Holter How to Interpret my Interpretation

Dr Amir Janmohamed Director Arrhythmia Services Scarborough and Rouge Hospital

Components

- Indications
- History
- Medications
- Symptom diary
- Resting ECG



Components of the Report

- Demographics
- Summary of data
- Interpretation and Impression
- Tabular summary
- Graphical summary of heart rates, APBs, VPBs and VT by hour.
- Full sized strips.

Demogaphics

Date of Birth:	1954-08-01	Scan Number:	
ID:	1258	Date Recorded:	2010-12-20 🐵 8:45
Age:	C2 Years	Date Processed:	2017-01-07
Sex:	M	Recorder Num:	021085
A natyst:		HookupTech:	VANITHA
Physician:	DR. JANMOHAMED / I. GOLD STE	IN .	
Indications:	Palpitations	Medications:	BAMIPBIL
	•		ROSUVASTATIN





Summary Data

The patient was monitored for a total of 2359 hours. The total time analyzed was 2352 hours. Start time was 8:45 am 1. There was a total of 119262 beats. There were 0 Ventrioular beats, less than 1% were Supraventrioular beats, and patientis rotpaced.

```
Mean Heart Pate: 83
Maximum Heart Pate:145 @ 8.5.1 am 1
Minimum Heart Pate : 59 @ 2:13am2
            Pauses: 0 (> 25 seo.)
  Supraventrioular Eotopy
         Total 2
         Single: 0
         Pais: 1
     Total Burger 0.
                                     Ventrioular - Not Present
  Beats in Bure: 0
   Longest Run: 0 @ 8:45am1(0 BPM)
   Fastest Run: 0 @ 8:45a m1(0 BPM)
      Aberrant: 0
RR Variability
                             ST Abcolute
     SDNN: 102.52 mg
                             Depression mm
    pNN50: 1.358 %
                               Elevention: mm
    RMSSD: 17.210 ms
     SDSD: 17.210 mg
                               Hospital
```

Interpretation and Impression

COMMENTS:

Normal sinus rhythm with a normal rate range. Rare atrial and no ventricular ectopy with no runs seen. No pauses noted, no symptoms reported.

Impression: Normal study.

Physioian's Signature:	Dr Amir Janmohamed	Jan 20, 2017





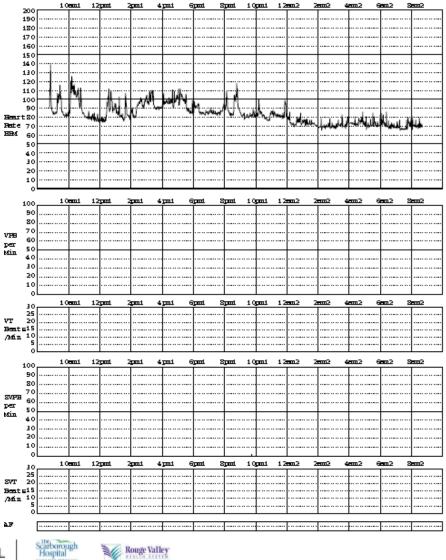
Tabular Summary

GENERAL PROFILE

Intervai	Hen	rt Fe t	c	Totai	VPB	VPB	Rans	svpe	svpb	Fm s		Time
Starting	Lo	12an	E	Beats	Totai	Fairs	: VT	Totai	Pairs	SVT	Pances	Anniyzei
8:45mml	81	100	14 5	1346	0	0	0	C) ()	0	0	0:13
9:00 mml	73	89	127	5263	0	0	O	Ę) ()	0	0	0:58
10:00 mml	69	101	138	5963	0	0	0	C) ()	0	0	0:58
11:00-aml	66	80	102	4 802	0	0	0	C) ()	0	0	1:00
12:00pml	67	87	125	5170	0	0	Ō	Ľ) ()	0	0	0:59
1:00	70	24	112	5 0 5 9	0	0	0	C) ()	0	0	0:59
2:00pml	73	51	109	5512	0	0	0	C) ()	0	0	0:59
3:00pml	81	96	171	5768	0	0	o	ſ) ()	0	0	0:59
4:00pml	25	98	120	5830	0	0	Ō	Ľ) ()	0	0	0:59
5:001	78	55	121	5707	0	0	0	C) ()	0	0	0:59
6:00pml	77	87	105	5 2 74	0	0	0	C) ()	0	0	0:59
7:00	71	86	111	5187	0	0	O	C) ()	0	0	0:59
8:00pml	74	92	127	5505	0	0	0	C) ()	0	0	0:59
9:00pml	72	81	109	4 9 5 4	0	0	o	2	1	0	0	1:00
10:001	71	82	113	4951	0	0	0	C) ()	0	0	0:59
11:00pml	72	24	108	5 043	0	0	0	C) ()	0	0	1:00
12:00 m 2	62	75	104	4509	0	0	o	ſ) ()	0	0	0:59
1:00 mm 2	64	73	93	44.05	0	0	0	C) ()	0	0	0:59
2:00mm2	59	70	111	4217	0	0	0	C) ()	0	0	1:00
3:00 mm 2	62	71	111	4317	0	0	Ō	ſ	0	0	0	0:59
4:00mm2	60	74	121	44 53	0	0	0	C) ()	0	0	0:59
5:00mm2	60	72	114	4342	0	0	0	C) ()	0	0	1:00
6:00 m 2	60	71	111	4317	0	0	0	C) ()	0	0	0:59
7:00 2	59	69	116	4159	Ō	0	0	C) ()	0	0	0:59
8:00 m 2	63	71	116	31 🕀	0	0	0	C) ()	0	0	0:44
Summary:	59	83	14 5	119262	0	0	0	7	: 1	0	0	23:52

