

Onterechte shocks door ICD's

Leendert van den Beukel
Coordinator elektrofysiologie



Onterechte shocks

- ICD therapy voor VT / VF
- Discriminatie algoritme
- 1 of 2 kamersystem
- Voorbeelden
- Programmeermogelijkheden
- Overige oplossingen

ICD therapie voor VT / VF

→ VF

- shock

→ VT discriminatie

- ATP

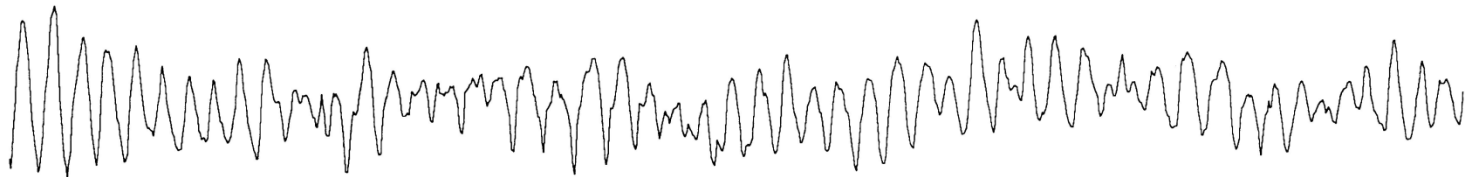
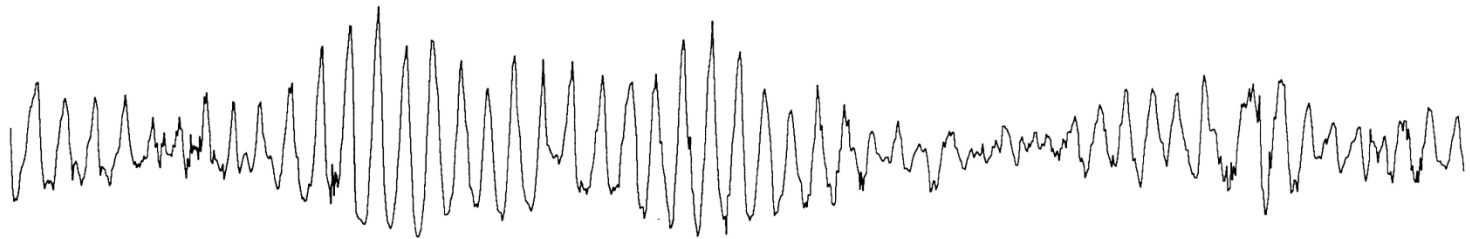
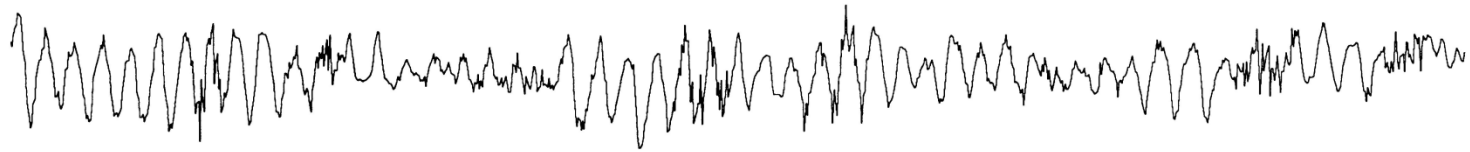
- shock

Ritme

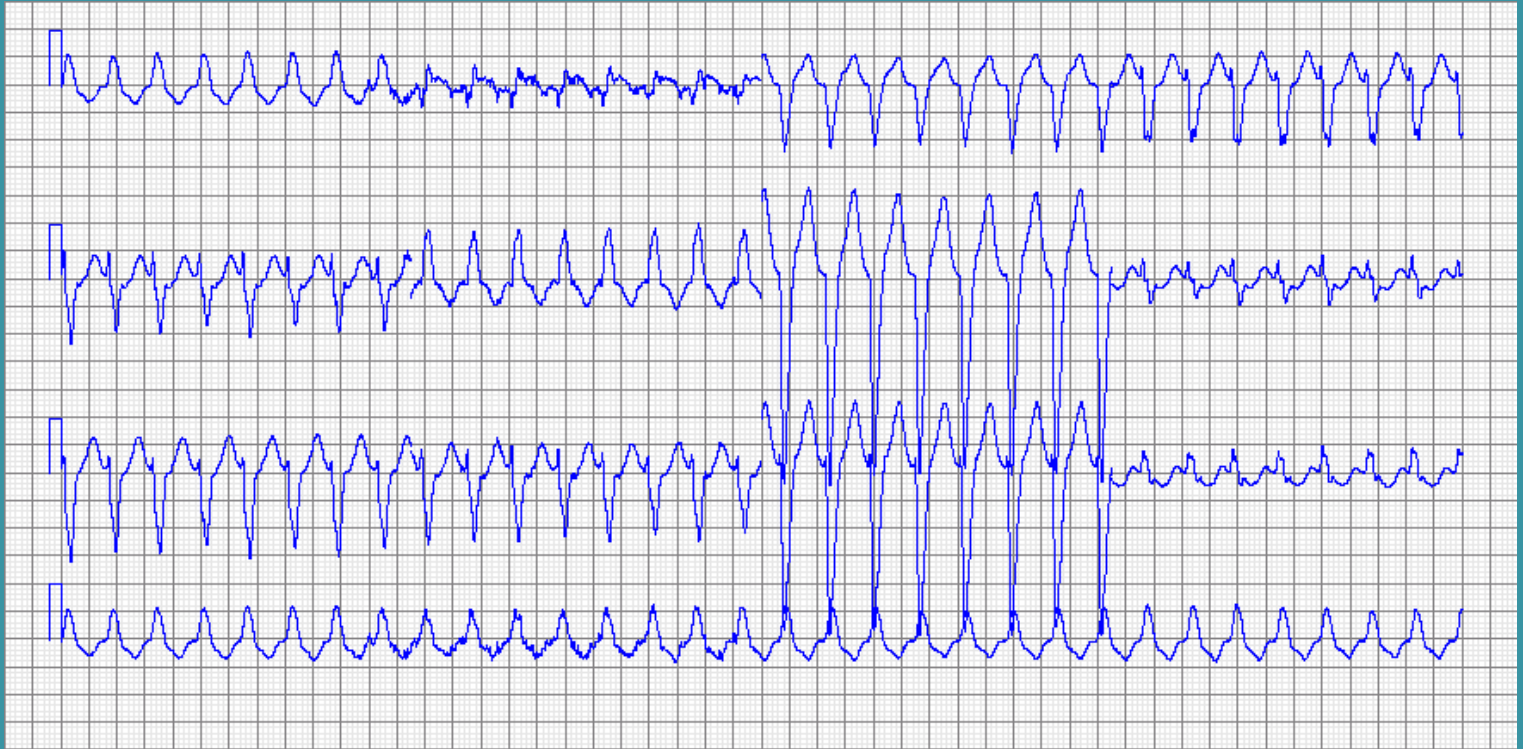
→ Wint een ICD het van u?

