Cardiology data for GPs…

ECGs/24 hr BPs and echo interpretation…

RHYTHMS IN GENERAL PRACTICE

- SYMPTOM – PALPITATION ?inv
  - HISTORY
  - ECG
  - 24 HOUR TAPE
  - ECHOCARDIOGRAM
- SYMPTOM – SYNCOPE OR DIZZINESS ?inv
  - HISTORY
  - ECG
  - 24 HOUR TAPE
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RHYTHMS IN GENERAL PRACTICE

- SYMPTOM – PALPITATION
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- SYMPTOM – SYNCOPE OR DIZZINESS
  - HISTORY
  - ECG
  - 24 HOUR TAPE
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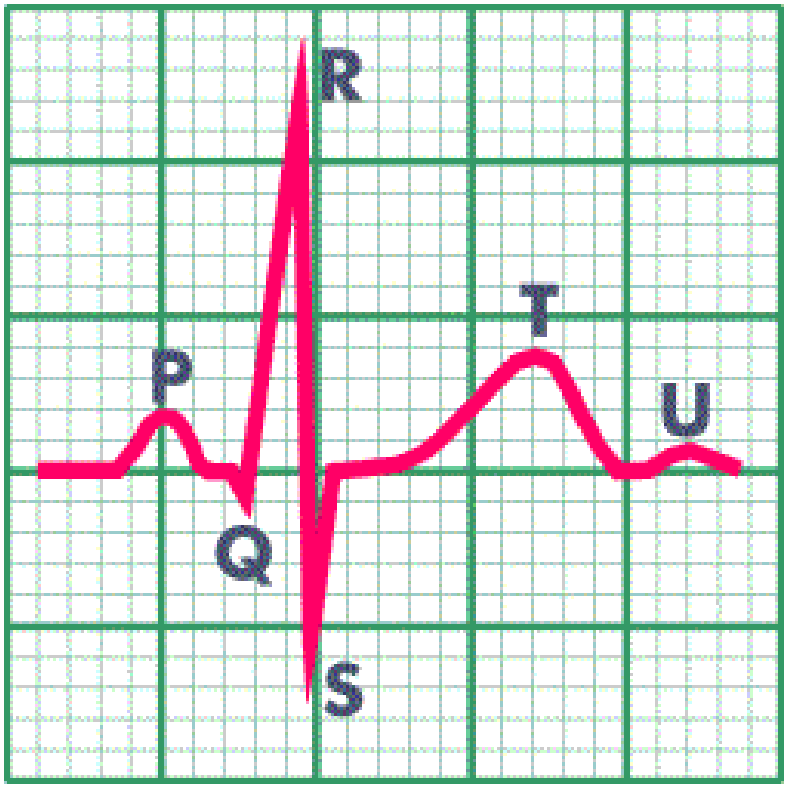
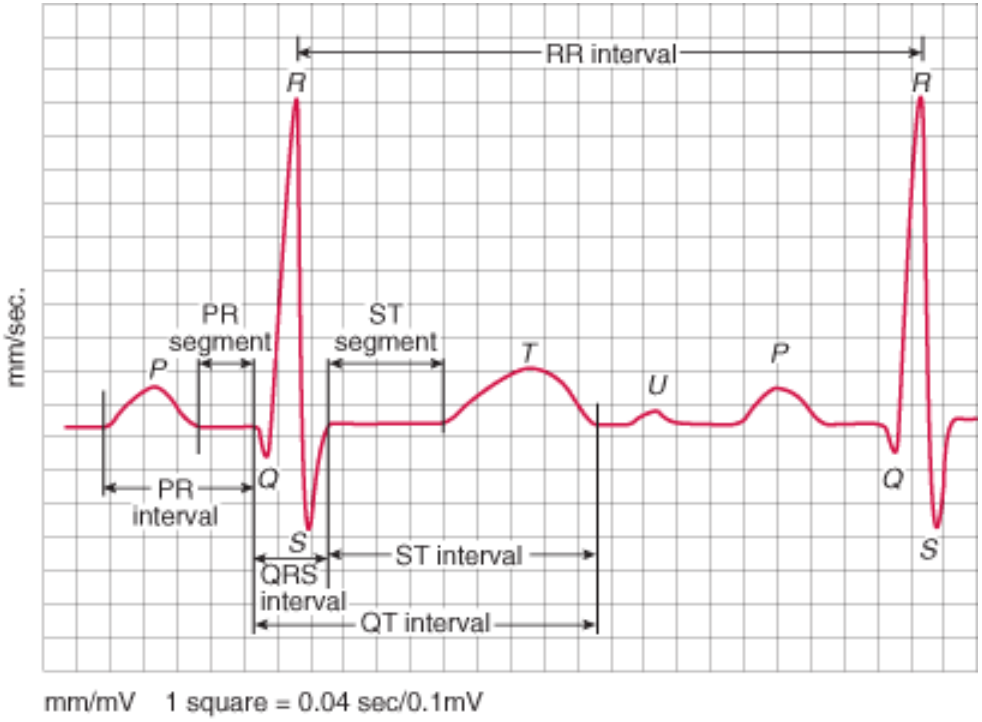
ECG-Waveforms



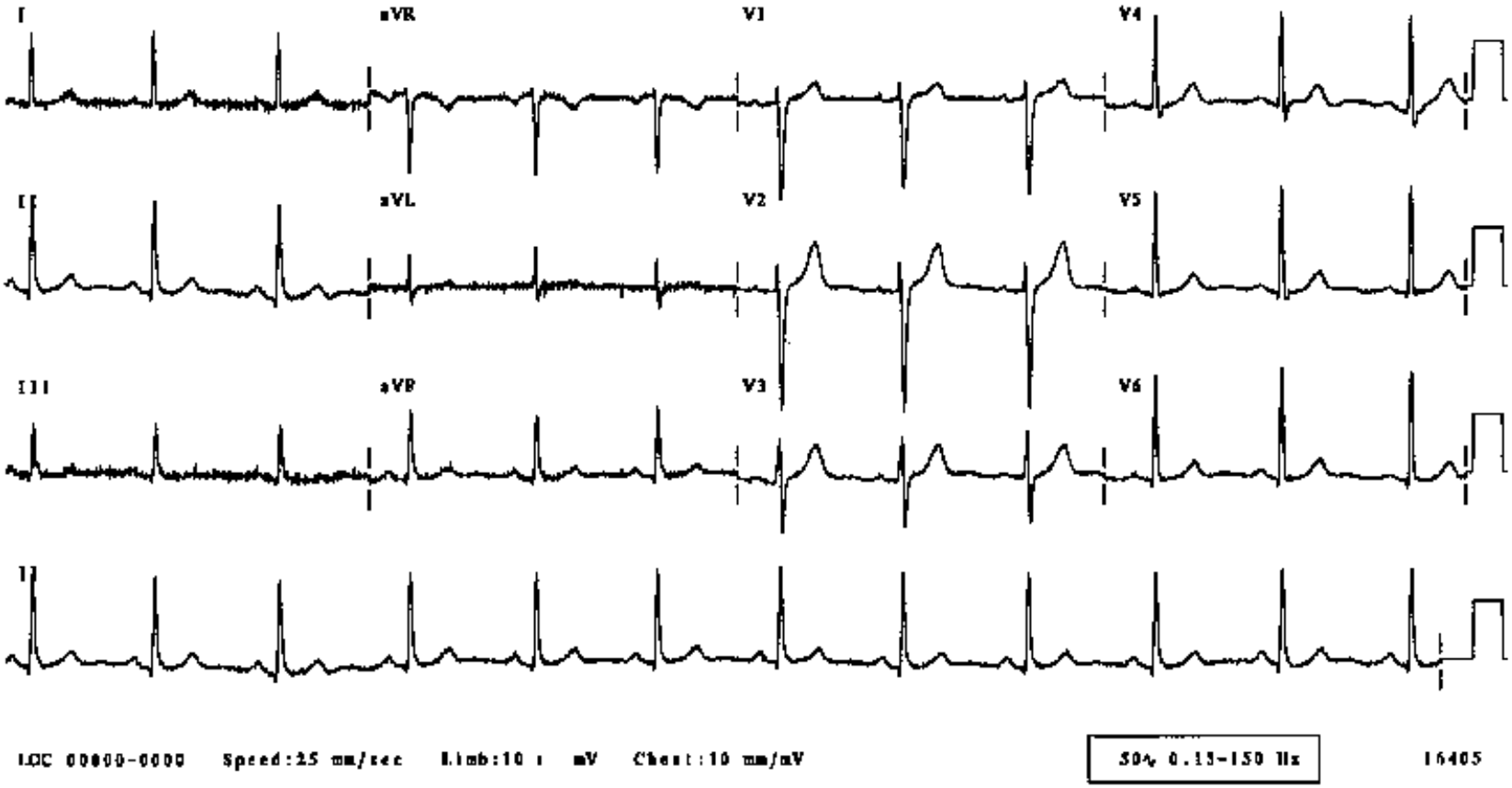
Normal Intervals

- PR
  - 0.20 sec (less than one large box)
- QRS
  - 0.08 – 0.10 sec (1-2 small boxes)
- QT
  - 450 ms in men, 460 ms in women
  - Based on sex / heart rate
  - Half the R-R interval with normal HR



What is this rhythm?

