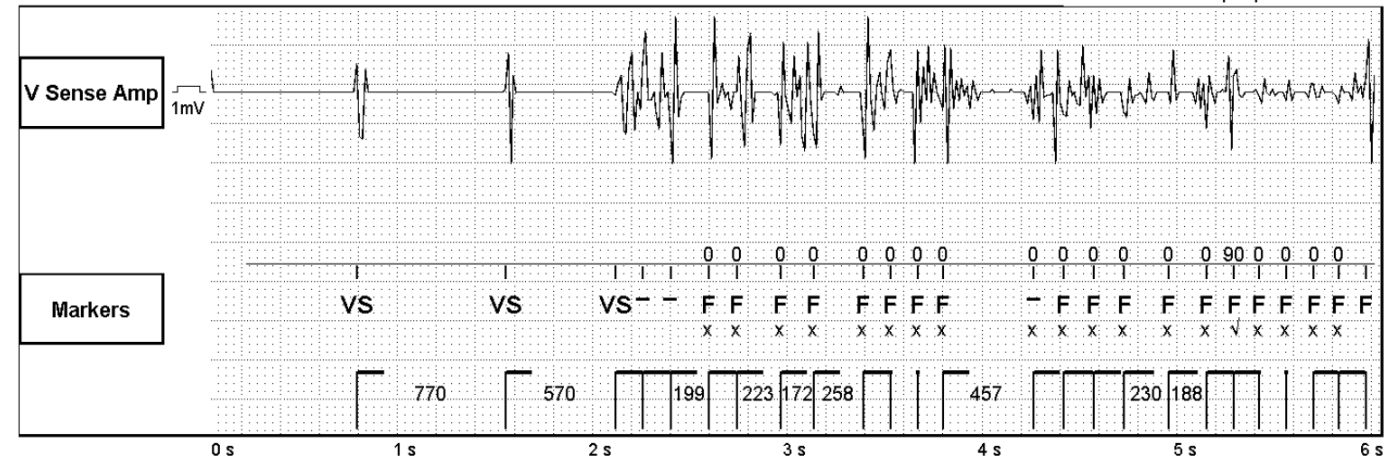
VT/VF Episode 1 of 1

Page 2 of 3

1: V Sense Amp AutoGain (0,8 mm/mV)