Als u ICD was,

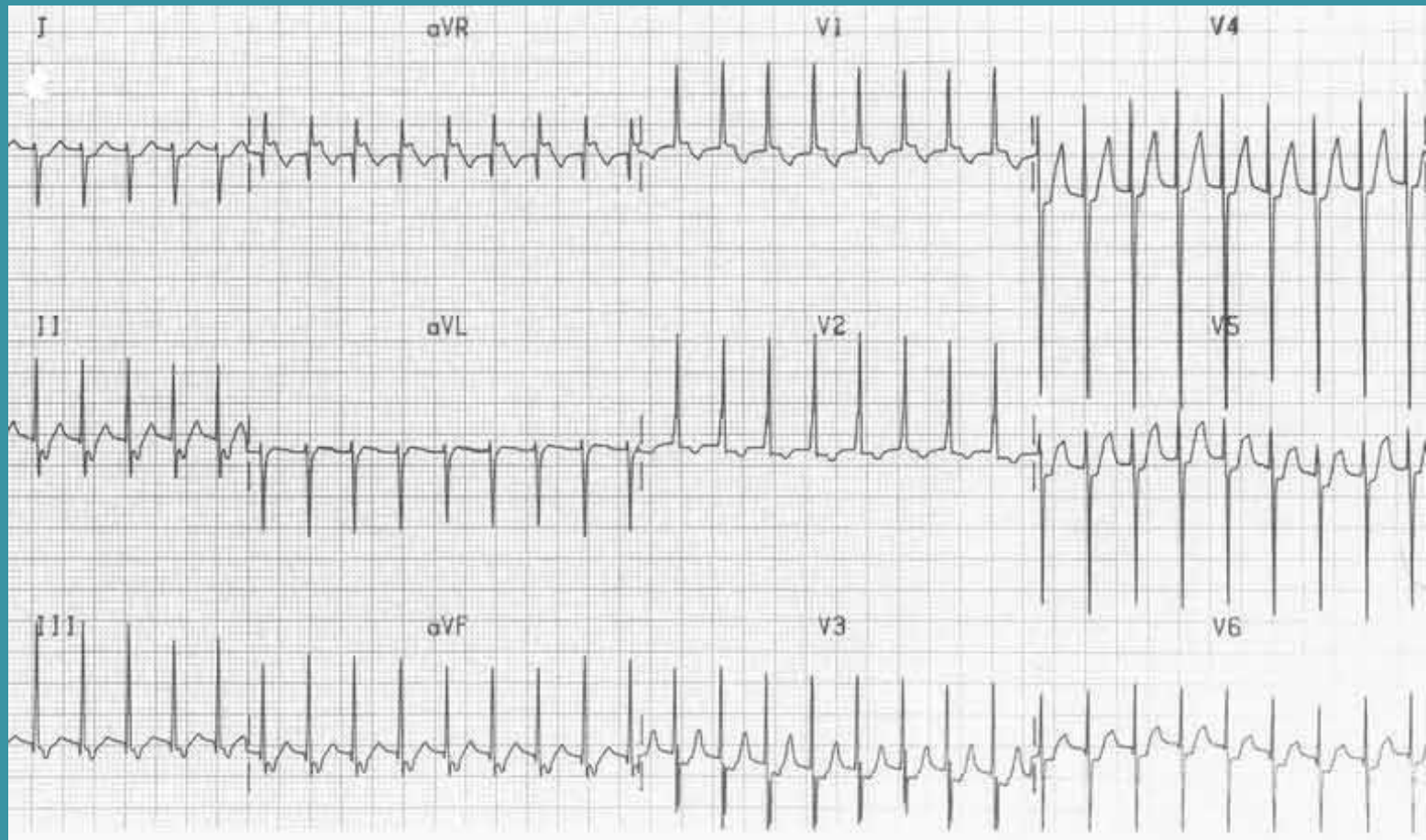
Wat zou u doen?



VT of niet?



VT of niet?



VT - SVT

Hoofdregels

- Sensing
- Frequentie
- Onset
- Stability
- Golfvorm

VT - SVT

Hoofdregels

- Sensing
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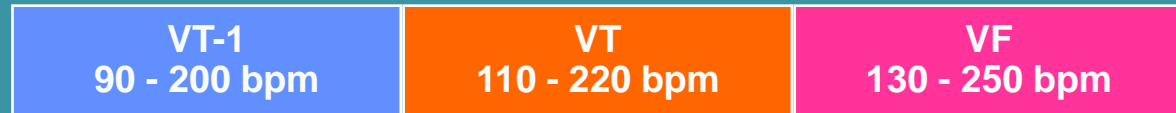


Discriminatoren

Discriminatie algoritme

Programming Ranges

3 Zones



2 Zones



1 Zone



Discriminatie algoritme

→ ONSET (plotse start)

→ STABILITY

→ GOLFOFORM

Discriminatie algoritme

→ **ONSET** (plotse start)

→ **STABILITY**

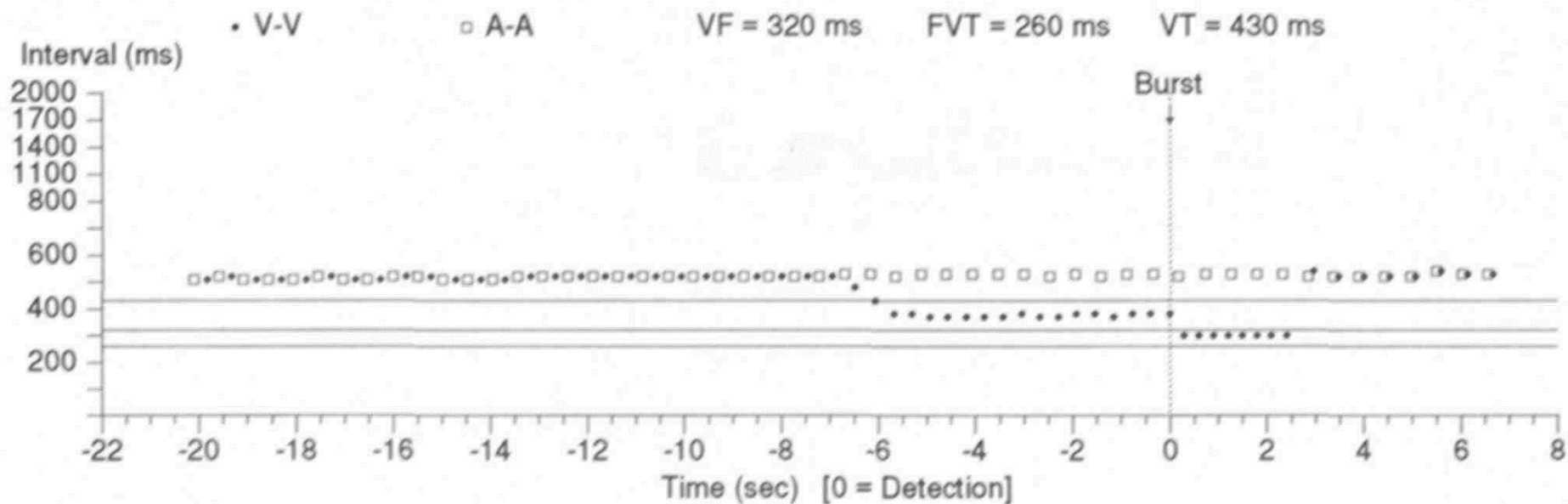
→ **GOLFOVORM**

2 draadssystemen tov 1

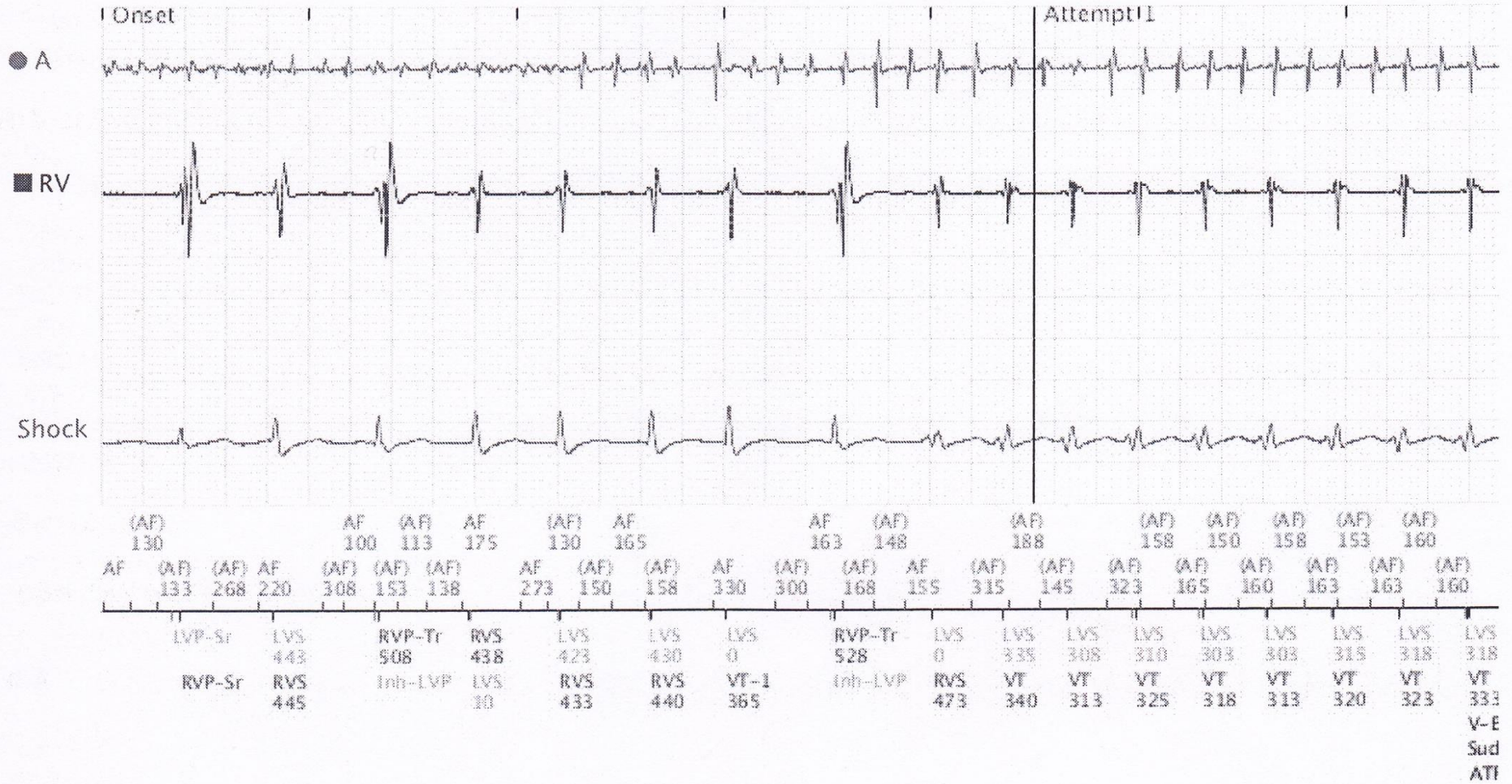
- Atrialedraad geeft extra informatie.
- AF: VT of snel voortgeleid.
- AT: VT of 1:1 of 2:1 voortgeleid.
- Sinusritme.
- **ONSET STABILITY MORPHOLOGIE**