Graphical Summary

HEART RATE TREND (24 hours)



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Course in case of the local division of the

ECG Strips

FULL-SIZED STRIPS

Gain 10 cm/ms BCG 25 mm tec (ALL)

R4009am-1

Test begin

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Indications

- Clarity in the indication permits the most accurate and useful results.
- Specific details of the history can help clarify details of the indication and assist in the analysis and drawing of conclusions.

Case 1

Date of Birth	8/16/1931	Sean Nomber:	DR. E. B. KER
ID #	694-15	Date Recorded:	10/13/2016
Age	85 Years	Date Processed	10/15/2015
Ser	F	Recorder Num:	009693
		HookupTech	SUEA
Indications	PALFITATIONS	Médications:	ERTAFIERATE
			TERATOSIN
			THLMESARTAN



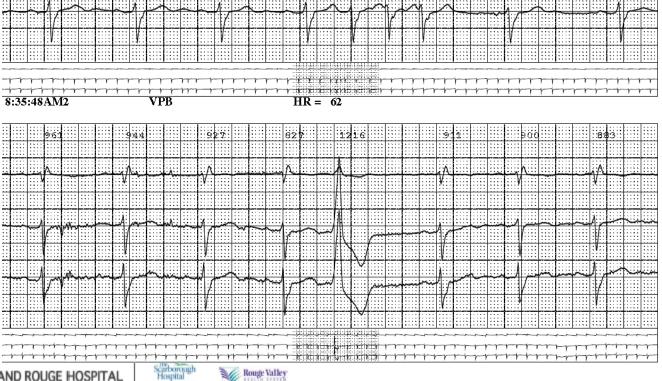
was 46:44 hours. Start time was 1:07PM1. There were a total of 188030 Beats. Less than 1% were Ventricular beats, (9.48%) were Supraventricular beats, and less than 1% were Paced beats.

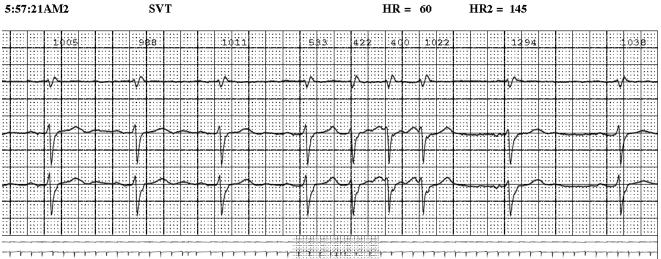
Mean Heart Rate: 67 Maximum Heart Rate: 94 at 10:15:46AM2 Minimum Heart Rate: 48 at 12:15:00AM3 Pauses: 0 (Greater than 3.0 sec.) Ventricular Ectopy Supraventricular Ectopy Total: 244 Total: 17840 Single: 233 Single: 16996 Pairs: 2 Pairs: 307 Total Runs: Total Runs: 1 44 Beats in Runs: Beats in Runs: 230 4 # # beats Grate beats Grate Longest Run: 4 @ 2:04AM3 163 Longest Run: 40 G 6:33AM3 118 4 @ 2:04AM3 163 Fastest Run: Fastest Run: 9 G 7:49PM2 183 3 RonT: Aberrant: 0 _____ RR Variability ST Absolute SDNN: 115 ms Depression pNN50: 2.78 % Elevation : RMSSD: 33 ms



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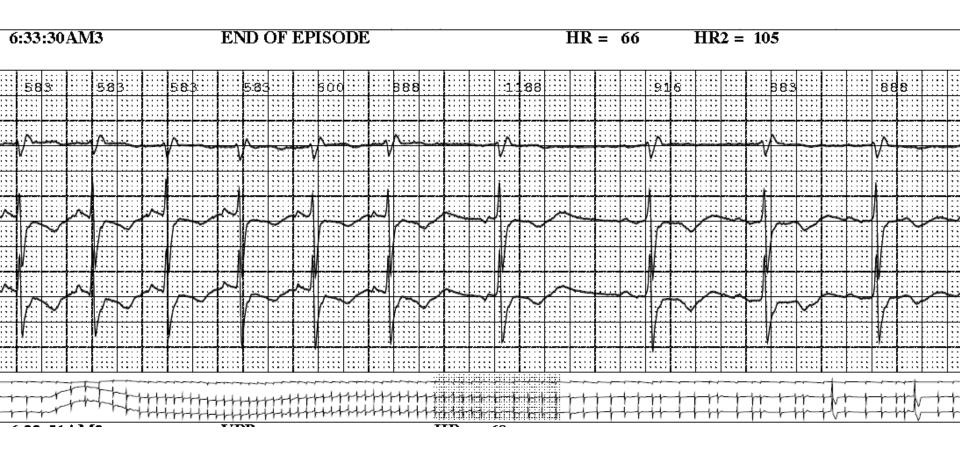