2: Markers

Sweep Speed: 25 mm/s



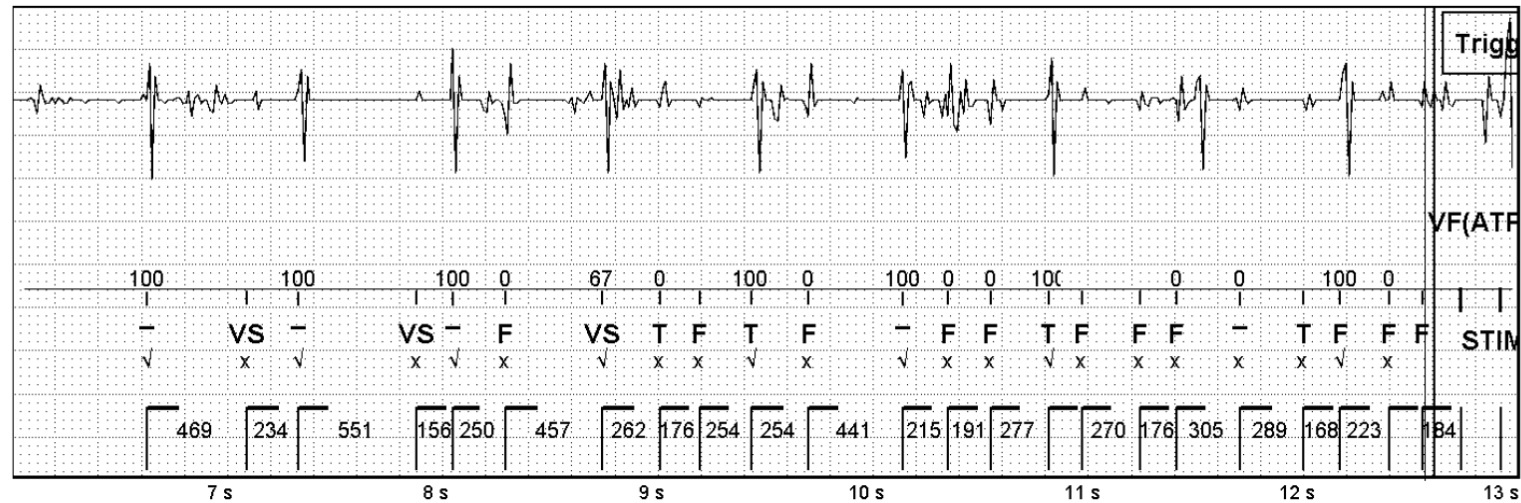
Cancel

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Casus 2

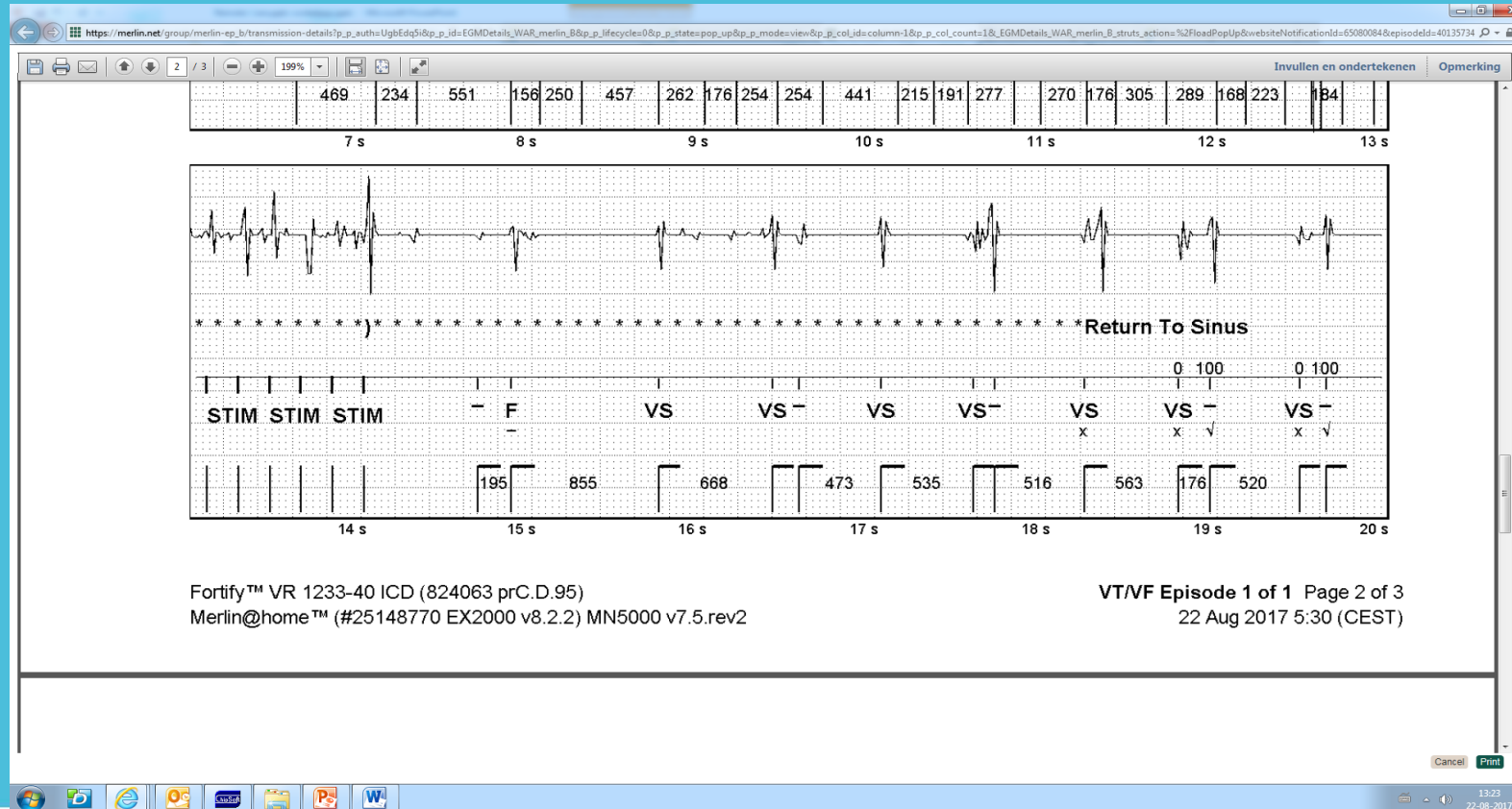


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Casus 2



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Casus 2

- Conclusie?
- Behandeling?
- Toegevoegde waarde homemonitoring?