Normal sinus rhythm



Rate

- What is normal ?
- Q- what's definition of tacycardia?
- Q- what's the definition of bradycardia?
- HR of 60-100 per minute is normal
- HR > 100 = tachycardia

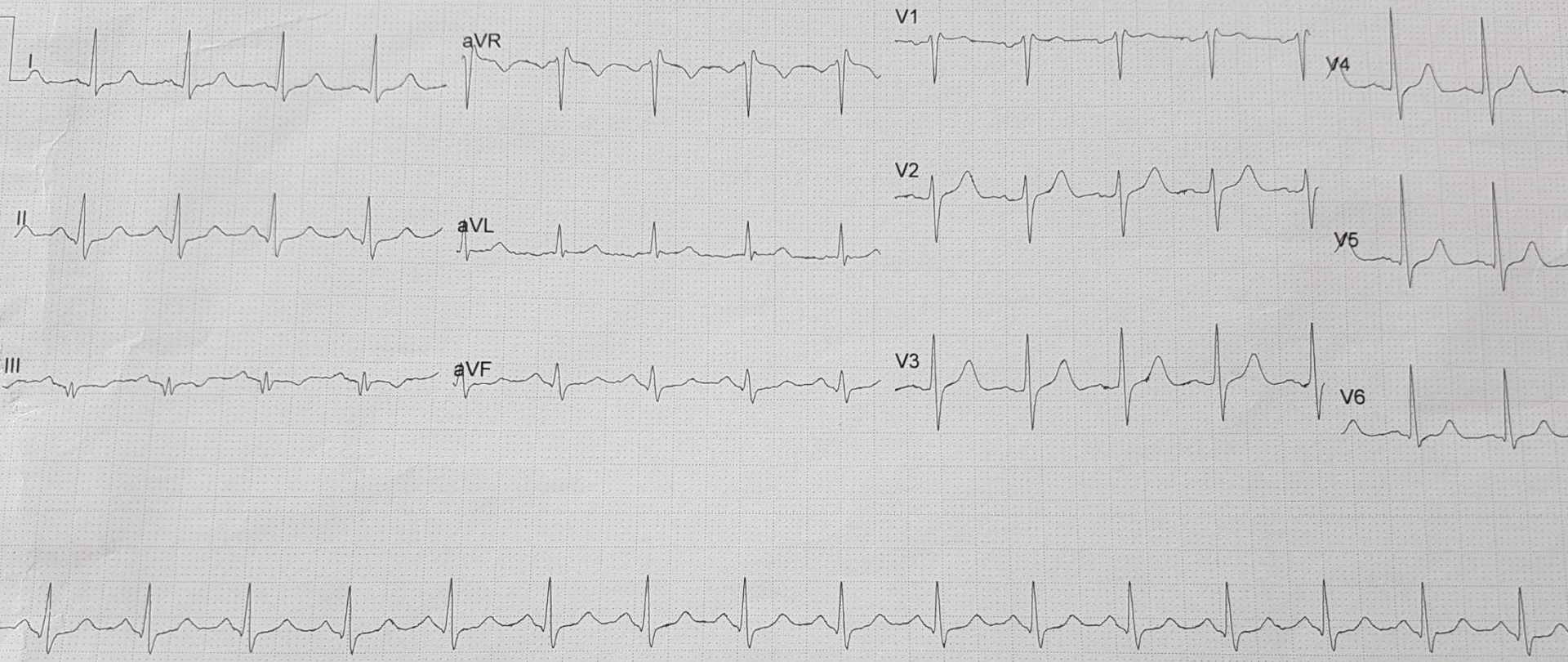
HR	107
AVG RR (ms)	560

Resting ECG Evaluation from 03.04.2017 08:54 clock

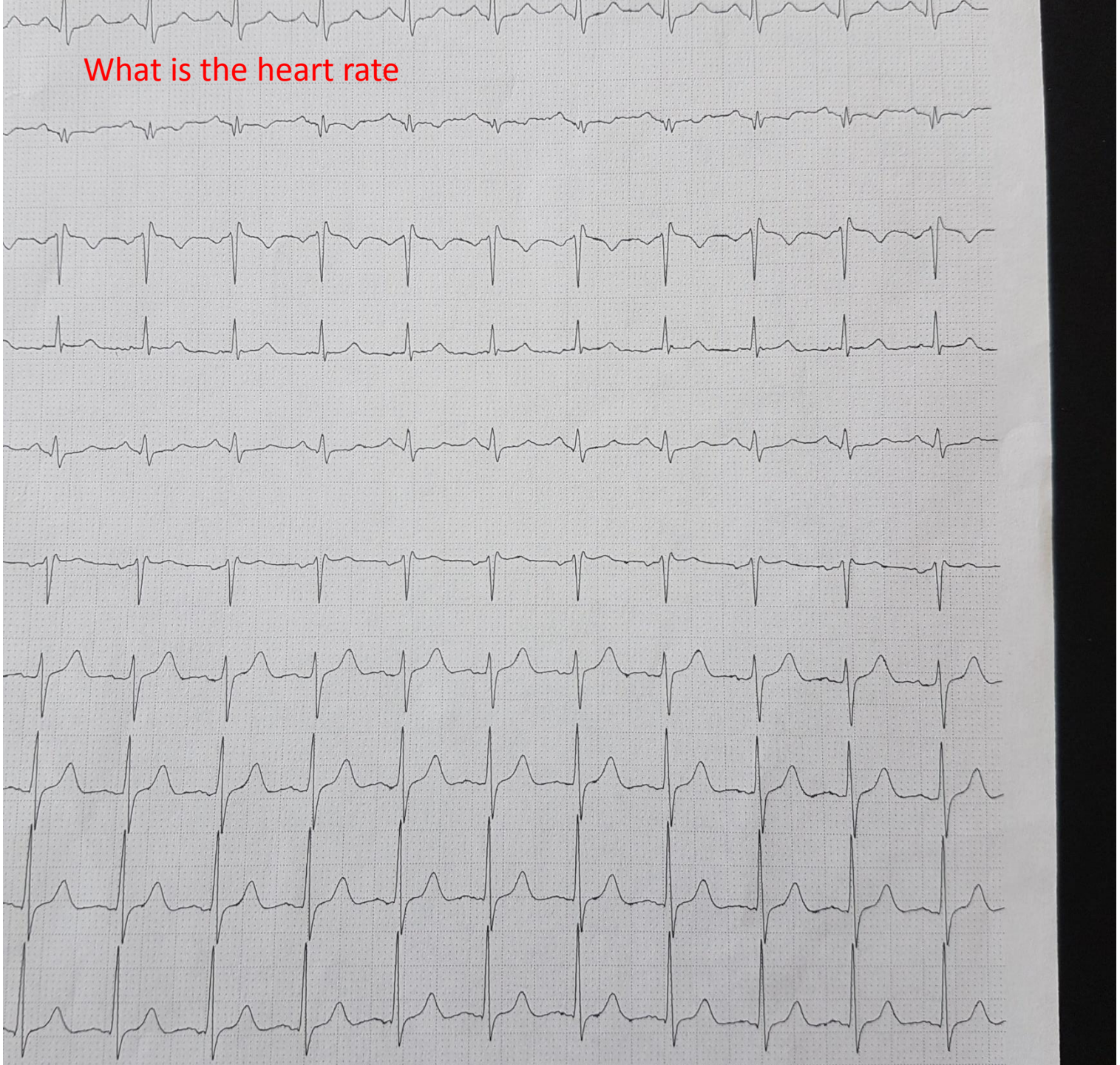
Analysed ECG HR: 107

(25 mm/s 10 mm

What is the heart rate ?



lio 150 4.3.2 Build 17661 (seca ct 32x)


What is the heart rate

Differential Diagnosis of Tachycardia

Tachycardia	Narrow Complex	Wide Complex

Differential Diagnosis of Tachycardia

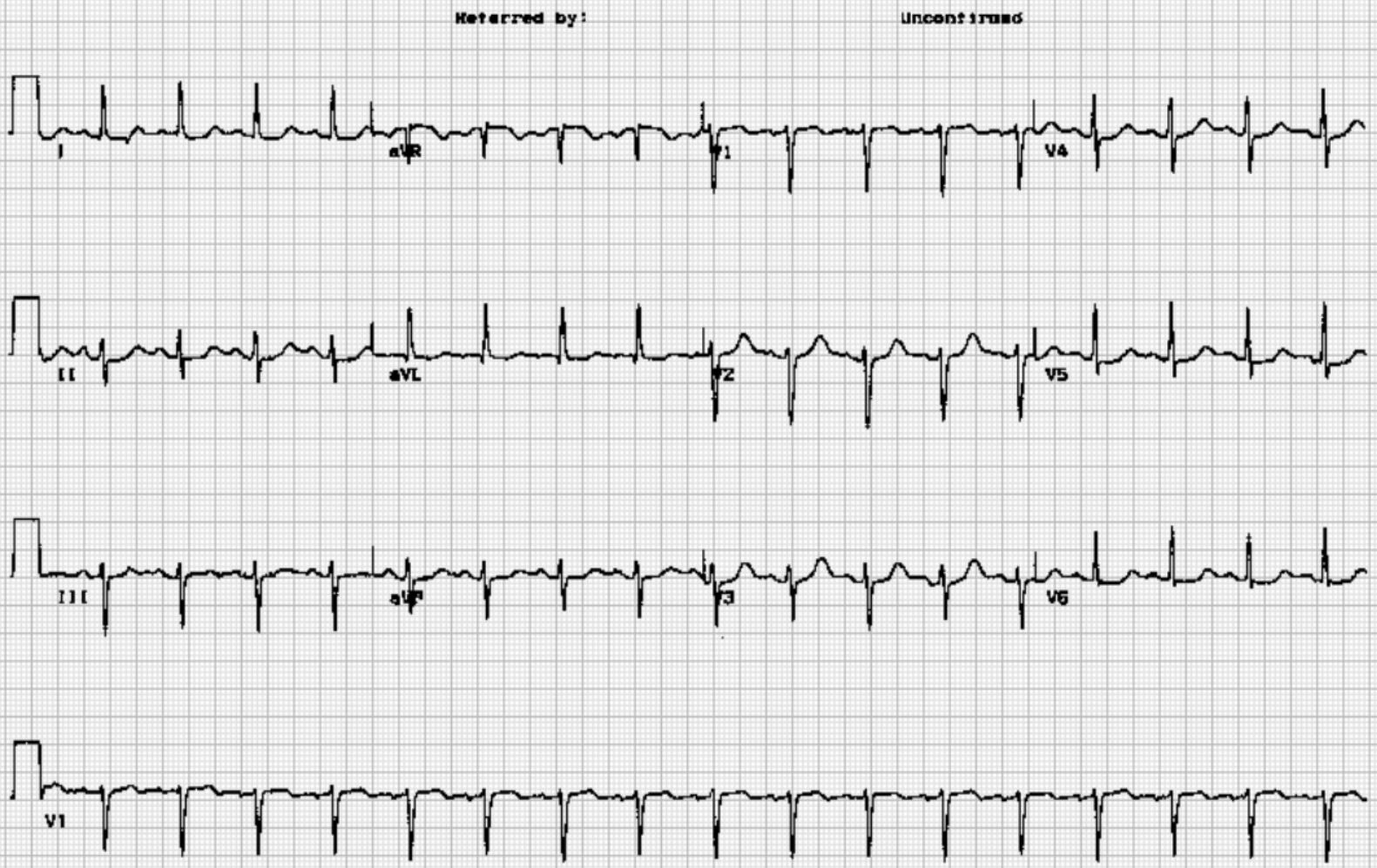
Tachycardia	Narrow Complex	Wide Complex
Regular		
Irregular		