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Report

- Normal sinus rhythm with RBBB, left anterior hemiblock and first degree AV block (trifascicular block equivalent). Rare ventricular ectopy of an RVOT origin with one 4beat run seen. Very frequent atrial ectopy with multiple short runs seen. No pauses noted. ST segment changes seen at peak heart rates. No symptoms reported.
- Impression: Sinus rhythm with RBBB, left anterior hemiblock and first degree AV block, but no significant pauses noted. Consider further assessment of ST segment changes.

Case 2

Date of Birth:	09 15 1961	Scan Nomber:	
ID 株	501	Date Recorded:	09 30 2015
Age:	55 Years	Date Processed	10 15 2016
Ser	м	Recorder Num:	020921
Analyst		HookspTech	SUBA
Interp. Physician:		Height	o Weight o BMC o
Indications:	DI ZZINE SS	Medications:	CRE STOR
	PALFITATION		A24



Rouge Valley

NAGUI, ARSHIL was monitored for a total of 313:38 hours. The total time analyzed was 251:49 hours. Start time was 9:05 AM1. There were a total of 1063010 beats. Less than 1% were Ventroular beats, less than 1% were Supraventrioular beats, and there were 0 Paced beats.

```
Mean Heart Pate: 70
Maximum Heart Pate: 161 at 9:13 5 3A 10
Minimum Heart Pate: 40 at 1:06 5 4A M3
Pauses: 0 (Greater than 3.0 sec.)
```

Ventrioutar Eotopy		Supraventriouta	r Eotopy20%
Total: 30)48	Total: 2	109
Single: 30)38	Single: 2	109
Pairs:	3	Pais:	
Total Runa:	1	Total Runs:	
Beats in Runs:	4	Beats in Runs:	
#beats	e rate	#beats	e rate
Lorgest Run	4 @ 6 5 5 A M5 175	LorgestRun	@10:48P11
Fastest Run	4 @ 6 5 5 A M5 175	Fastest Run	@10:48P11
RonT:0		Aberrant:	0



Time		Totai	Time	Brady	Time in	Tachy	Time in	
Begin	ling	Bete	Anniyzed	Pete	Bradycardia	Beats	Thetrycardia	
9:05:0	ana.	0	0:00:00	0	0: 00: 00	0	0: 00: 00	
11:59:5		ō	0:00:00	ō	0:00:00	ō	0:00:00	
9:05:0	19.30	3234	0:47:56	0	0: 00: 00	139	0:01:19	
10:00:0		3624	0:59:53	0	0: 00: 00	0	0: 00: 00	
11:00:0		4007	0:58:58	1	0:00:01	0	0:00:00	
12:00:0		4269	0:54:17	0	0:00:00	50	0:00:28	
1:00:0		4075	0:51:35	0	0:00:00	69	0:00:39	
2:00:0 3:00:0		2375 3418	0:27:16 0:38:08	0	0: 00: 00 0: 00: 00	168 223	0:01:35 0:02:07	
4:00:0		22 01	0:23:15	ŏ	0:00:00	519	0:04:47	
5:00:0		12 64	0:12:40	ŏ	0:00:00	623	0:05:54	
6 : 00: 0	OF14	3326	0:41:12	0	0: 00: 00	276	0:02:36	
7:00:0	OF141	3959	0:50:45	0	0: 00: 00	43	0: 00: 25	
2: 00: 0		4609	0:59:37	0	0: 00: 00	0	0: 00: 00	
9 : 00: 0		4576	0:59:57	0	0:00:00	0	0: 00: 00	
10:00:0		4385	0:58:00	0	0:00:00	0	0:00:00	
11:00:0		3887	0:59:14	0	0:00:00	0	0:00:00	
12:00:0		384.2 395.0	0:58:51 0:59:14	0	0: 00: 00 0: 00: 00	0	0: 00: 00 0: 00: 00	
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7:00:0		33 05	0:59:59	2 39	0:05:56	0	0:00:00	
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9:00:0		3435	0:56:16	28	0:00:33	8	0:00:04	
10:00:0		3690 3834	0:58:17 0:58:19	0	0: 00: 00 0: 00: 00	0	0: 00: 00 0: 00: 00	
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2:00:0		3834	0:55:22	ō	0: 00: 00	60	0: 00: 37	
3:00:0	CF12	4080	0:59:45	0	0: 00: 00	0	0: 00: 00	
4:00:0	CF12	35 34	0:58:18	12	0: 00: 14	0	0: 00: 00	
5:00:0	CF12	334.0	0:59:57	119	0:02:25	0	0: 00: 00	
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7:00:0		3798	0:59:33	0	0:00:00	0	0:00:00	
2:00:0 9:00:0		4046	0:58:46	0	0:00:00	0	0: 00: 00 0: 00: 00	
10:00:0		4039 3667	0:59:34 0:59:59	12	0: 00: 00 0: 00: 14	0	0:00:00	
11:00:0		3593	0:58:24		0:00:10	ŏ	0:00:00	
12:00:0		3151	0:59:08	5 34	0:11:00	0	0:00:00	
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4:00:0		32 63	0:59:06	3 32	0:06:50	0	0:00:00	
5:00:0		3087	0:58:46	793	0:16:24	0	0:00:00	
6 : 00: 0 7: 00: 0		3954 4270	0:59:11 0:57:02	30 0	0: 00: 3 6 0: 00: 00	0 425	0: 00: 00 0: 03: 57	
2:00:0		44 65	0:37:28	ŏ	0:00:00	4069	0: 32: 57	
9:00:0		2731	0:28:55	ŏ	0:00:00	1177	0:10:45	
10:00:0		31 2 2	0:33:34	ŏ	0: 00: 00	734	0:07:05	
11:00:0	GA16	514.9	0:58:45	0	0: 00: 00	213	0: 02: 01	
12:00:0		44.59	0:54:15	0	0: 00: 00	254	0:02:26	
1:00:0		4622	0:59:06	0	0:00:00	0	0:00:00	
2:00:0		4988	0:59:30	0	0:00:00	3	0:00:01	
3:00:0		4134	0:52:04	0	0:00:00	5	0:00:02	
4:00:0		3900 4283	0:52:52 0:58:02	0	0: 00: 00 0: 00: 00	0 35	0: 00: 00 0: 00: 20	
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Results