Casus 3

- Man
- 29 jaar
- Enkele jaren hevige palpaties tijdens voetballen
- Holter en ERGO geen afwijkingen



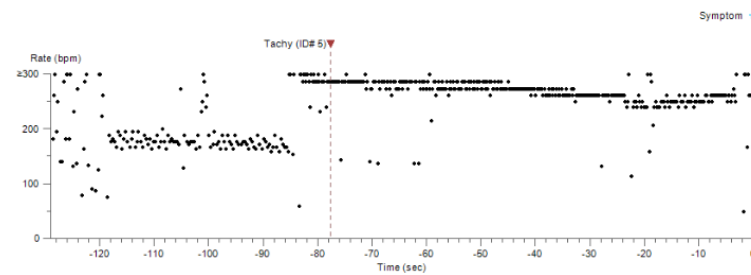
Casus 3

Note: Episode assessments that are saved after creation of Full or Summary Reports will not be displayed in those reports. To see up-to-date assessments in a PDF report, print a Current Report.

ID#	Assessment	Type	Date	Detected hh:mm	Duration hh:mm:ss	Max V. Rate	Median V. Rate	Episode Details
6	Symptom		07-Oct-2018	13:54				ECG

Symptom (Patient Activated) ID# 6

Previous Episode « » Next Episode



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Previous Episode « » Next Episode

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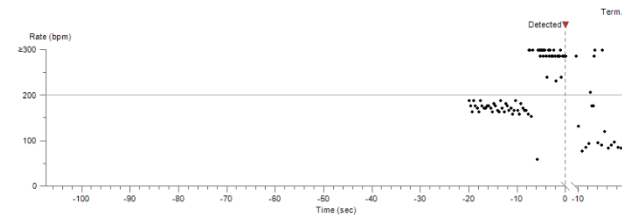


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Casus 3

Tachy (ID# 5)

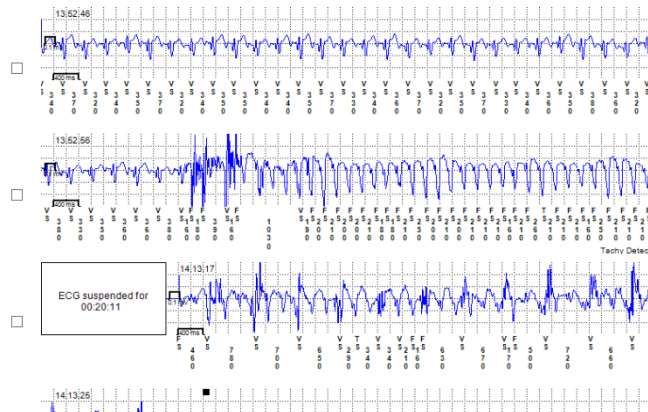
Previous Episode « » Next Episode



View/Print

☐ (all)

Zoom Amplitude



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Casus 3

- Conclusie?
- Behandeling?
- Toegevoegde waarde homemonitoring?



Casus 4

- Vrouw
- 57 jaar
- VG: hypertensie
- Palpaties, gevoel van flauwvallen

Casus 4

Current Report  

[Quick Look](#) [Episodes](#) [Trends](#) [Comments and Notes](#) [History](#)

☒ SYMPTOM ☒ Pause ☒ Tachy ☒ Brady ☒ AF ☒ AT Sort By: [Date/Time](#)

View Episodes Assessed As:
[All Episodes](#)