Differential Diagnosis of Tachycardia

Tachycardia	Narrow Complex	Wide Complex
Regular	Sinus Tachy SVT Atrial flutter 	

A 34 year old lady with asthma.

What kind of tachycardia is this?



- **P wave rate greater than 100 bpm**

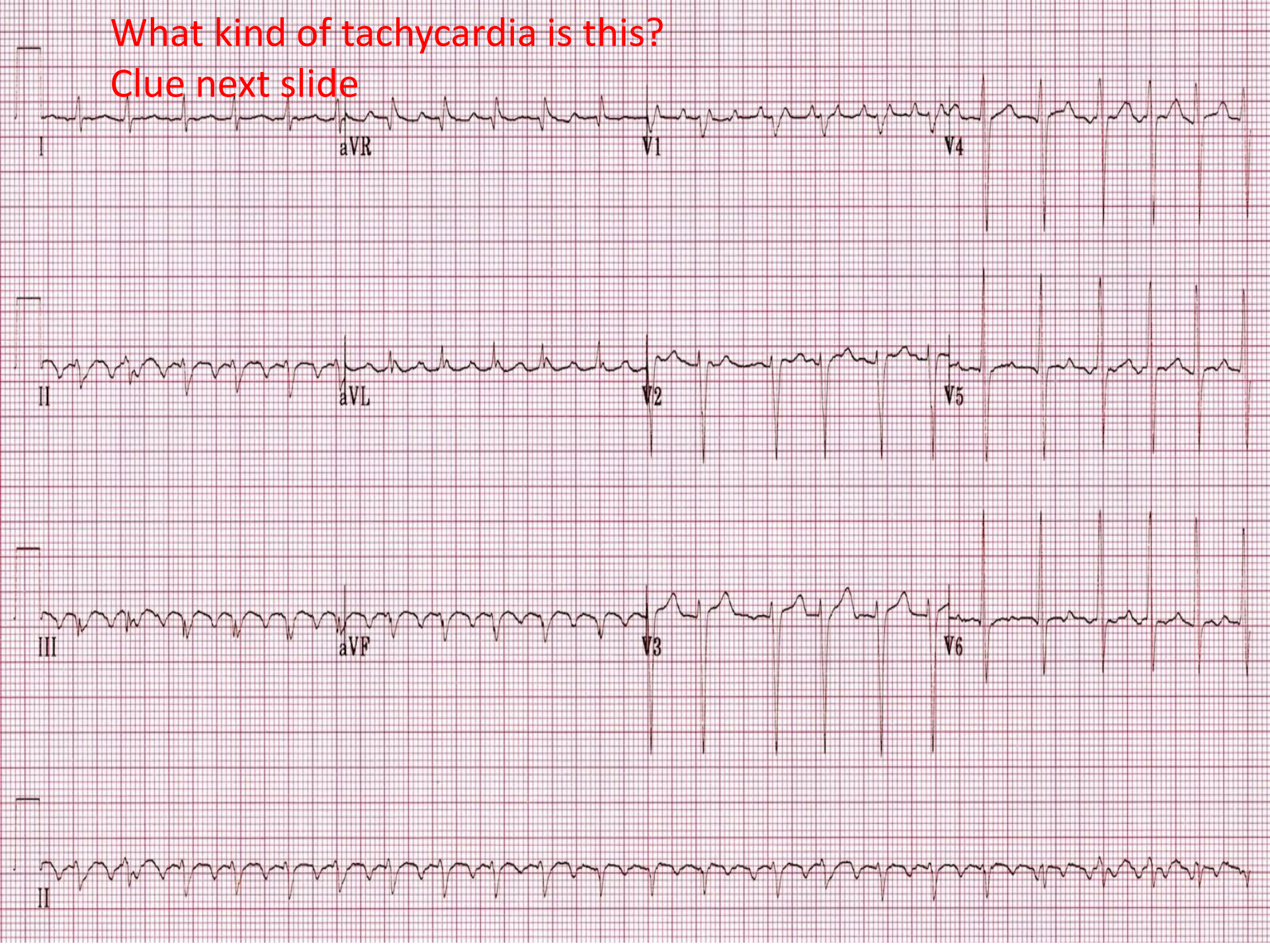
See also sinus bradycardia.

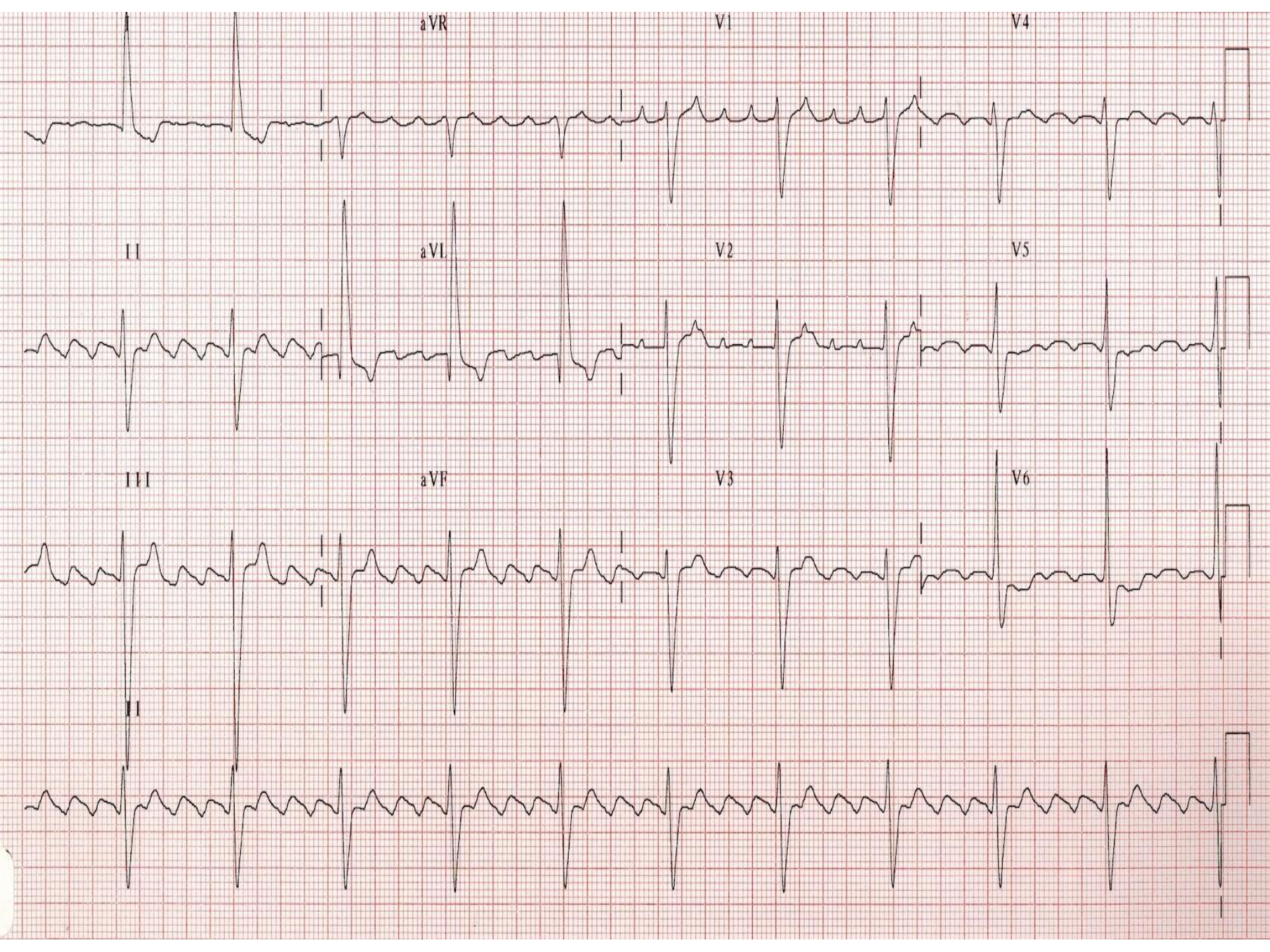
Differential Diagnosis of Tachycardia

Tachycardia	Narrow Complex	Wide Complex
Regular	Sinus Tachy SVT Atrial flutter	+BBB +BBB VT

What kind of tachycardia is this?