- Normal sinus rhythm with a blunted rate range. Frequent PVOT PVCs and occasional atrial ectopy with no significant runs seen. No pauses noted, no sustained arrhythmias seen. Ambulatory ST-T changes noted.
- Impression: Normal study. Consider ischemia testing.

Case 3

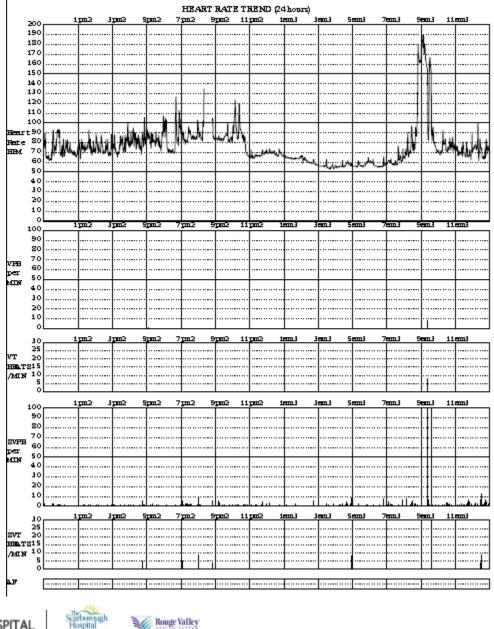
Date of Birth ID # Age	11/6/1970 1391-26 46 Years	Sean Number: Date Recorded: Date Frocessed	DR C. NEWMAN 1/16/2017 1/25/2017
Seit	B	Recorder Num: HookupTech:	016225 INCRID
Indications	A. FIERILATION	Médications:	METOPROLOL Synthroid TECTA



was 60:22 hours. Shart time was 11:00MM1. There were a total of 270023 Beats. Less than 18 were Ventricular beats, (3.178) were Sapraventricular beats, and less than 18 were Paced beats.

Mean Heart Rate: 75 Maximum Heart Rate: 140 at 6:42:55PM2 Minimum Heart Rate: 50 at 5:45:112M2 Pance ce 0 (Greater than 3.0 pec.) Ventricular Hetopy Supreventricular Betopy Total: 10 Totai: 8577 Single: Single : 2 930 Pairs: Pairs: 0 133 Total Rans: Total Runs: 1 36 Beats in Rans: Ξ Bents in Runs: 7381 bents Prate **±** tents Grate 1 8 C 9:232M9 132 Longest Rnn: Longest Run: 5983 @ 2:484M3 200 Facted Rm: 5983 @ 8:430363 8 @ 9:244MG 132 Restert Rnn: 200 **FORT**: ñ – Aterrent: ñ. HR Variability ST Absointe SINN: 131 mg Depression : 1.0 nm pNNS0: 1.22 8 **Bievation** = RMEED: 25 ms







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Report

- Normal sinus rhythm with a normal rate range. Rare ventricular ectopy with no runs seen. Frequent atrial ectopy with multiple runs of SVT, likely AVNRT, seen. No pauses noted. Symptoms were reported with SVT.
- **Impression**: Normal study with symptomatic SVT, AVNRT. Consider EP Study and ablation.