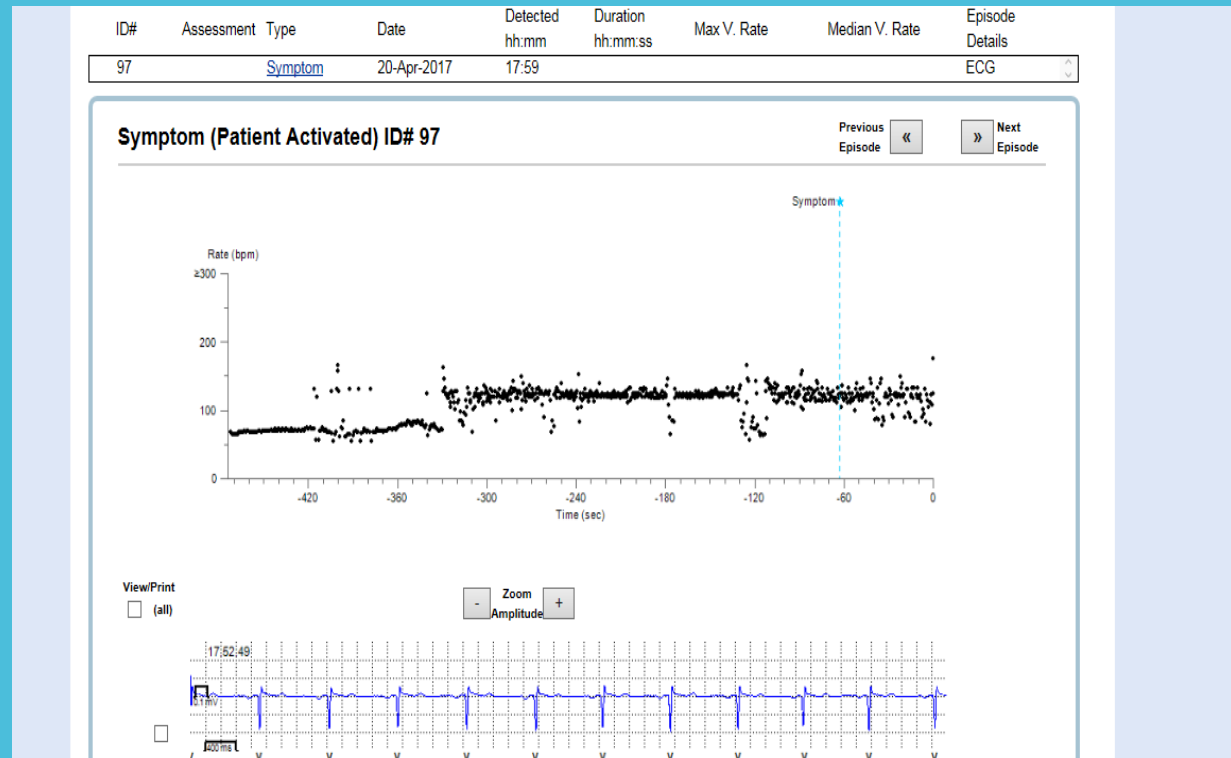
Print	ID#	Assessment	Type	Date	Detected hh:mm	Duration hh:mm:ss	Max V. Rate	Median V. Rate	Episode Details
☐	102	AF		20-Apr-2017	19:01	00:04:00	146 bpm	133 bpm	ECG
☐	101	AF		20-Apr-2017	18:49	00:06:00	158 bpm	130 bpm	ECG
☐	100	AF		20-Apr-2017	18:37	00:04:00	133 bpm	100 bpm	ECG
☐	99	AF		20-Apr-2017	18:29	00:06:00	162 bpm	133 bpm	ECG
☐	98	AF		20-Apr-2017	18:03	00:22:00	158 bpm	91 bpm	ECG
☐	97	Symptom		20-Apr-2017	17:59				ECG
☐	96	Symptom		20-Apr-2017	16:58				ECG
☐	95	AF		14-Apr-2017	08:17	00:02:00	136 bpm	133 bpm	ECG
☐	94	AF		10-Apr-2017	08:19	00:02:00	136 bpm	122 bpm	ECG
☐	93	Tachy		30-Mar-2017	14:06	00:00:07	176 bpm	176 bpm	ECG
☐	92	Tachy		30-Mar-2017	14:00	00:00:10	188 bpm	188 bpm	ECG

Assessment Legend: ☒ Appropriate ☐ Indeterminate ☒ Inappropriate

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Casus 4



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Casus 4

- Conclusie?
- Behandeling?
- Toegevoegde waarde homemonitoring?