Clue next slide



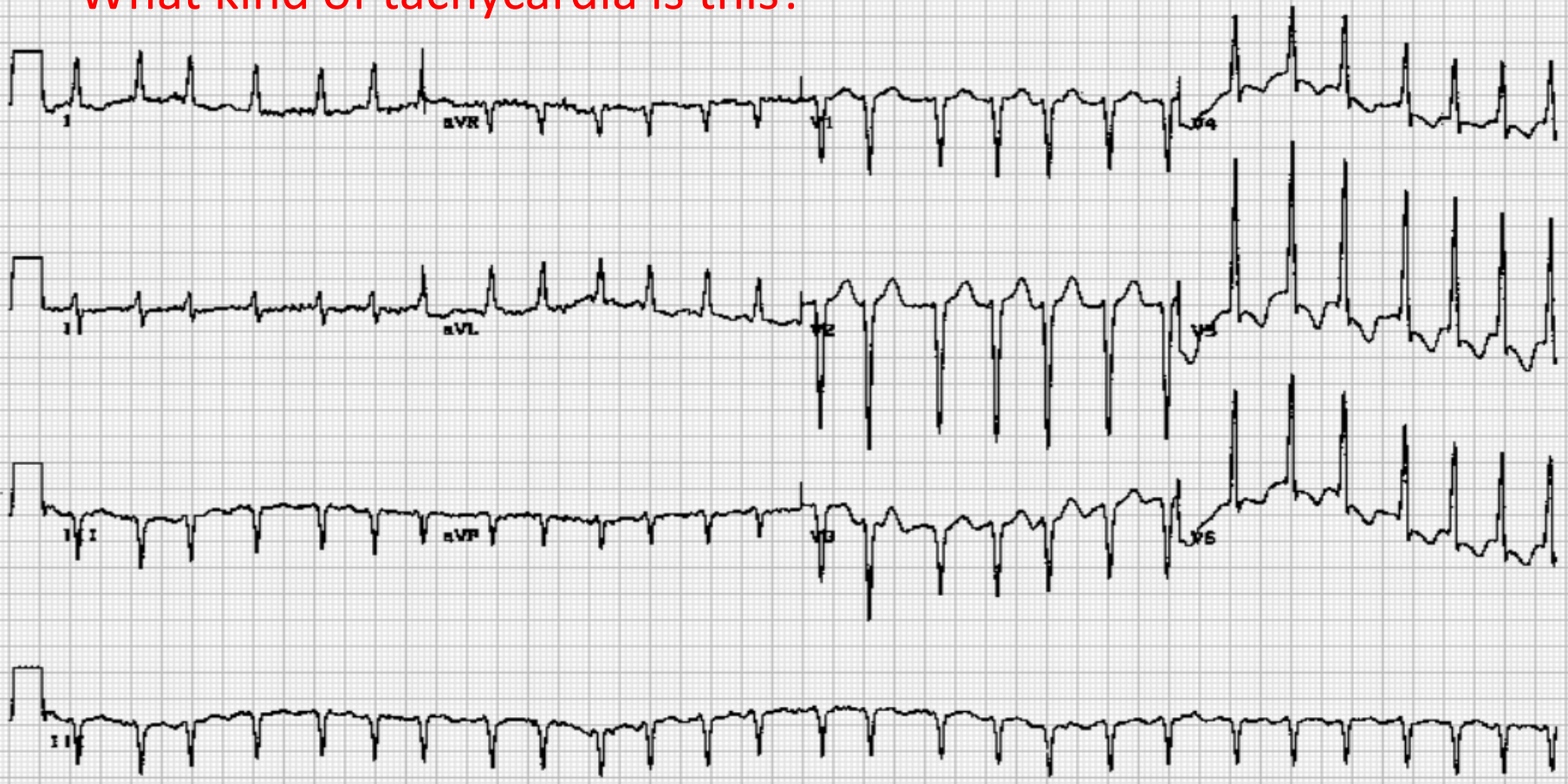

I
aVR
V1
V4
II
aVL
V2
V5
III
aVF
V3
V6
II

Differential Diagnosis of Tachycardia

Tachycardia	Narrow Complex	Wide Complex
Irregular	Atrial fibrillation	+BBB VT

A 76 year old man with breath

What kind of tachycardia is this?



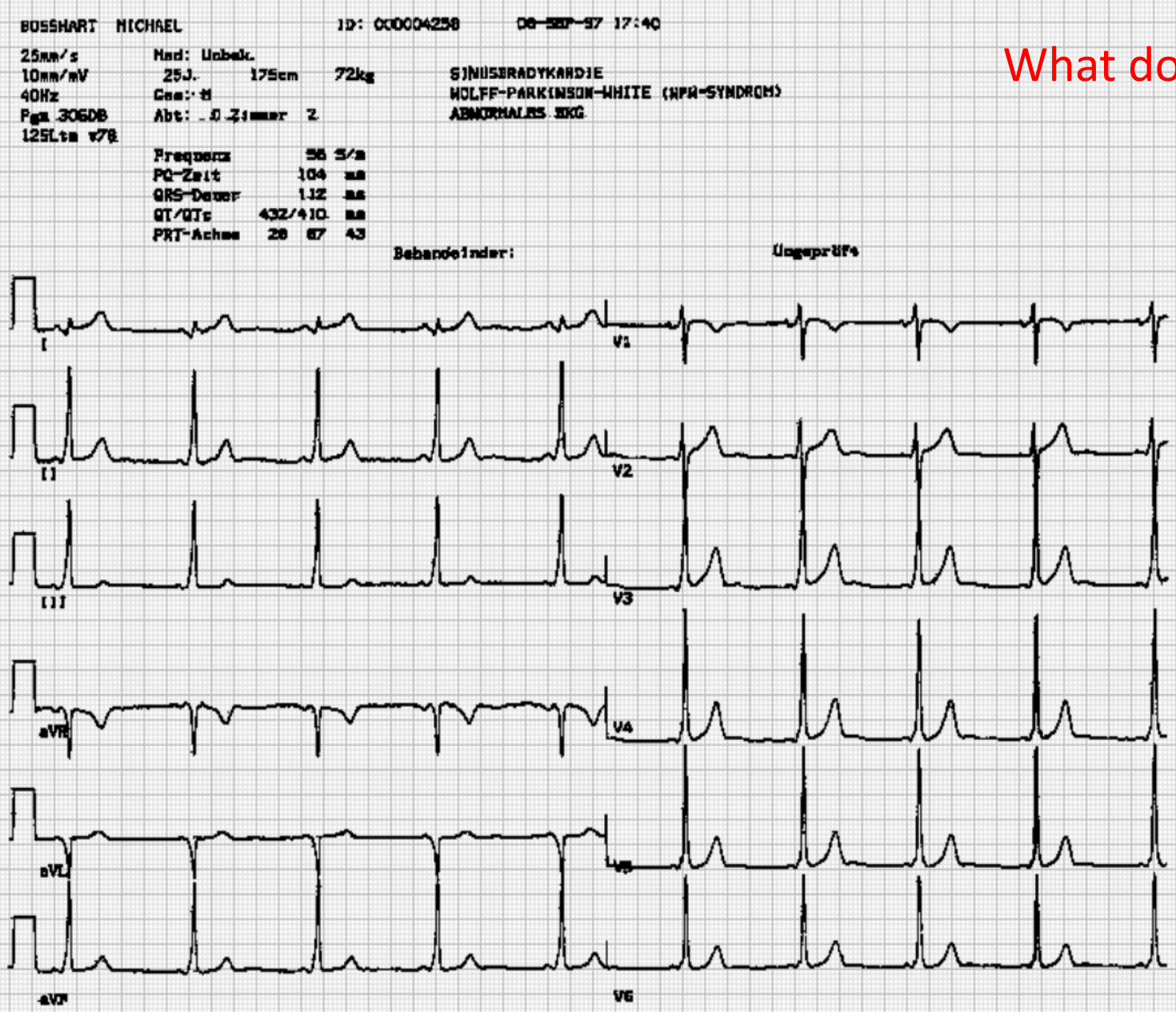
At[redacted]e

- Irregularly irregular ventricular rhythm.
- Sometimes on first look the rhythm may appear regular but on closer inspection it is clearly irregular.

Differential Diagnosis of Tachycardia
very basic !

Tachycardia	Narrow Complex	Wide Complex
Regular	Sinus Tachy SVT Atrial flutter	+BBB +BBB VT
Irregular	Atrial fibrillation	+BBB VT

A 25 year old man with bouts of tachycardia.



What do you notice abo

What is normal ?

- Sinus tachycardia: maximal rate about 110/min

When to refer a tachycardia *

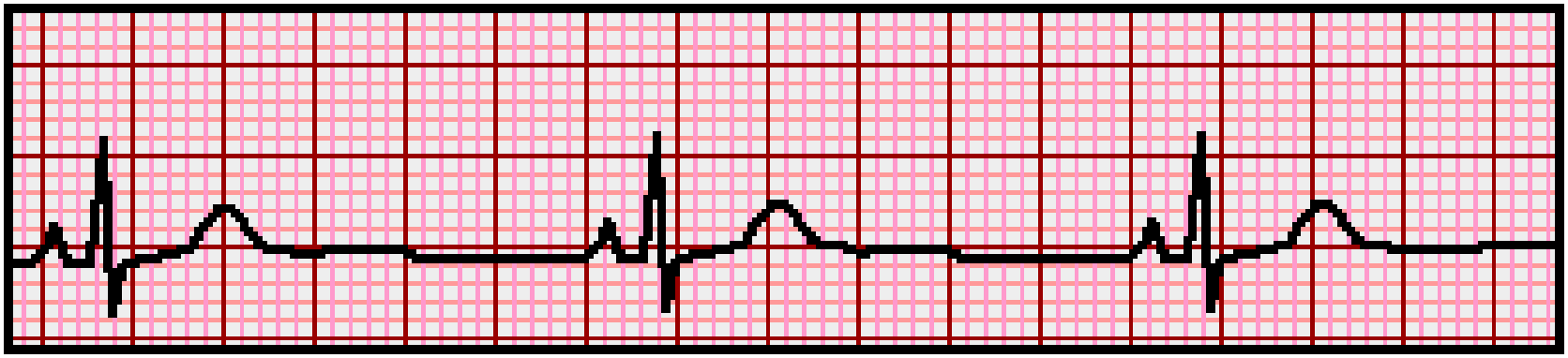
- Sinus tachycardia?
- fast Atrial fibrillation ?
- An atrial flutter ?