Case 4

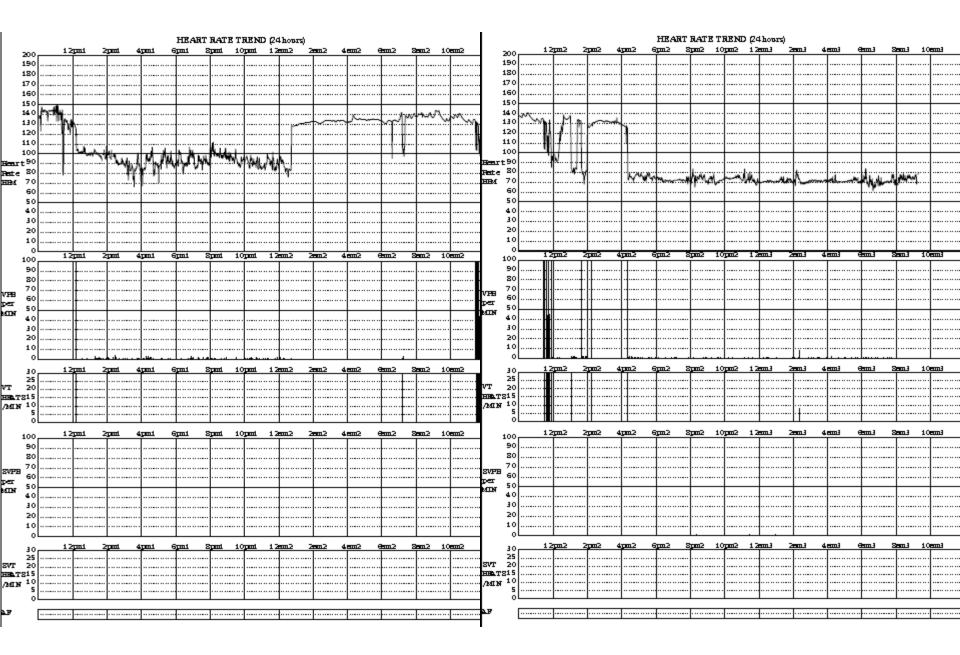


Rouge Valley

was 44:21 hours. Shart time was 10:03AM1. There were a total of 268036 Beats. (49.28) were Ventricular beats, less than 18 were Supreventricular beats, and less than 18 were Paced beats.

Mean Heart Rate:	101		
Maximum Heart Rate	: 147 mt 10:56:224	an .	
Minimum Beart Rate	: 58 et 8:16:48P	10	
Pauses:	0 (Greater t	tan 3.0 sec.)	
Ventricular Hetopy		Supraventr icu iar	Betopy
Total:	131984	Total:	3
Single:	27.6	Single :	3
Paire:	0	Pairs:	0
Total Rans:	18	Total Runs:	0
Beats in Rons:	131708	Bents in Runs:	0
+	bents Prate	+	tests Prate
Longest Run:	4 695 3 6 12:444342	148 Longest Fnn:	0 e 10:0 32341 0
Pastest Rm:	17804 C 10:03436	152 Fastest Fan:	0 e 10:0 32311 0
Forf:	0	Aberrent:	0
HR Warint:	iiity	ST Aisointe	
SIND:	105 ms	Degression :	
DNN5 0:	6.51 0	Bievation :	
FREED :	46 ms		







10:03:1**BAM**1

TEST BEGIN/ VTAC

HR = 139

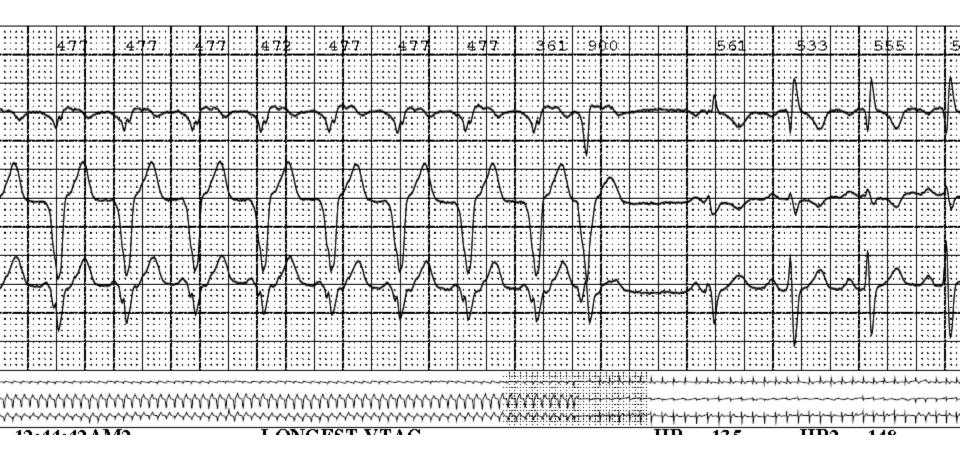
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12:13:21PM1