Chadsvasc score

	Condition	Points
C	Congestive heart failure (or LV dysfunction) [⊕]	1
H	Hypertension BP>140/90 or treated hypertension on medication [⊕]	1
A ₂	Age ≥ 75 years	2
D	Diabetes Mellitus	1
S ₂	Prior Stroke or TIA or Thromboembolism [⊕]	2
V	Vascular disease (e.g. MI, PVD, Aortic plaque)	1
A	Age 65-74 years	1
S _c	Sex category (female gender)	1

Casus 5

- Vrouw
- 70 jaar
- VG: hypertensie
- 2011 screening collaps, 14 dagen holter-> geen afwijkingen, reveal na 2 weken verwijderd i.v.m. pocket infectie
- 2017 wederom collaps

Casus 5

Current Report



Quick Look

Episodes

Trends

Comments and Notes

History

☒ SYMPTOM ☒ Pause ☒ Tachy ☒ Brady ☒ AF ☒ AT

Sort By: Date/Time

View Episodes Assessed As:
All Episodes

Print	ID#	Assessment	Type	Date	Detected hh:mm	Duration hh:mm:ss	Max V. Rate	Median V. Rate	Episode Details
☐	4		Pause	30-Jun-2017	21:35	00:00:06		81 bpm	ECG
Remote Interrogation/Full Report 20-Jun-2017									
☐	3		Symptom	20-Jun-2017	13:04				ECG

Assessment Legend: ☒ Appropriate ☐ Indeterminate ☒ Inappropriate

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Important Medical Record Information

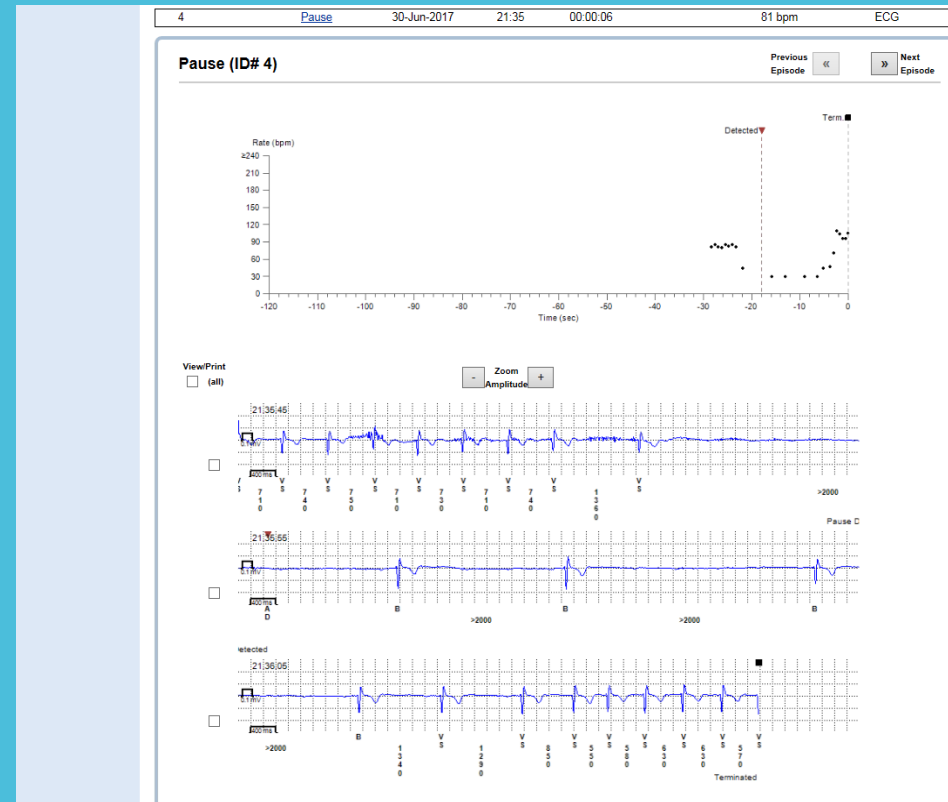
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Casus 5



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Casus 5

- Conclusie?
- Behandeling?
- Toegevoegde waarde homemonitoring?