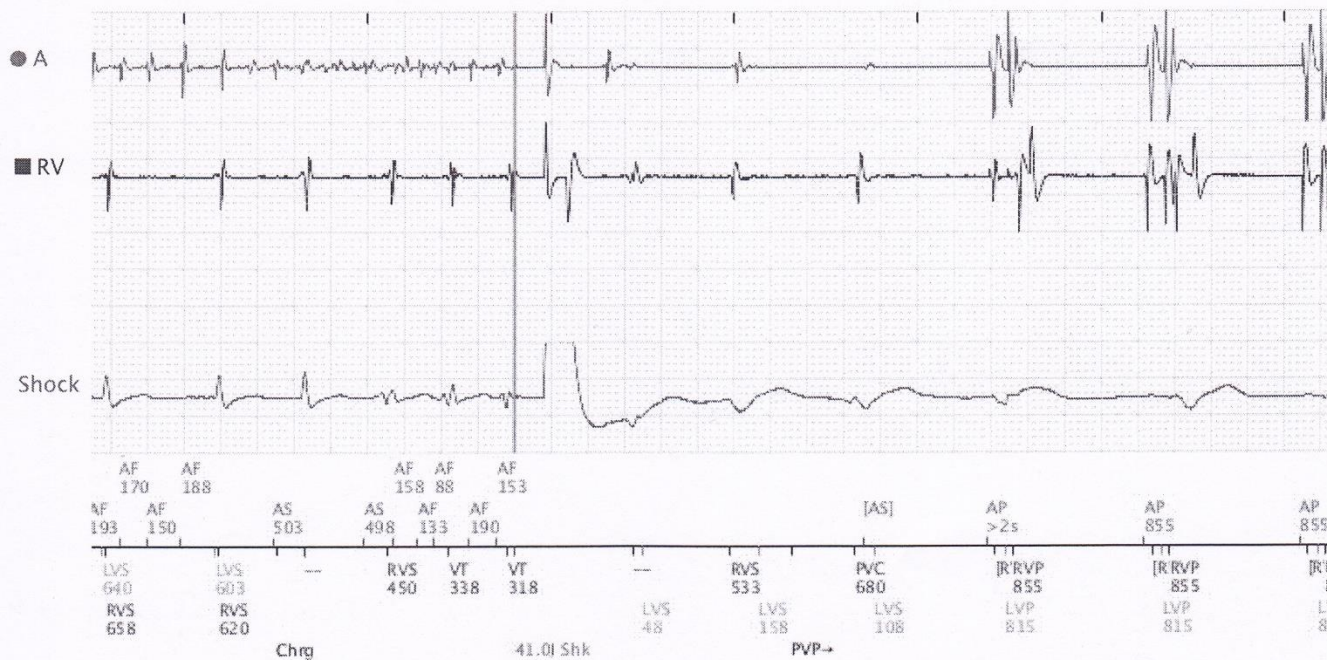
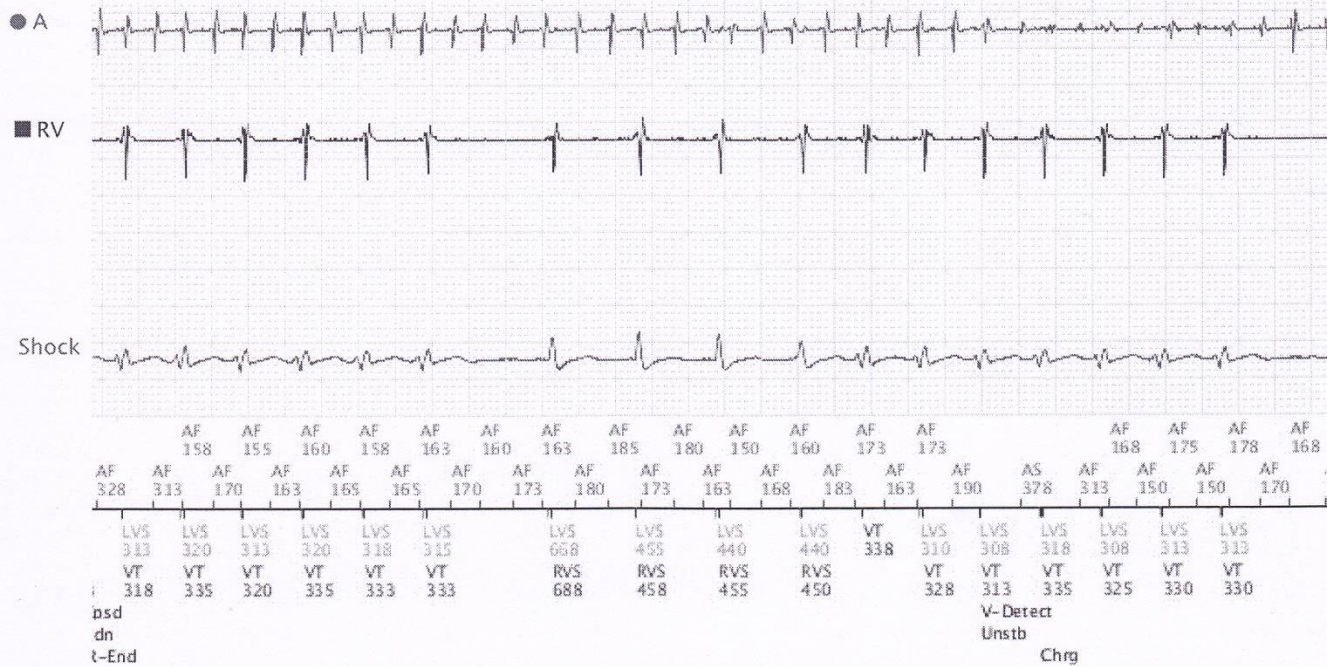
VT - SVT

ID#	Date/Time	Type	V. Cycle	Last Rx	Success	Duration
78	Jan 24 16:09:56	VT	370 ms	VT Rx 1	Yes	8 sec