END OF EPISODE

HR = 82 HR2 = 130



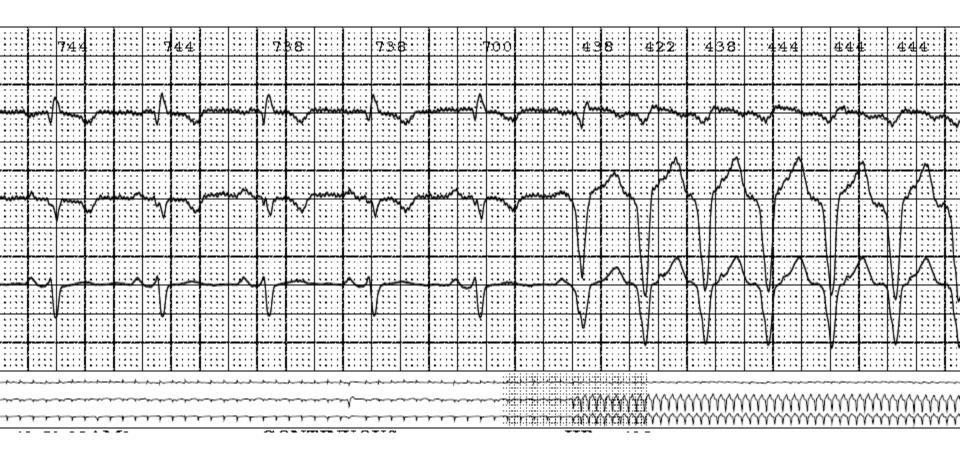




12:44:42AM2

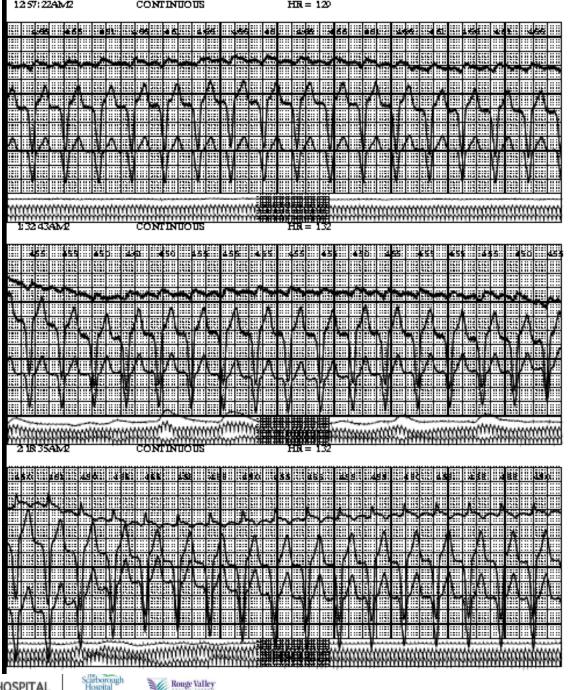
LONGEST VTAC

HR = 135 HR2 = 148









SCARBOROUGH AND ROUGE HOSPITAL



Report

- Underlying rhythm is sinus with RBBB, LAD and a normal PR interval. Rate range is elevated, mean HR is 101. Very frequent ventricular ectopy with runs of VT. Rare atrial ectopy with no runs see. No pauses noted, no symptoms reported.
- Impression: Frequent and long runs of VT at a rate of 130 bpm. Urgent cardiac evaluation arranged.

Case 5

Date of Birth	2/23/1956	Sean Number:	DR T. VAN
D #	65 7-6	Date Recorded:	10/6/2016
Age	60 Years	Date Processed	10/15/2016
Sert	F	Recorder Nam:	016211
		HookupTech	SUBA
Indications	PALPITATIONS	Medications:	SALEUTOMOL, ASA
	CHEST PAIN, A.FIE		FRADACA
			EID BSONIEDB

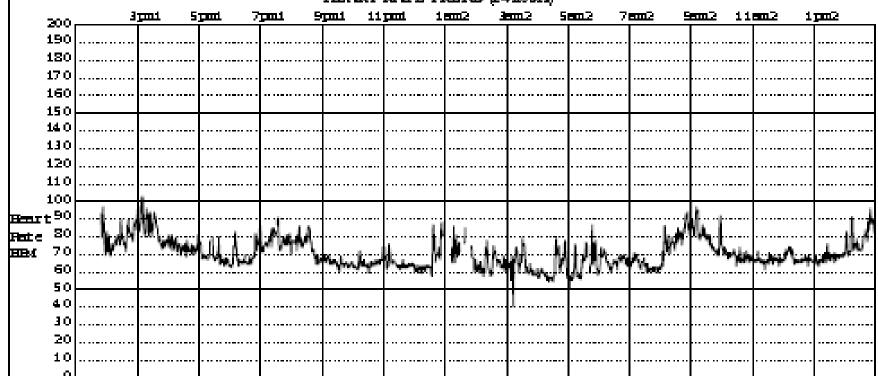


Rouge Valley

analyzed was 38:12 nours. Start time was 1:45841. There were a total of 158402 Beats. Less than 10 were Ventricular beats, less than 10 were Supreventricular beats, and less than 10 were Paced beats.