Where to refer ?

AMAC/AMU/OPA

When to call an ambulance?

What is the heart rate?



www.uptodate.com

(300 / 6) = 50 bpm

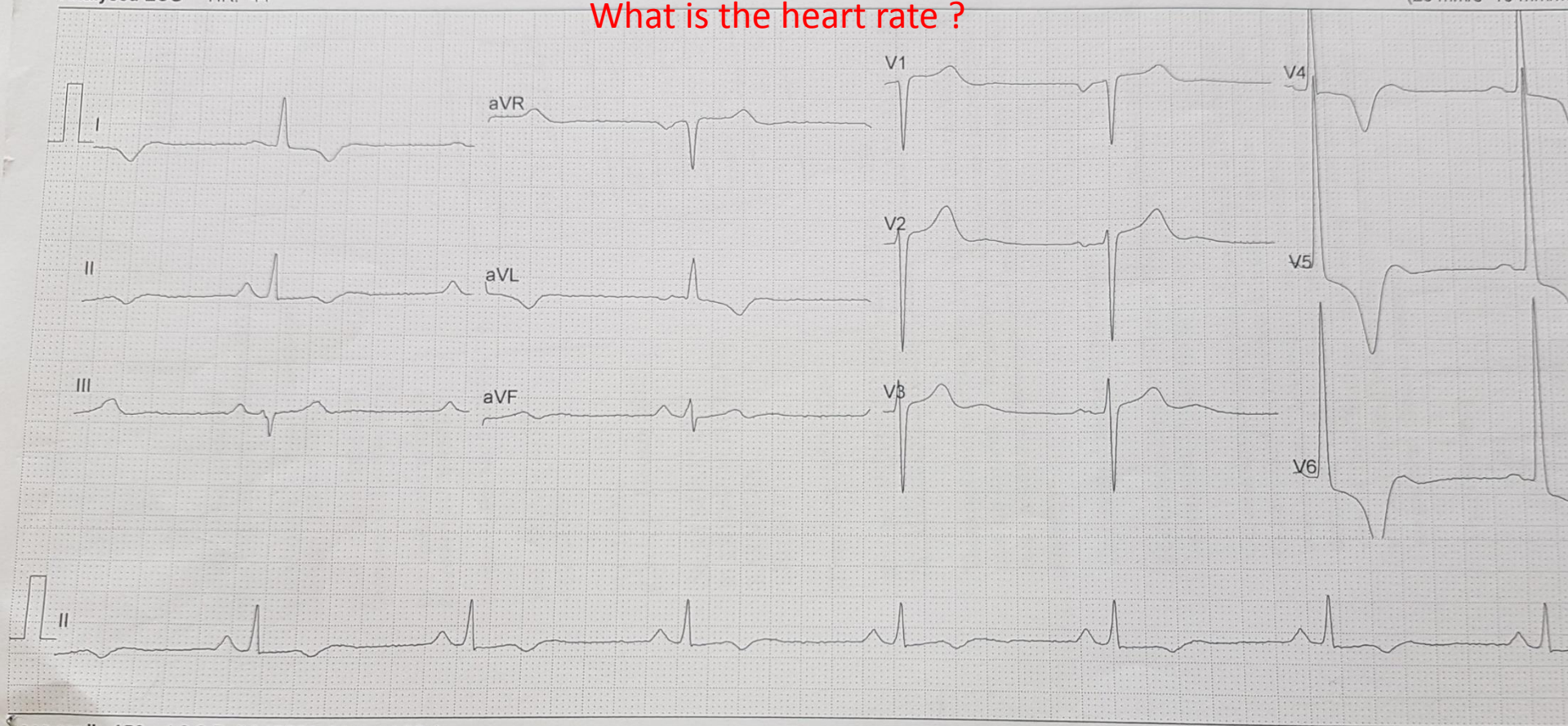
Date of birth	24.02.1958
Age	59

QRS axis	19°
HR	44
AVG RR (ms)	1363

Resting ECG Evaluation from 20.03.2017 09:10 clock

Analysed ECG HR: 44 (25 mm/s 10 mm/m

What is the heart rate ?



Seca cardio 150 4.3.2 Build 17661 (seca ct 32x) 20.03.20

Rate

- HR of 60-100 per minute is normal
- HR < 60 = bradycardia

What is normal ?

- Sinus bradycardia: minimal rate about 45/min; minimal instantaneous rate during sleep about 35/min
- Sinus arrhythmia

When to refer a sinus bradycardia?*

Where to refer ?

AMAC/AMU/OPA

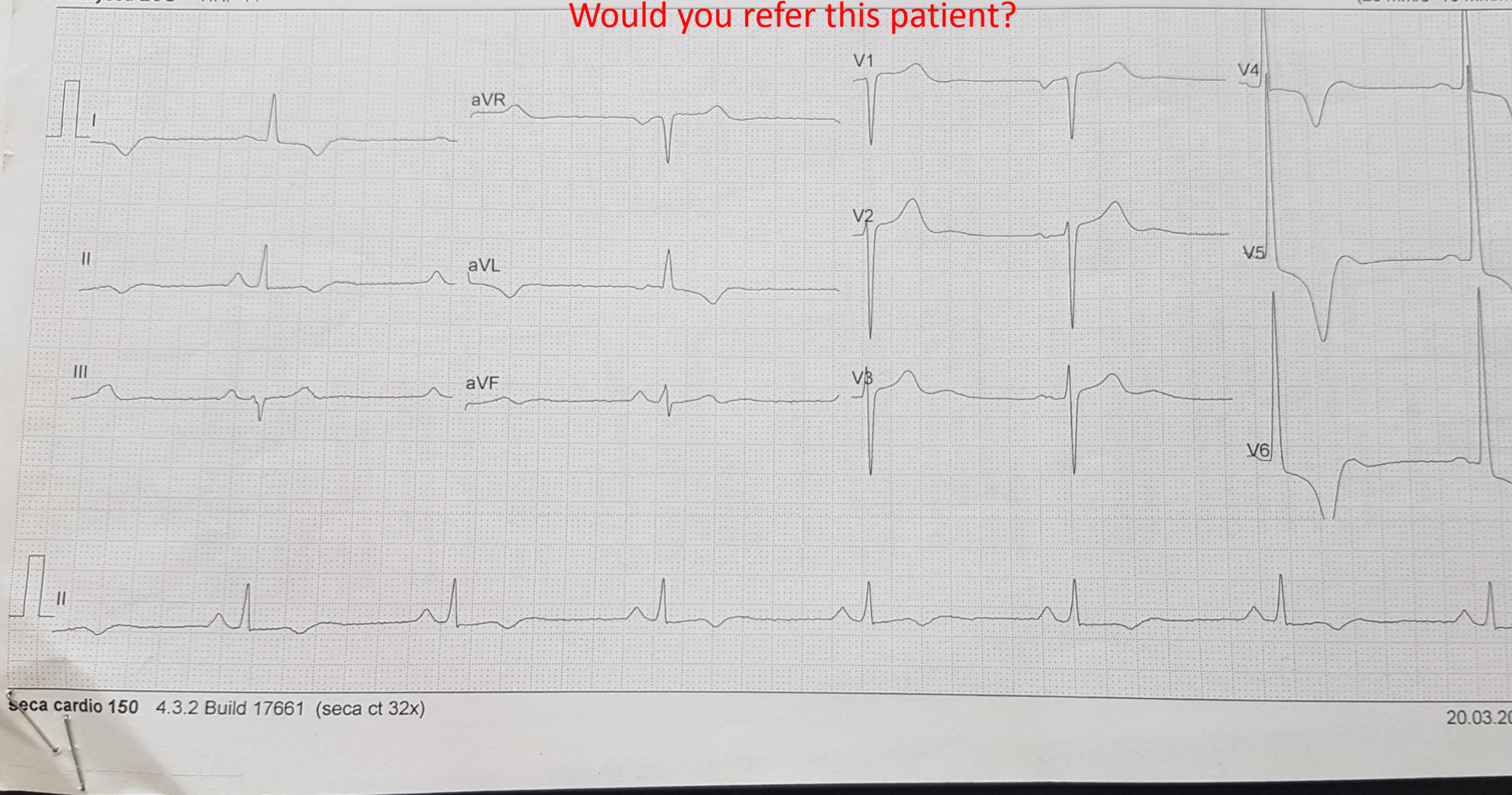
Date of birth	24.02.1958
Age	59

QRS axis	19°
HR	44
AVG RR (ms)	1363

Resting ECG Evaluation from 20.03.2017 09:10 clock

Analysed ECG HR: 44 (25 mm/s 10 mm/m

Would you refer this patient?