EGM displayed at 25mm per second





VT - SVT

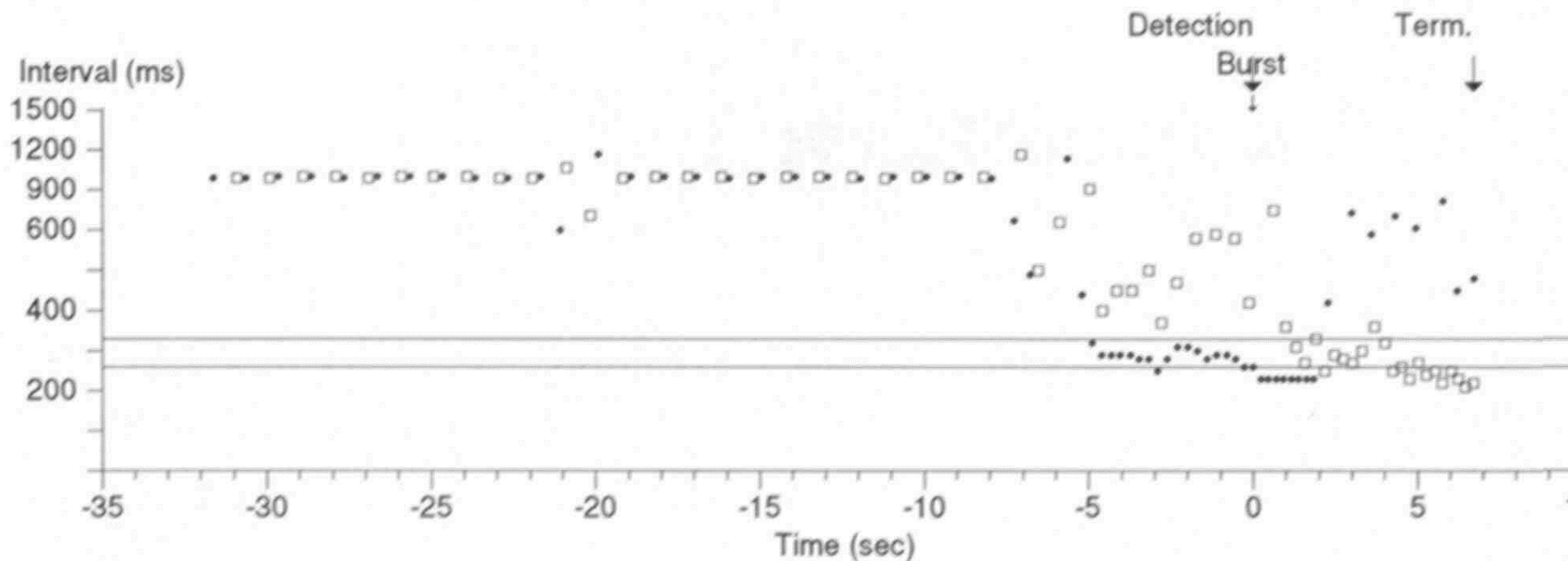
Type	ATP Seq	Shocks	Success	ID#	Date	Time hh:mm	Duration hh:mm:ss	Avg bpm A/V	Max bpm A/V	Activity at Onset
FVT	1	Yes		31	04-Nov-2007	03:40	:06	111/222	231/---	Rest

• V-V

□ A-A

VF = 330 ms

FVT = 260 ms



VT - SVT

Type	ATP Seq	Shocks	Success	ID#	Date	Time hh:mm	Duration hh:mm:ss	Avg bpm A/V	Max bpm A/V	Activity at Onset
VF	1		Yes	25	13-May-2008	13:11	:13	231/231	---/---	Active

• V-V

□ A-A

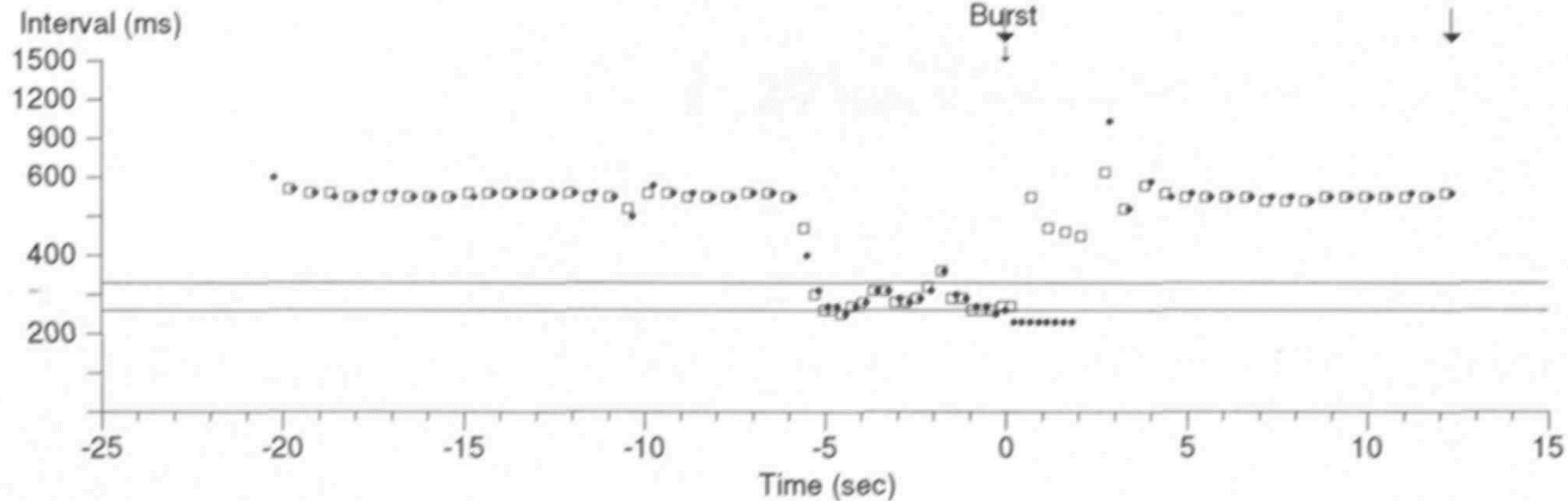
VF = 330 ms

FVT = 260 ms

Detection

Burst

Term.

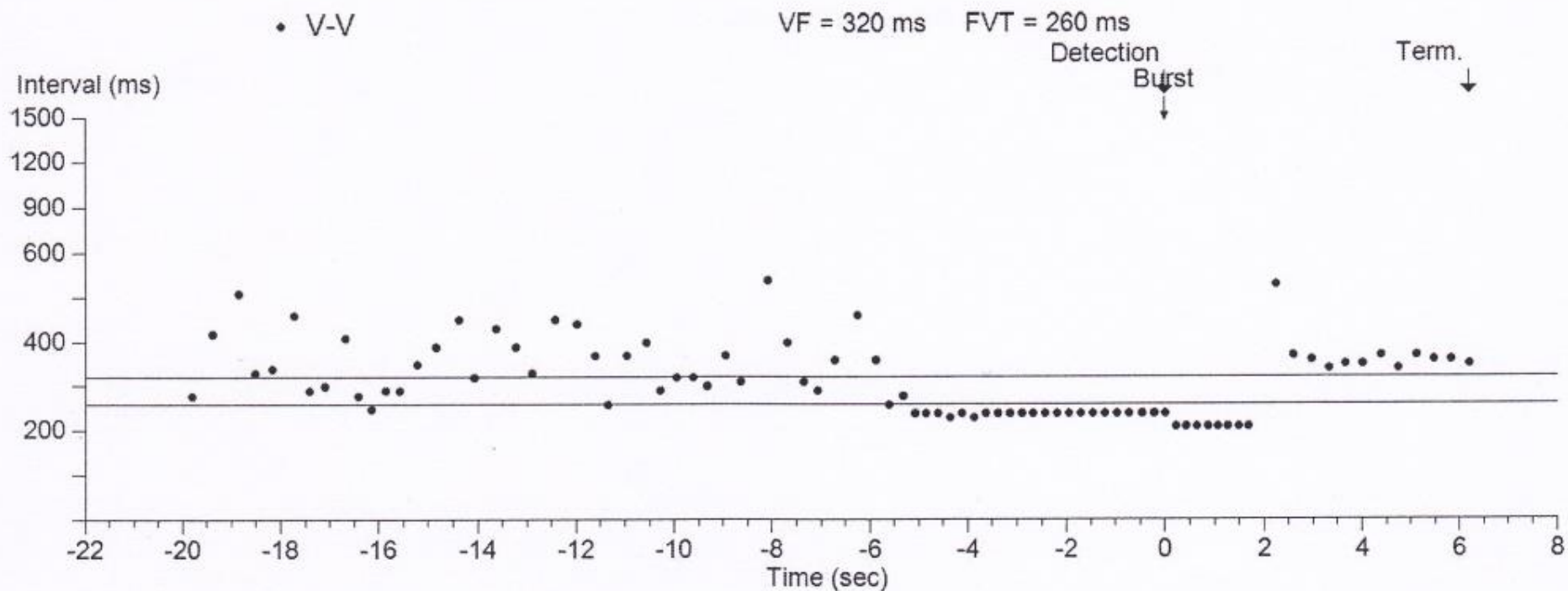


VT - SVT



Onterechte shocks

Type	ATP Seq	Shocks	Success	ID#	Date	Time hh:mm	Duration hh:mm:ss	Avg bpm V	Max bpm V	Activity at Onset
VF	1		Yes	97	30-Jan-2015	06:43	:16:34	250	250	Active



Episode: VT (226 min⁻¹ / 265 ms)