Casus 6

- Vrouw
- 73 jaar
- VG: duizeligheid, gevoel flauw te vallen (geen collaps)



Casus 6

Current Report



Quick Look

Episodes

Trends

Comments and Notes

History

☒ SYMPTOM

☒ Pause

☒ Tachy

☒ Brady

☒ AF

☒ AT

Sort By:

Date/Time

View Episodes Assessed As:

All Episodes

Print	ID#	Assessment	Type	Date	Detected hh:mm	Duration hh:mm:ss	Max V. Rate	Median V. Rate	Episode Details
☐	28		Symptom	10-Aug-2017	17:51				ECG
☐	27		Symptom	07-Aug-2017	23:28				ECG
☐	26		Symptom	29-Jul-2017	20:55				ECG
☐	24		Symptom	22-Jul-2017	01:29				ECG
☐	23		Symptom	14-Jul-2017	12:13				ECG
☐	22		Symptom	13-Jul-2017	13:37				ECG
☐	20		Symptom	10-Jul-2017	07:44				ECG
☐	18		Symptom	07-Jul-2017	16:16				ECG
☐	17		Symptom	30-Jun-2017	07:37				ECG
☐	16		Symptom	27-Jun-2017	15:28				ECG

Assessment Legend: ☒ Appropriate ☐ Indeterminate ☒ Inappropriate

Contact Us

Important Medical Record Information

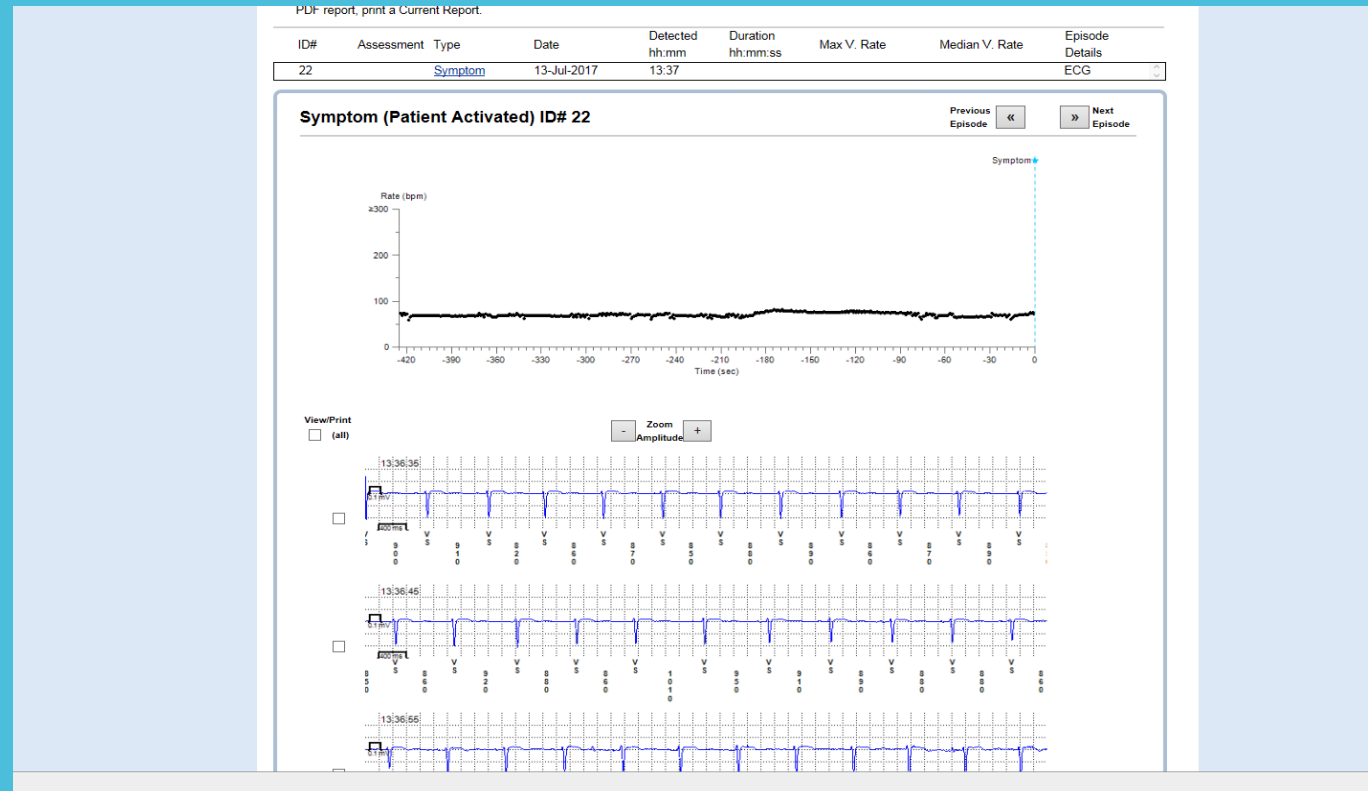
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Casus 6