Seca cardio 150 4.3.2 Build 17661 (seca ct 32x) 20.03.20

Blocks (briefly)

- AV blocks
  - First degree block
    - PR interval fixed and > 0.2 sec
  - Second degree block, Mobitz type 1
    - PR gradually lengthened, then drop QRS
  - Second degree block, Mobitz type 2
    - PR fixed, but drop QRS randomly
  - Type 3 block
    - PR and QRS dissociated

Normal Intervals

- PR
  - 0.20 sec (less than one large box)
- QRS
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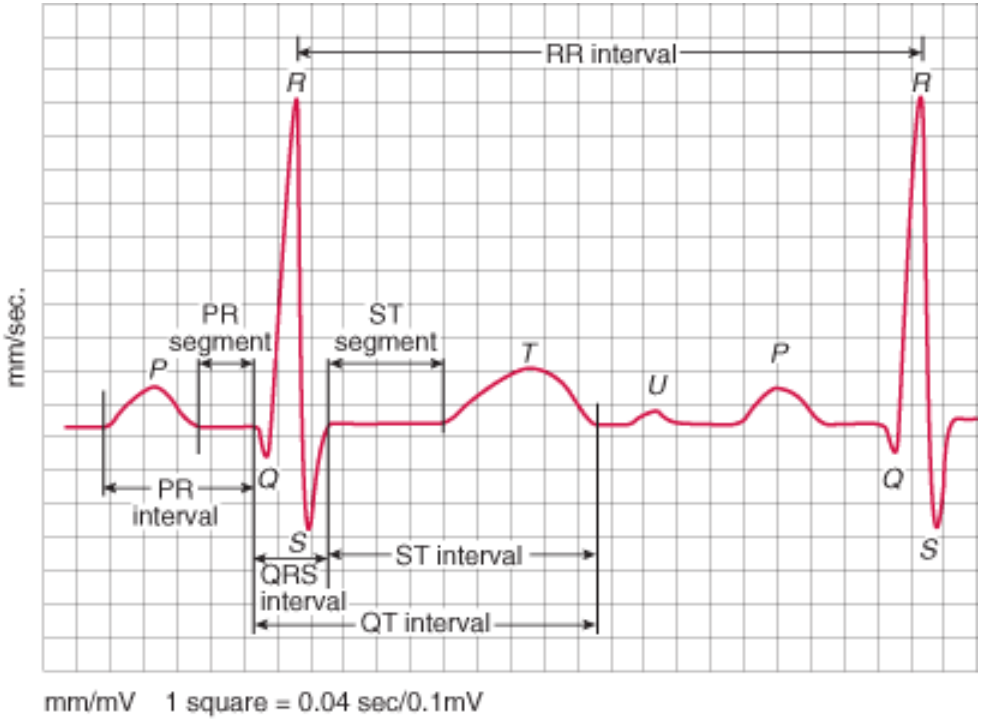


What is this rhythm?

First degree AV block

PR is fixed and longer than 0.2 sec

64Y Male HTN on medication – routine check up no symptoms

PR is fixed and longer than 0.2 sec

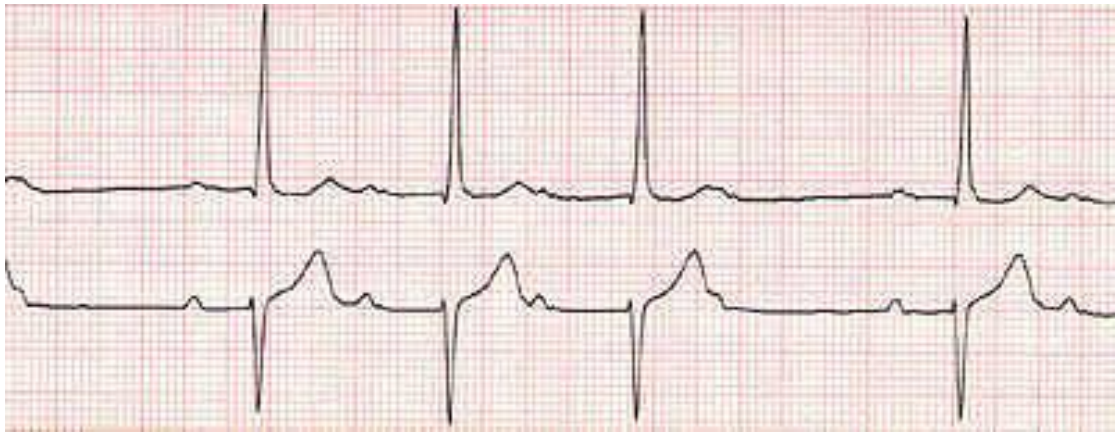
First degree AV block

What to do?

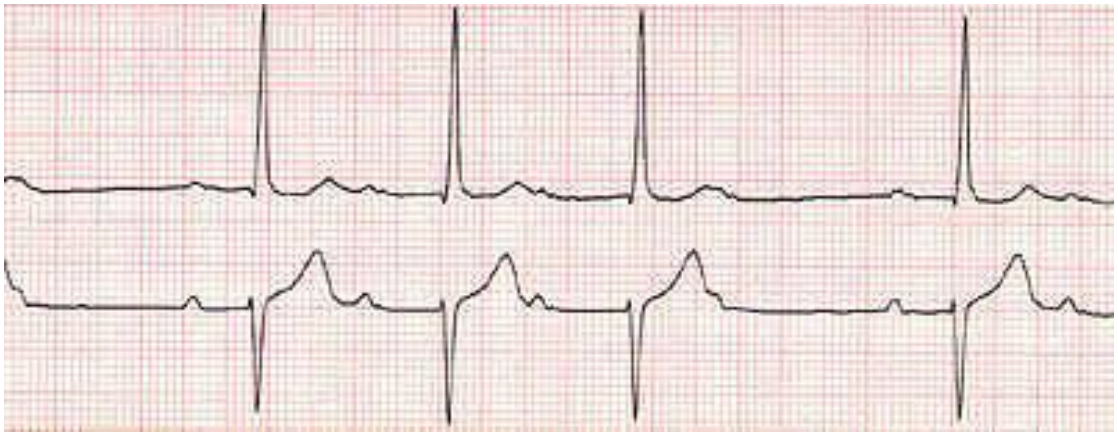
- No treatment
- Take care when adding or increasing dose of rate lowering drugs
- Investigate if patient has symptoms of syncope
- Normal in children and young adults *

What is this rhythm?

Type 1 second degree block (Wenckebach)



64Y Male HTN on medication – routine check up – no symptoms



Type 1 second degree block (Wenckebach)

What to do?

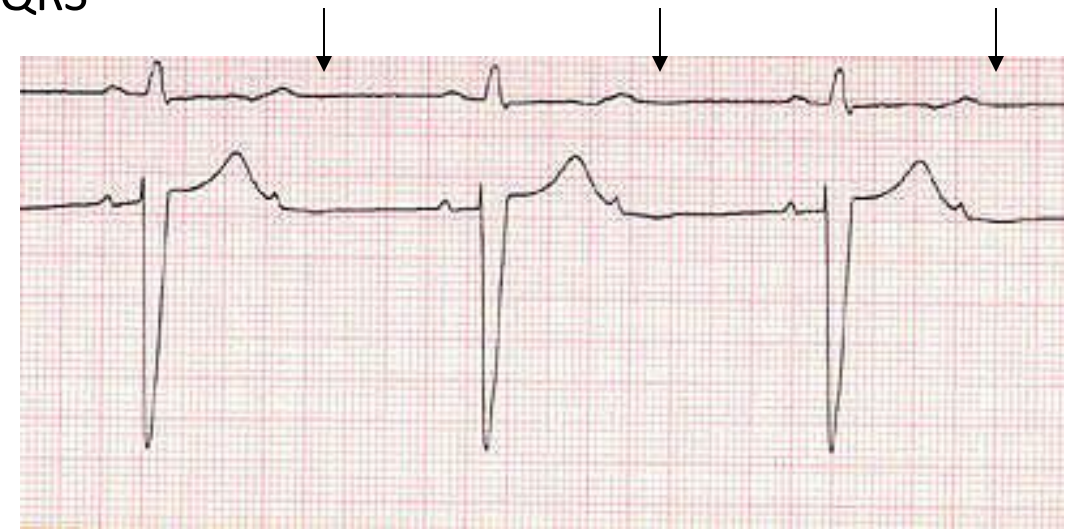
- No treatment
- Take care when adding or increasing dose of rate lowering drugs
- Investigate if patient has symptoms of syncope/dizziness
- Consider 24 hour tape *

What is this rhythm?