26 Sep 2014 7:25

Duration

00:34 (M:S)

Alerts

SVT discriminators disagree

Detection Criteria

187 - 229 min⁻¹**Therapy**

1) ATP x 2

Results1) Below Rate Detection
(CL 360 ms)

Bigeminal rhythm detected VT diagnosis aborted

ATP Therapy Details

VT ATP Therapy

Successful BCL

248 ms

Therapy 1

Burst 1 224, 224, 224, 224, 224, 224, 224 ms

Burst 2 248, 248, 248, 248, 248, 248, 248 ms

Diagnosis Summary

	Initial Diagnosis	Diagnosis
	SVT	VT
Time to Diagnosis		17,25 sec
Rate (CL)	203 min ⁻¹ (295 ms)	226 min ⁻¹ (265 ms)
Zone	VT	
VT Diagnosis Criteria	2 of 3	2 of 3
Morphology	On, ≥ 60% is a match, ≥ 7 matches indicate SVT	
Min Match Score	87%	80%
Max Non-Match Score	57%	n/a
No. Template Matches	10 of 12 (SVT Indicated)	12 of 12 (SVT Indicated)
Sudden Onset	On, < 20 % indicates SVT	
Max Delta	21 % (VT Indicated)	21 % (VT Indicated)
Interval Stability	On w/SIH, ≥ 50 ms or SIH Count ≥ 2 intervals indicates SVT	
Stability Delta	115 ms (SVT Indicated)	40 ms
SIH Count		0 (VT Indicated)

SVT Criteria Statistics

SVT Diagnoses during this episode 1

Measured SVT Discriminator values through initial VT/VF Diagnosis

Min Match Score	80 %	Min/Max Stability Delta	40 ms /115 ms
Max Non-Match Score	57 %	Min/Max SIH Count	0 / 0
Template Used	11 Jul 2013 7:07	Max Onset Delta	21 %



Amphia

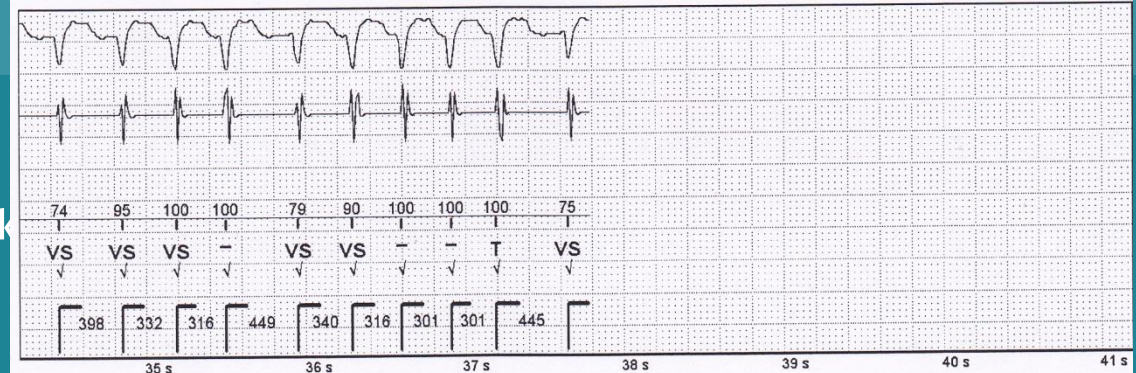
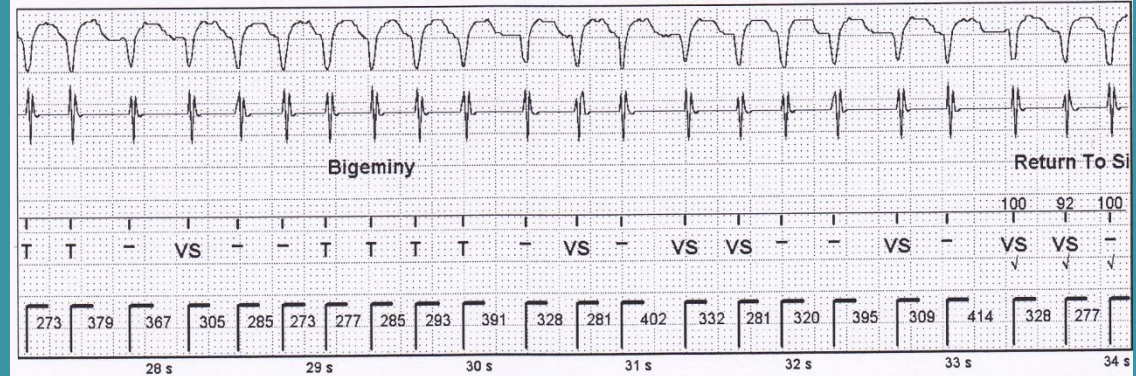
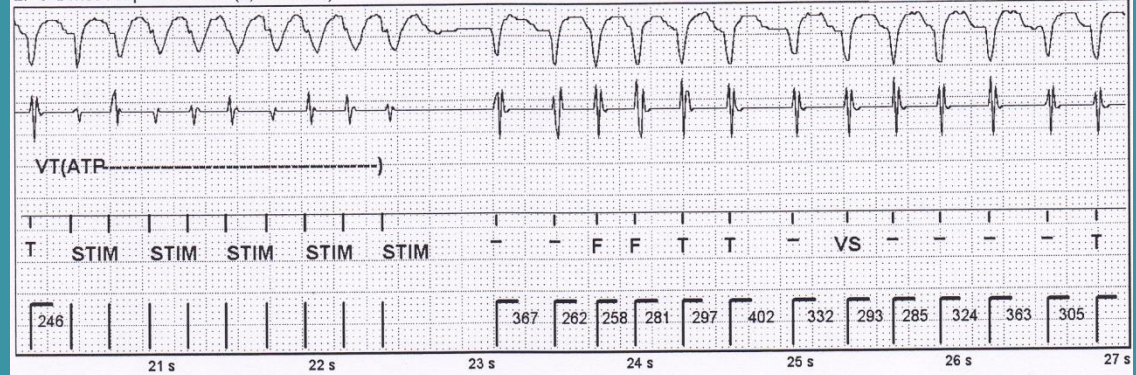
26 Sep 2014 7:25

1: RV-coil-Can AutoGain (0,8 mm/mV)

3: Markers

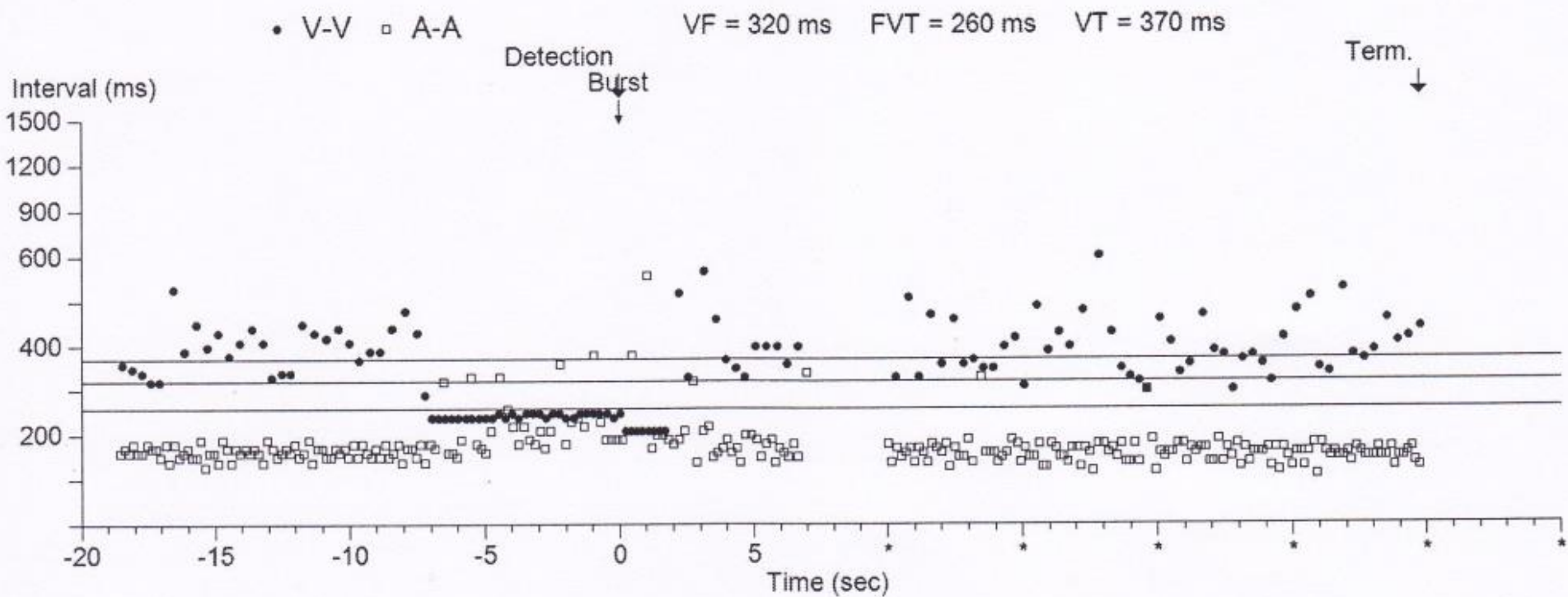
2: V Sense Amp AutoGain (0,4 mm/mV)