Mean Heart Rate:	69					
Maximum Heart Refe	: 133 ed:	3:10:51FM	1			
Minimum Heart Refe	: 41 mt	6:52:27430	3			
Pauses:	0 (0	Greater the	an 3.0 sec.)			
Ventricular Betopy			Supraventr icu iar	Betopy		
Totai:		6	Totai:		0	
Single:		5	Single :		0	
Pairs:		0	Pairs:		0	
Totai Rans:		0	Total Runs:		0	
Bests in Rans:		0	Bente in Rone:		0	
+	tents	Prate	+	teats	erate	
Longest Rm:	00	1 :45 PM	0 Longest Rnn:	0 e	1 :4 5PM	0
Pastest Rm:	00	1 :45PM	0 Fastest Ran :	0 e	1 :4 5PM	0
Forf:	0	2	aberrent:	0		
HR Variabi	ility		ST Absointe			
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DNNS 0: FMEED:			Bievation :			





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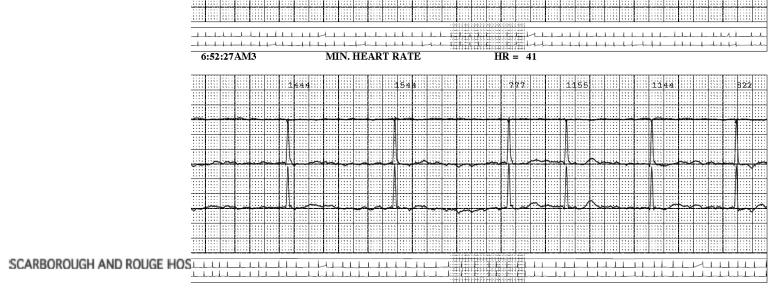


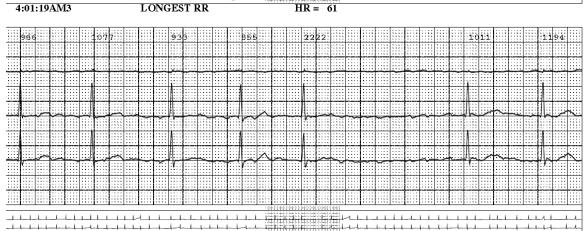
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7:13:52AM2	VFB	HR	= 80			
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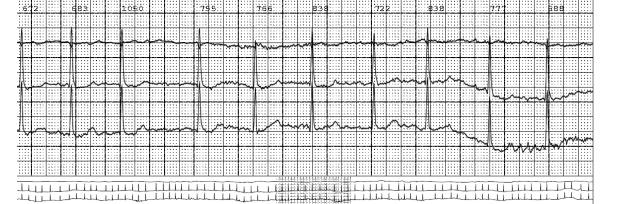
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0.502.05AM2 VFB	HR =	R= 69				

IRREGULAR RR







HR = 61

4:56:43PM2 IRREGULAR RR

4:01:19AM3

HR = 76

Report

- Atrial fibrillation with a normal rate range. Rare ventricular ectopy with no significant runs seen. No pauses noted.
- Impression: Atrial fibrillation, patient is anticoagulated.

Case 6

	-,, ·		
ID #	9955-129	Date Recorded:	10/18/2016
Age	79 Years	Date Freessed	10/22/2016
Ser	м	Recorder Num:	023540
		HookupTech:	234
Indications	Palpitations	Medications:	NONE FECORDED