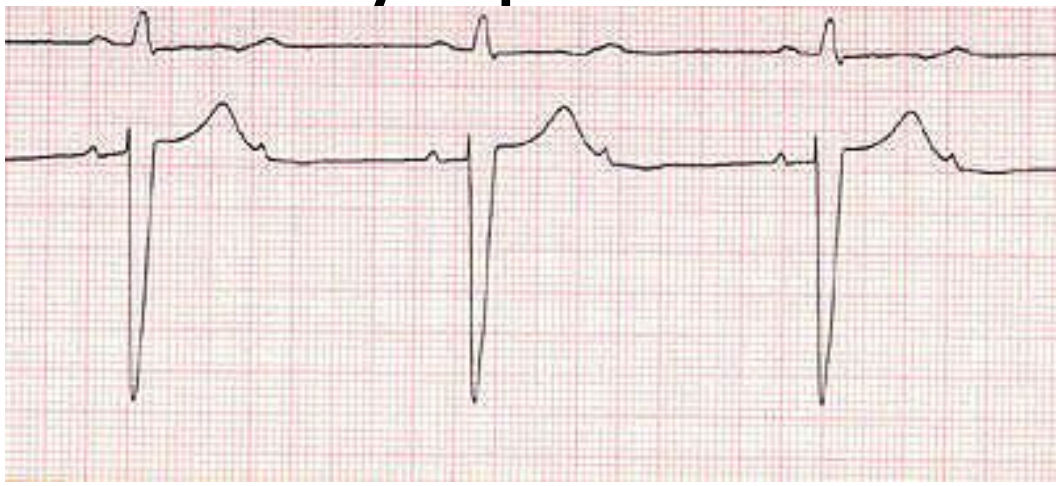
Type 2 second degree AV block

QRS

Dropped



64Y Male HTN on medication – routine check up – no symptoms



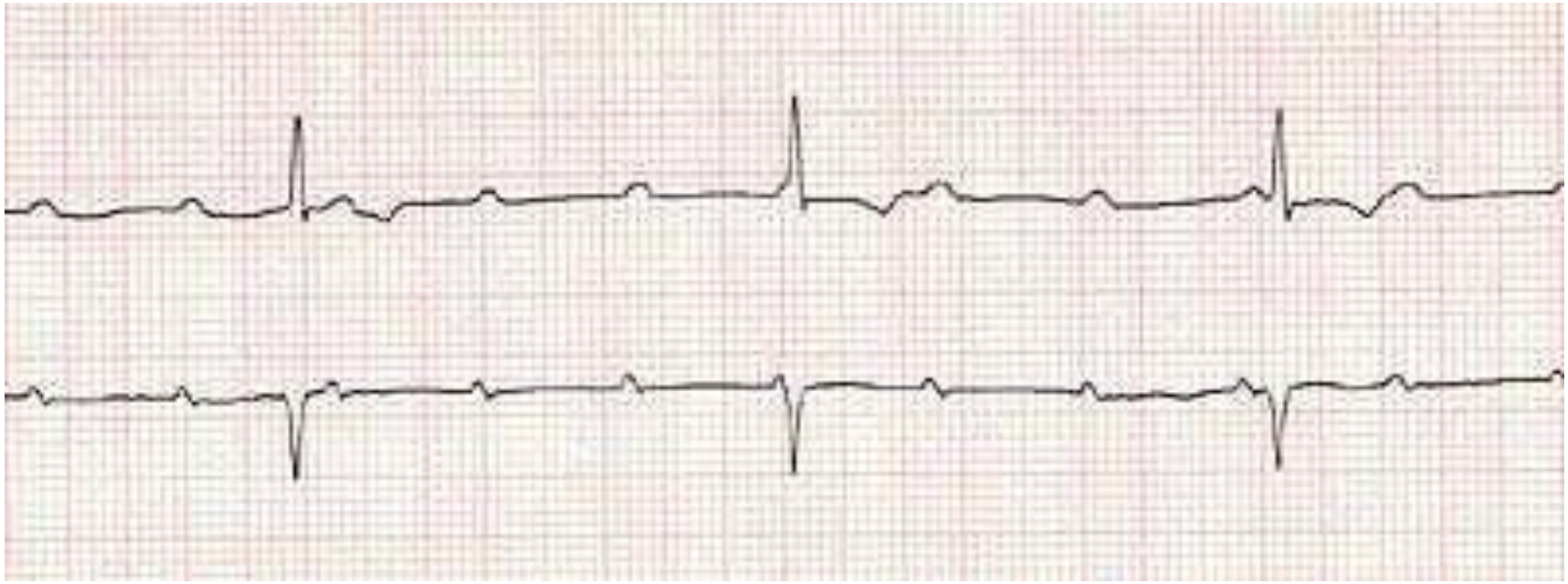
Scenario A
Type 2 – 2nd degree AV Block

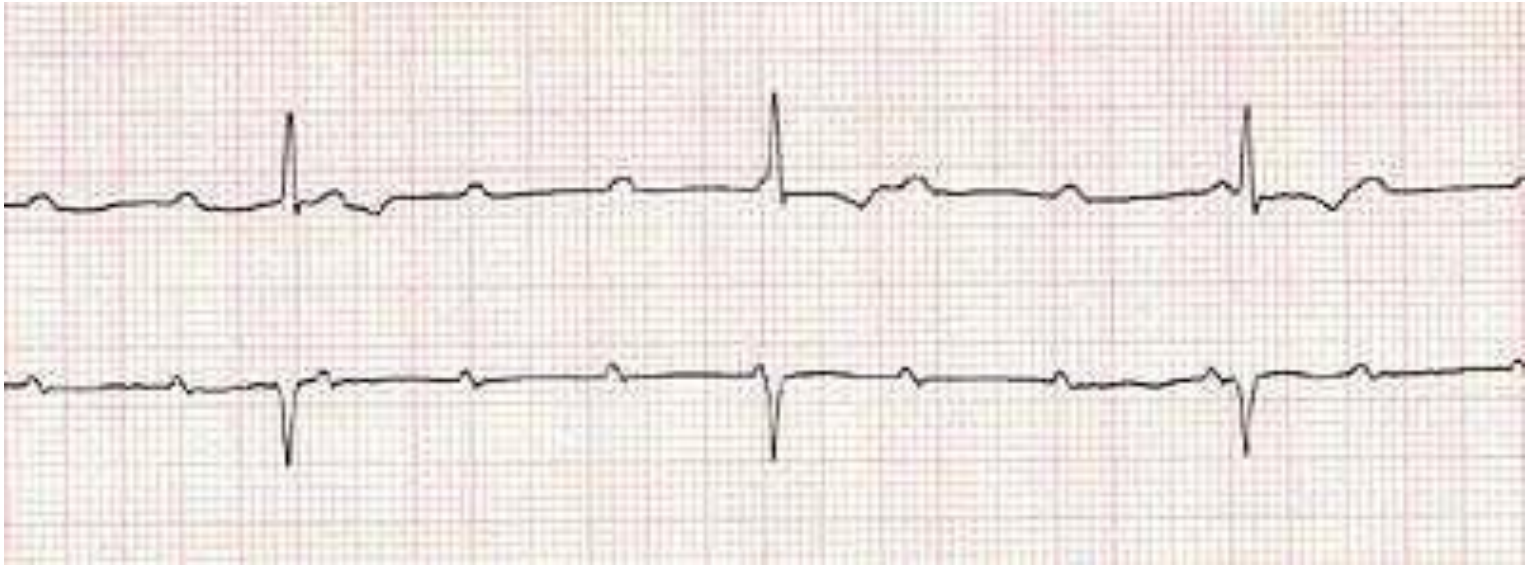
- Stop rate lowering drugs
- Refer to Cardiology OP
- Needs permanent pacemaker

*

What is this rhythm?

3rd degree heart block (complete)



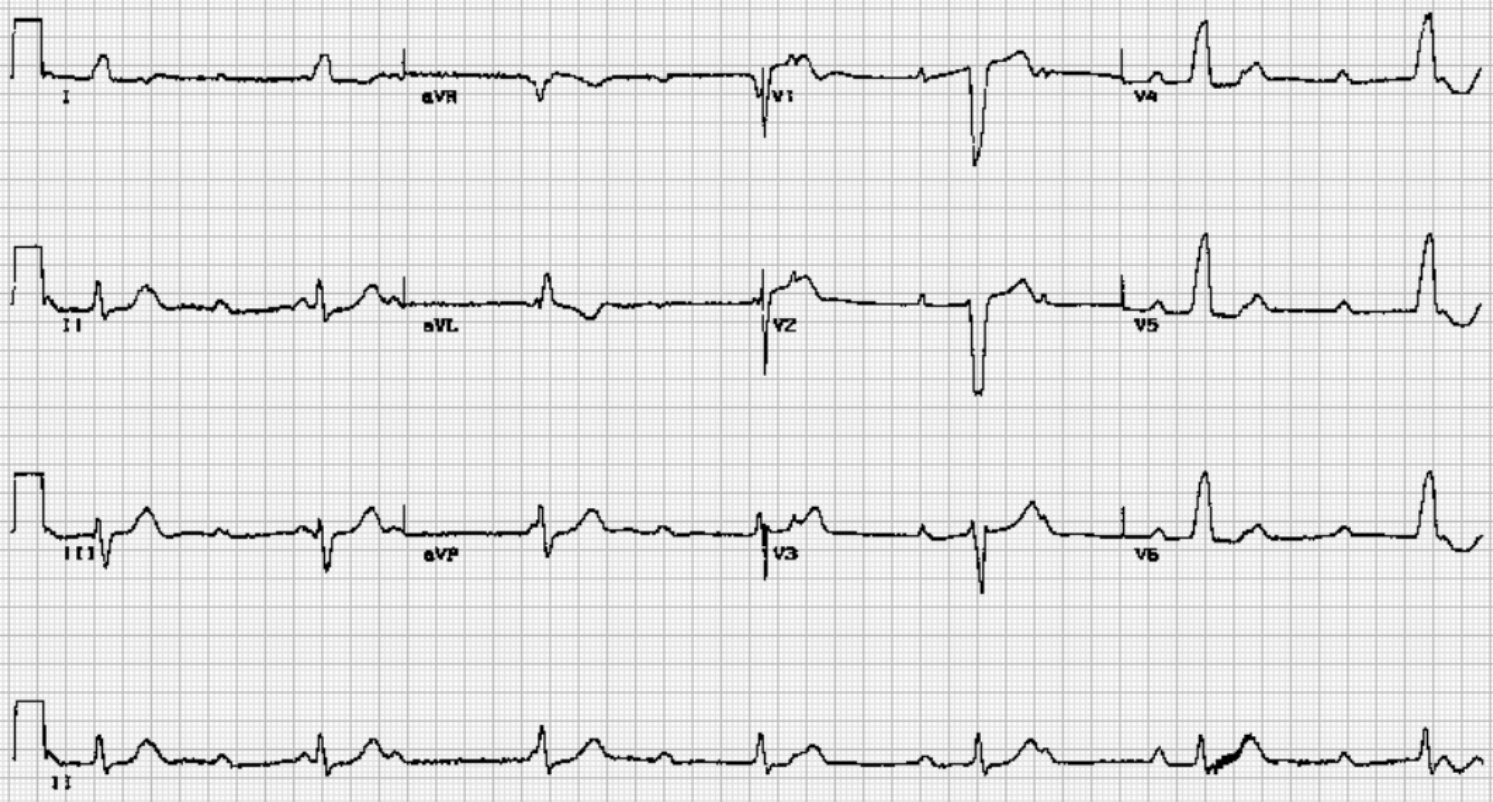


Scenario A
3rd degree AV Block

- Stop rate lowering drugs
- Refer to Cardiology for Urgent attention *

- Needs permanent pacemaker

A 70 year old man with exercise intolerance.