Sweep Speed: 25 mm/s



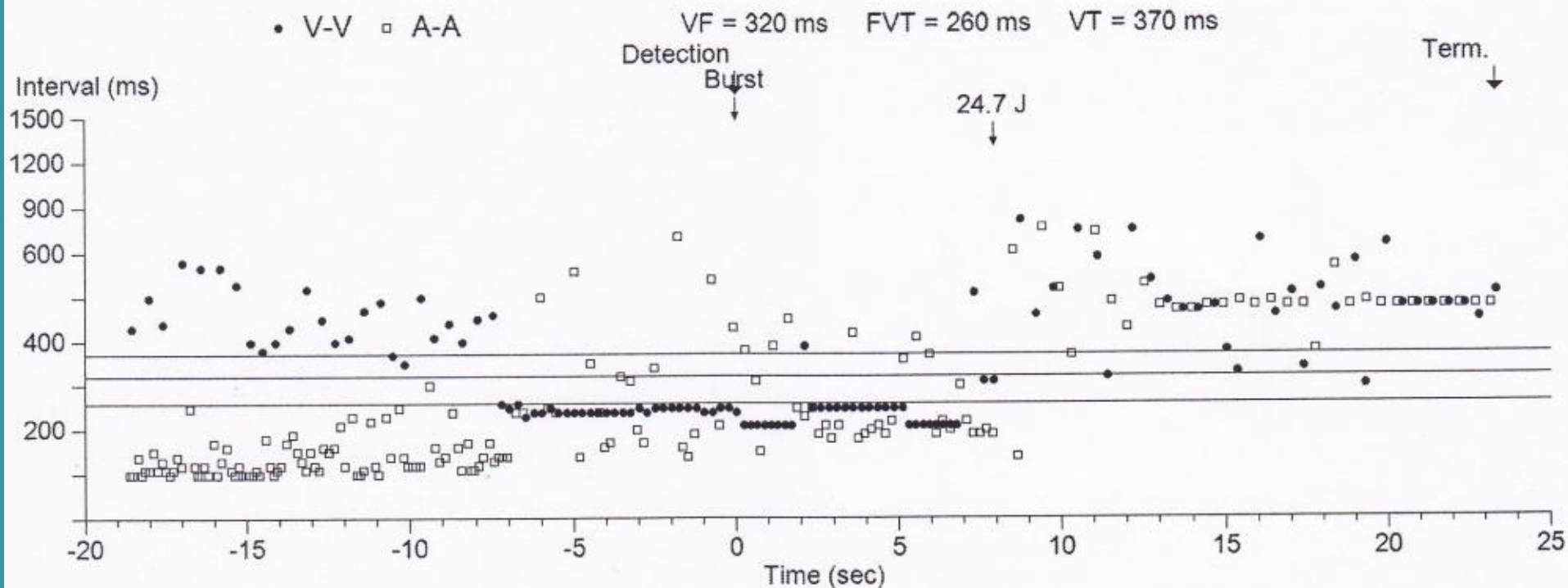
Onterechte shocks

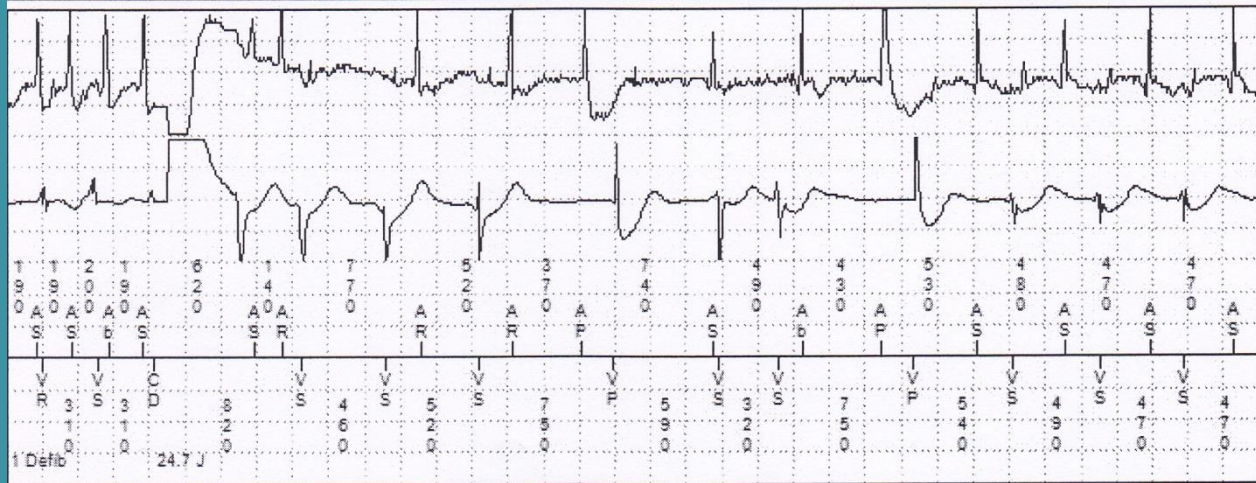
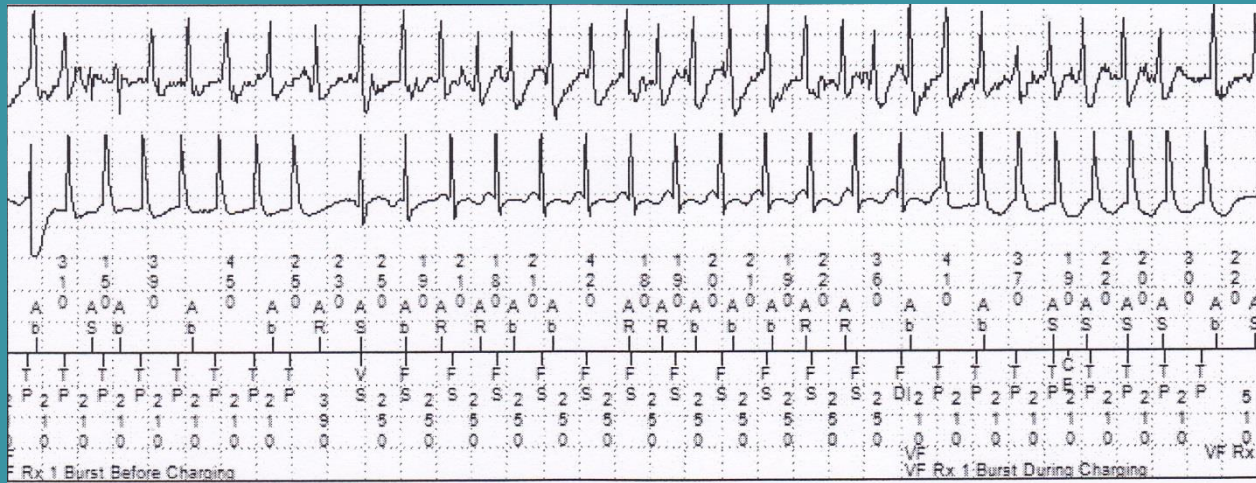
Type	ATP Seq	Shocks	Success	ID#	Date	Time hh:mm	Duration hh:mm:ss	Avg bpm A/V	Max bpm A/V	Activity at Onset
VF	1		Yes	122	10-Sep-2011	05:17	:01:13	300/250	400/---	Active