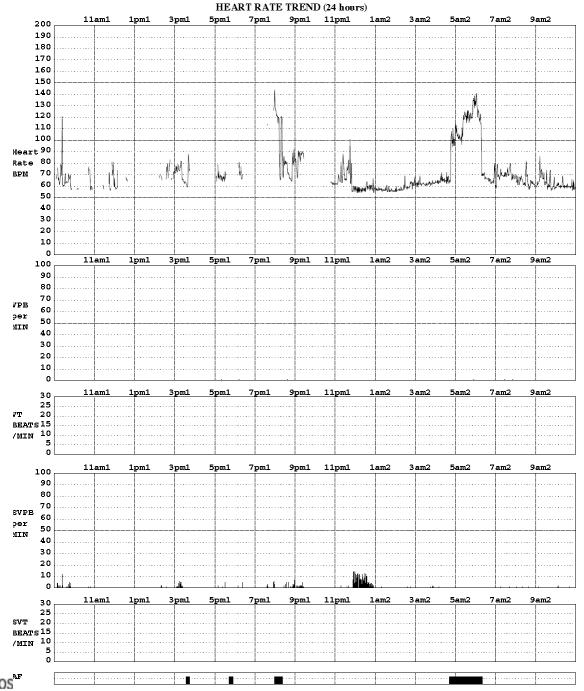




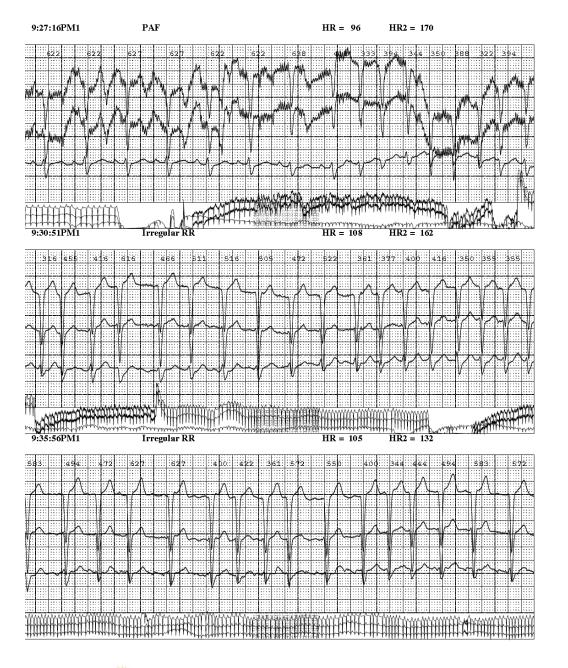
was 37:49 hours. Start time was 9:042041. There were a total of 167274 Beats. Less than 18 were Ventricular beats, less than 18 were Supreventricular beats, and less than 18 were Paced beats.

Mean Beart Pate: Maximum Beart Pate: Minimum Beart Pate: Pauses:	50 et		.3.0 gec.)			
Ventricular Betopy			Supraventr icular	Betopy		
Totai:		35	Total:		857	
Single:		35	Single :		849	
Pairs:		0	Pairs:		4	
Total Rans:		0	Total Runs:		0	
Beats in Rans:		0	Bente in Rome:		0	
+	tents	erate	+	tents	erate	
Longest Rm.:	00	9:0 1236	0 Longest Rnn:	0 e	9:04 <u>23/11</u>	0
Pristest Rm:	oe	9 : 0 42341	0 Pastest Fan:	0 e	9:04 4 341	0
Ronf:	0	<u>at</u>	errent:	0		
HR Variability ST Absointe						
SIDND:	212 ms		Degression :	XXX I		
17305 0 : FMEED :	22.12 8 87 ms		Bievation :	×× × I		





SCARBOROUGH AND ROUGE HOS









Report

- Quality of study is limited. Normal sinus rhythm with paroxysmal atrial fibrillation and a normal rate range. No ectopy with no runs seen. No pauses seen. Symptoms were reported during atrial tachycardia and atrial fibrillation.
- **Impression:** Sinus rhythm with paroxysmal atrial fibrillation. Consider anticoagulation.

Indications for Symptoms related to Rhythm Disturbances

- Patients with unexplained recurrent palpitations.
- Patients with unexplained syncope, near syncope, or episodic dizziness.
- Patients with episodic shortness of breath, chest pain, or fatigue that is not otherwise explained.
- Neurological events when transient atrial fibrillation or flutter is suspected.
- Cerebrovascular accidents without other evidence of arrhythmias.

Indications for patients without symptoms from arrhythmia

- Post-MI patients with ejection fraction < 40%.
- Congestive Heart Failure.
- Idiopathic hypertrophic cardiomyopathy.
- Sustained myocardial contusion.
- Systemic hypertensive patients with LV hypertrophy.
- Post-MI patients with normal LV function.
- Pre-operative arrhythmia evaluation.
- Patients with Sleep Apnea.
- Patients with valvular heart disease.

Indications for Heart Rate Variability

- Post-MI patients with LV dysfunction.
- Congestive Heart Failure.
- Idiopathic hypertrophic cardiomyopathy.
- Post-MI patients with normal LV function.
- Diabetics to evaluate for diabetic neuropathy.
- Rhythm disturbances that preclude HRV analysis.

Indications to assess Anti-arrhythmic Therapy

- To assess anti-arrhythmic drug response in individuals in whom baseline frequency of arrhythmia has been characterized as reproducible and of sufficient frequency to permit analysis.
- To detect pro-arrhythmic responses to anti-arrhythmic therapy in patients at high risk.
- To assess rate control during atrial fibrillation.
- To document recurrent or asymptomatic nonsustained arrhythmias during therapy in the outpatient setting

Indications for Pacemaker and ICD

- Suspected pacemaker or ICD failures.
- Post-operative evaluation of pacemaker and ICD.

Indications for Ischemia Monitoring

- Patients with suspected variant angina.
- Patients with chest pain who cannot exercise.
- Pre-operative for vascular surgery who cannot exercise
- Patients with known CAD.
- Patients with atypical chest pain syndrome.
- Initial evaluation of patients with chest pain who are able to exercise