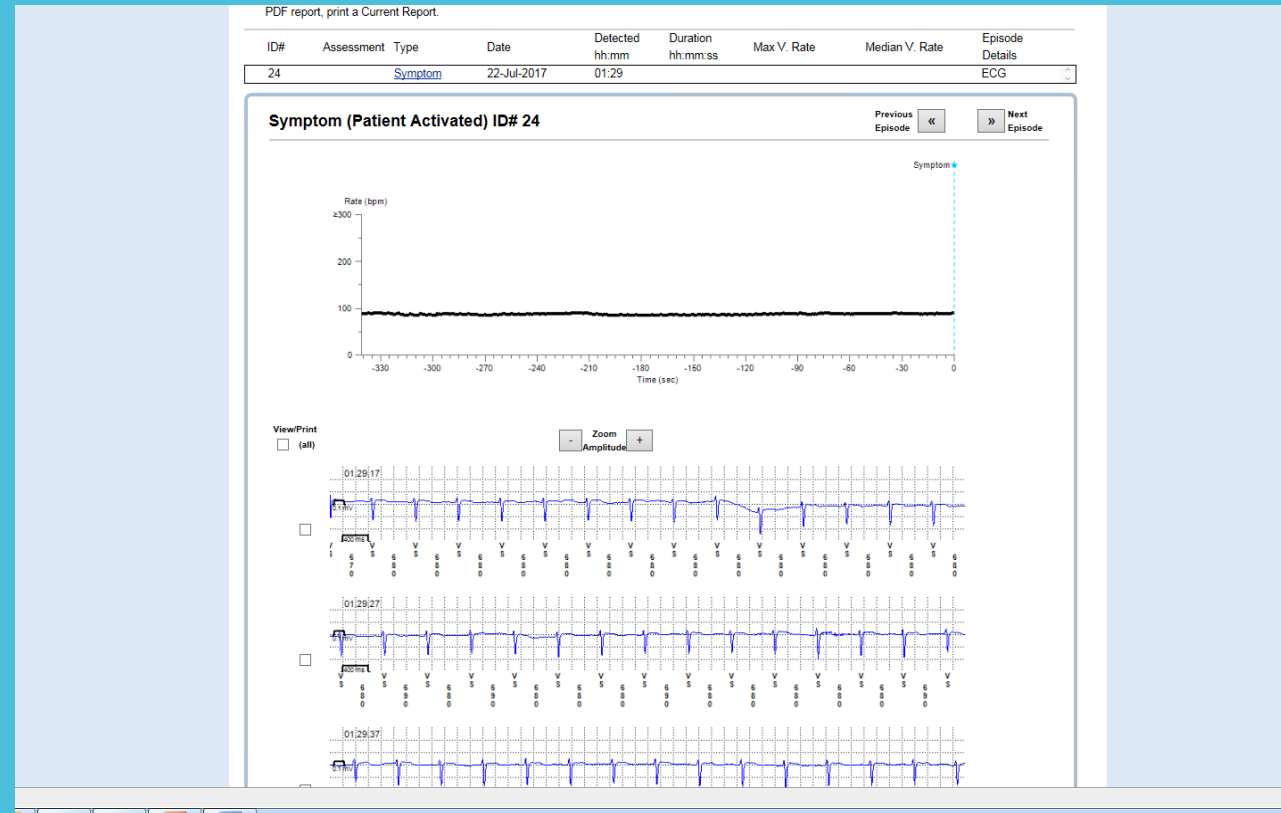


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Casus 6



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Casus 6

- Conclusie?
- Behandeling?
- Toegevoegde waarde homemonitoring?



Vragen???

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