Onterechte shocks

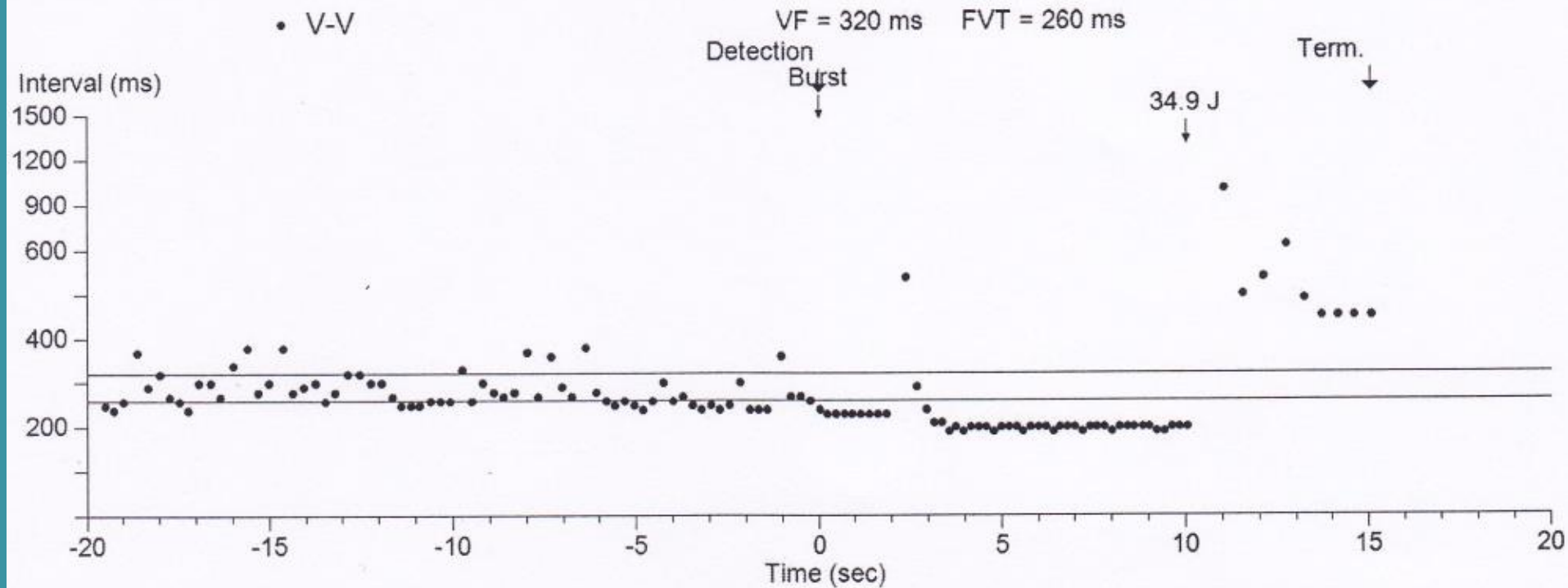
Type	ATP Seq	Shocks	Success	ID#	Date	Time hh:mm	Duration hh:mm:ss	Avg bpm A/V	Max bpm A/V	Activity at Onset
VF	2	25J	Yes	120	10-Sep-2011	05:15	:27	176/250	286/---	Rest





Onterechte shocks

Type	ATP Seq	Shocks	Success	ID#	Date	Time hh:mm	Duration hh:mm:ss	Avg bpm V	Max bpm V	Activity at Onset
VF	1	35J	Yes	7	06-Apr-2014	09:55	:12	231	240	Active



EGM1: RVtip to RVring

(1 mV)

EGM2: Can to RVcoil

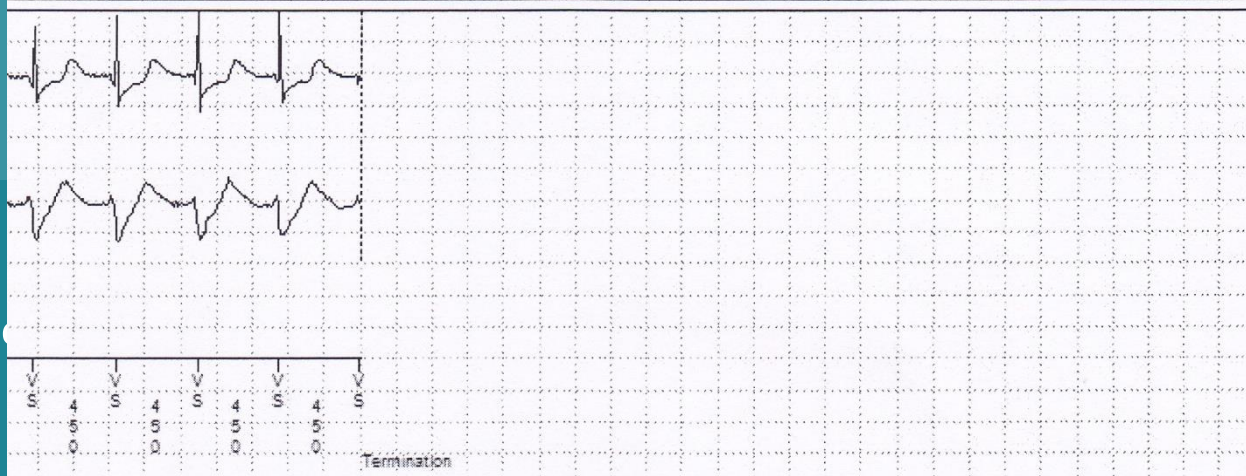
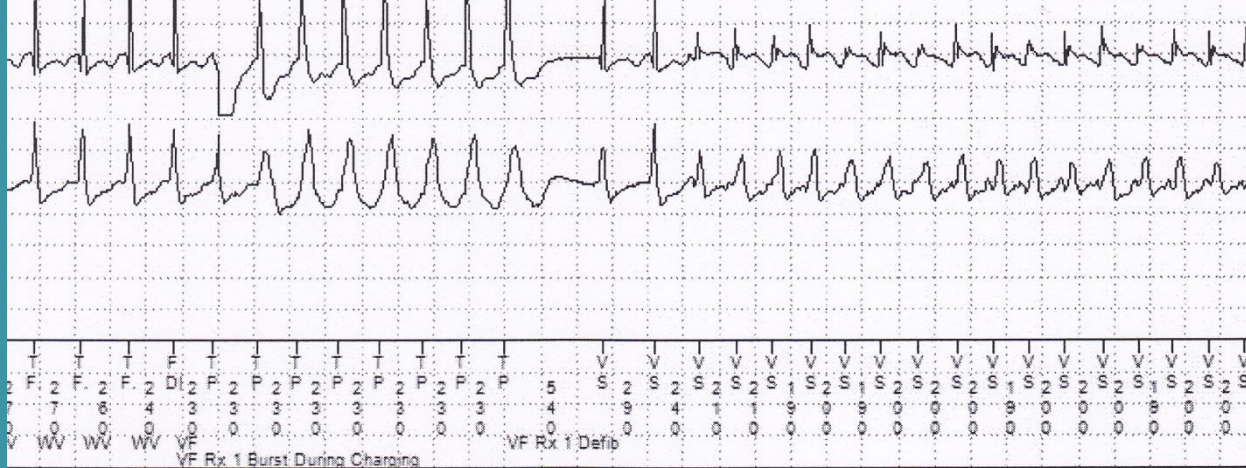
(1 mV)

Markers

V-V Interval (ms)

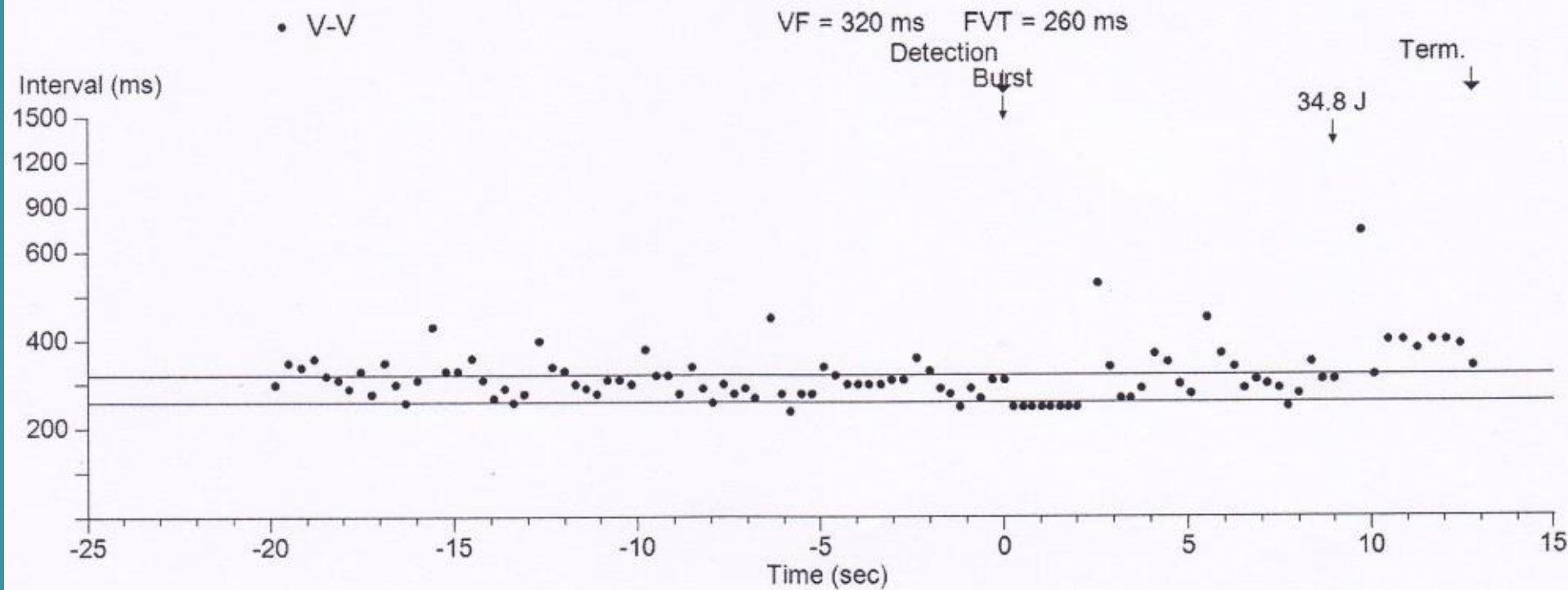
F	F	T	V	T	V	T	T	F	T	T	T	V	V	T	T
2	5	2	3	2	2	2	2	3	2	3	3	3	3	2	3
5	4	6	7	9	2	7	6	4	0	0	0	0	0	7	4
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

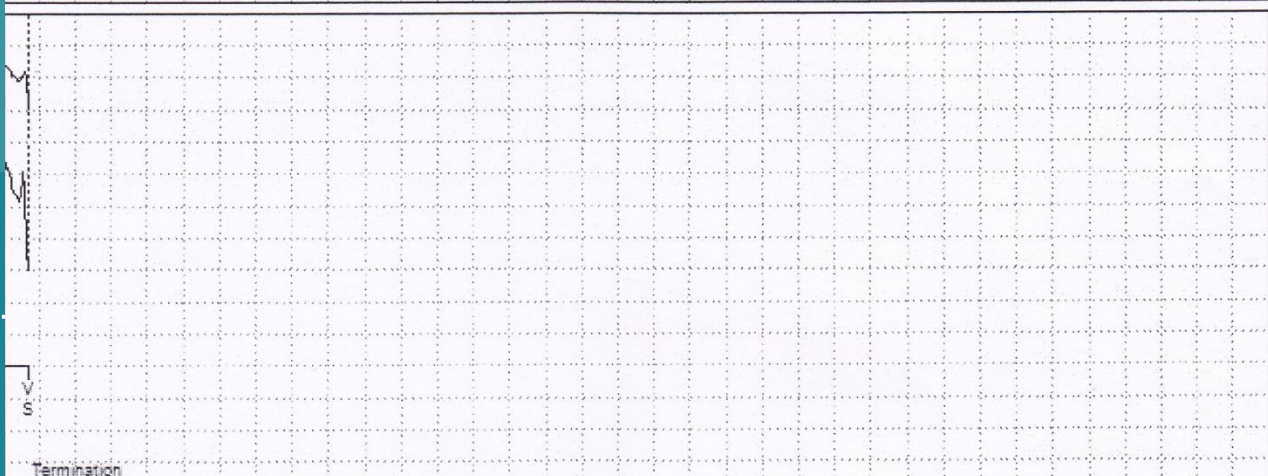
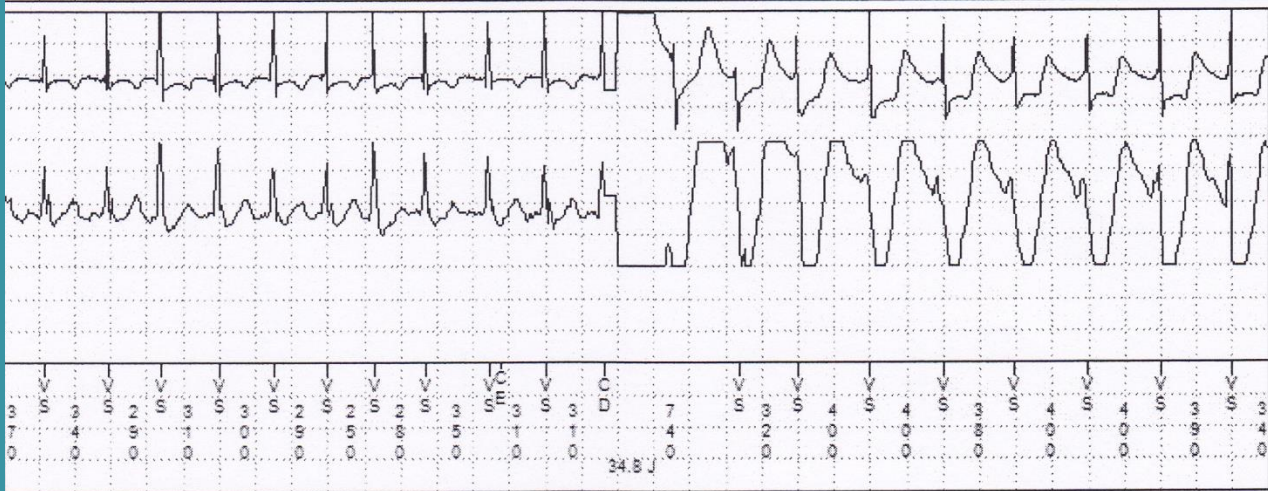
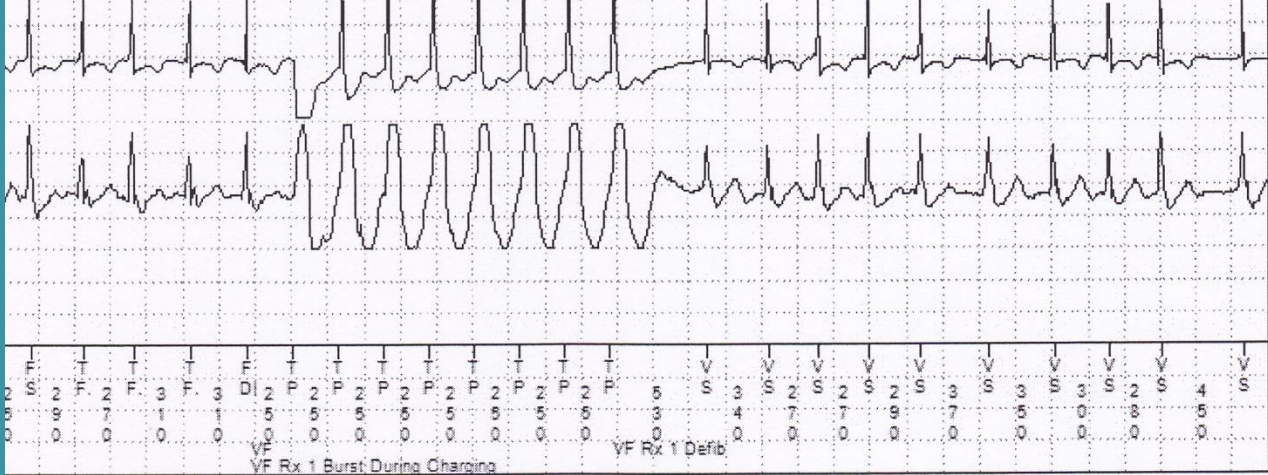




Onterechte shocks

Type	ATP Seq	Shocks	Success	ID#	Date	Time hh:mm	Duration hh:mm:ss	Avg bpm V	Max bpm V	Activity at Onset
VF	1	35J	Yes	80	02-Apr-2011	08:44	:09:43	207	---	Active





Onterechte shocks door AF

Aanpak:

- Hoge VF zone
- Discriminatoren optimaliseren
 - Langere detectietijden!
 - Morphologie!
 - Onset?
 - Stability?

Onterechte shocks door AF

Aanpak:

- Medicatie aanpassen
- PVI / Mini Maze
- His ablatie