Complete Heart Block

- **P waves are not conducted to the ventricles because of block at the AV node. The P waves are indicated below and show no relation to the QR cycle but are never conducted**

24 hr BP-recordings ?

NICE guidelines ?

When using ABPM to confirm a diagnosis of hypertension, ensure that at least two measurements per hour are taken during the person's usual waking hours (for example, between 08:00 and 22:00). Use the average value of at least 14 measurements taken during the person's usual waking hours to confirm a diagnosis of hypertension. **[2011]**

Overall successful readings

Successful Readings	64.1%
Afib	7.3%

Dip

24-hour Sys	1.2%
24-hour Dia	5.3%

Which recordings to use ?
Day time OR 24hr average ?
NICE daytime ?

Hourly Average (Standard deviation)

	Actual Awake / Asleep	Sys (SD)	Dia (SD)	Pulse (SD)	MAP	Afib	Valid readings
24-hour	07 ~ 07	140 (8)	80 (9)	71 (8)	93 (10)	3	41
Awake	07 ~ 22	140 (8)	82 (8)	75 (8)	93 (7)	3	32
Asleep	22 ~ 07	138 (10)	78 (10)	65 (5)	92 (13)	0	9

Date	Time	Sys	Dia	Pulse	MAP	Afib	Remark
27/02/2017	12:40	135	77	77	86		
27/02/2017	13:00	157	87	82	100		
27/02/2017	13:29	106	91	87	98		
27/02/2017	14:24	141	101	104	108	D	
27/02/2017	14:49	136	89	83	98		
27/02/2017	15:04	152	83	79	94		
27/02/2017	15:21	132	78	75	88		
27/02/2017	15:40	142	78	74	86		
27/02/2017	16:24	149	86	79	95		
27/02/2017	16:49	145	87	76	95		
27/02/2017	17:00	142	82	74	90		
27/02/2017	17:40	153	84	71	90		
27/02/2017	18:09	148	91	85	98		
27/02/2017	19:20	147	84	70	90		
27/02/2017	19:43	143	87	65	111		
27/02/2017	20:00	133	79	69	118		
27/02/2017	20:29	145	89	69	98		
27/02/2017	20:44	148	84	64	90		
27/02/2017	21:04	138	89	67	94	D	
27/02/2017	21:20	156	91	70	98		
27/02/2017	21:40	156	96	70	114		
27/02/2017	22:08	132	66	65	92		
27/02/2017	23:01	143	74	67	93		
28/02/2017	00:03	140	85	65	91		
28/02/2017	01:00	145	87	61	105		
28/02/2017	02:00	139	80	59	110		
28/02/2017	03:00	145	73	60	78		

Night BP load (% of night readings ≥ 120/70 mmHg)

Awake	78.1%
Asleep	100.0%

Successful readings – significance?

Overall successful readings

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27/02/2017	19:20	147	84	70	90		
27/02/2017	19:43	143	87	65	111		
27/02/2017	20:00	133	79	69	118		
27/02/2017	20:29	145	89	69	98		
27/02/2017	20:44	148	84	64	90		
27/02/2017	21:04	138	89	67	94	D	
27/02/2017	21:20	156	91	70	98		
27/02/2017	21:40	156	96	70	114		
27/02/2017	22:08	132	66	65	92		
27/02/2017	23:01	143	74	67	93		

Overall successful readings

Successful Readings	64.1%
Afib	7.3%

Dip

24-hour Sys	1.2%
24-hour Dia	5.3%

Day time/Night time dips- signifigance?

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Overall successful readings

Successful Readings	64.1%
Afib	7.3%

Afib- significance ?

Dip

24-hour Sys	1.2%
24-hour Dia	5.3%

Hourly Average (Standard deviation)

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27/02/2017	16:24	149	86	79	95		
27/02/2017	16:49	145	87	76	95		
27/02/2017	17:00	142	82	74	90		
27/02/2017	17:40	153	84	71	90		
27/02/2017	18:09	148	91	85	98		
27/02/2017	19:20	147	84	70	90		
27/02/2017	19:43	143	87	65	111		
27/02/2017	20:00	133	79	69	118		
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28/02/2017	02:00	139	80	59	110		
28/02/2017	03:00	145	73	60	78		

Day and night perioc	Time	Interval
Day Period	15 ~ 16	20 min
Night Period	16 ~ 15	60 min

Day BP load (% of day readings ≥ 135/85 mmHg)

Night BP load (% of night readings ≥ 120/70 mmHg)

Awake	0.0%
Asleep	90.9%

Overall successful readings

Successful Readings	88.9%
Afib	12.5%

Dip

24-hour Sys	-5.7%
24-hour Dia	-3.1%

Hourly Average (Standard deviation)

	Actual Awake / Asleep	Sys (SD)	Dia (SD)	Pulse (SD)	MAP	Afib	Valid readings
24-hour	15 ~ 15	132 (15)	78 (10)	77 (8)	90 (12)	3	24
Awake	15 ~ 16	126 (--)	76 (--)	89 (--)	89 (--)	1	2
Asleep	16 ~ 15	133 (15)	78 (10)	76 (8)	90 (12)	2	22

Date	Time	Sys	Dia	Pulse	MAP	Afib	Remark
19/10/2016	10:03	159	96	84	108		
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19/10/2016	13:04	132	71	77	84		
19/10/2016	15:24	124	76	85	84		
19/10/2016	15:41	127	75	93	93	D	
19/10/2016	17:08	149	91	81	100		
19/10/2016	18:00	144	87	85	98		
19/10/2016	19:00	134	75	78	109		
19/10/2016	20:08	103	57	75	67		
19/10/2016	21:00	111	61	77	71		
19/10/2016	22:04	118	74	74	96	D	
19/10/2016	23:03	116	72	70	87		
20/10/2016	00:03	126	66	62	74		
20/10/2016	01:03	128	78	70	87		
20/10/2016	02:00	144	80	74	88		
20/10/2016	03:00	132	81	71	89		
20/10/2016	04:00	117	81	66	85		
20/10/2016	05:00	122	64	63	72		
20/10/2016	06:00	141	80	72	87		
20/10/2016	07:00	147	87	74	106		
20/10/2016	08:00	141	83	80	93		
20/10/2016	09:00	133	81	84	89		
20/10/2016	10:00	164	92	78	102		

Sex : Male
Age : 28
DOB [redacted]

Day and Night Period

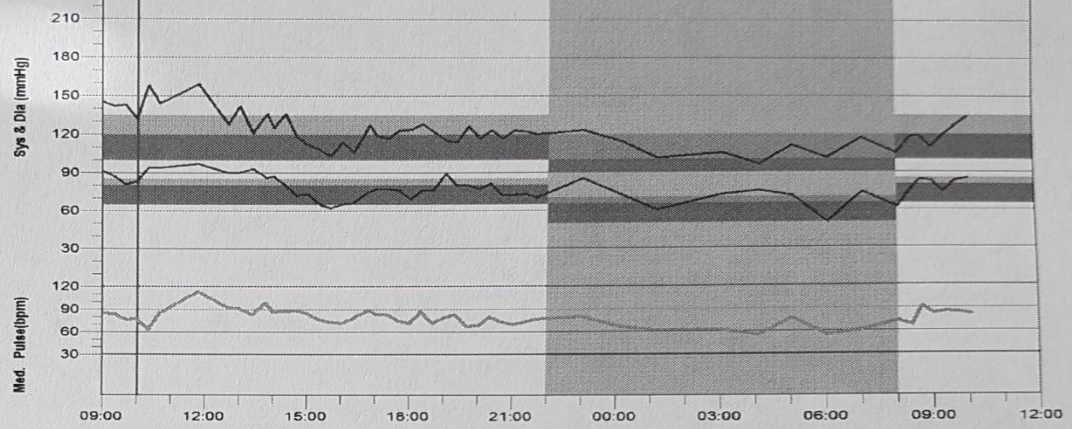
	Time	Interval
Day :	08 ~ 22	20 min
Night :	22 ~ 08	60 min

Actual Awake / Asleep

Awake : 08 ~ 22 h
Asleep : 22 ~ 08 h

BP Threshold

Day : 135/85 mmHg
Night : 120/70 mmHg



Readings

Total Readings : 57
Successful : 50 (87.7%)
Afib : 8 (16.0%)

BP Load

Day readings ≥ 135/85 **33.3%**
Night readings ≥ 120/70 **75.0%**

Average Blood Pressure (SD)

	Sys	Dia	HR	MAP	PP	Afib
24-hr	121 (15)	77 (10)	76 (13)	87 (11)	44	8(50)
Awake	127 (13)	81 (9)	82 (10)	90 (10)	46	6(42)
Asleep	109 (9)	70 (11)	65 (9)	80 (10)	39	2(8)

White Coat Window

	Sys	Dia	HR
Readings	4	4	4
1st hr Max	145	91	85

Night-time Dip%

	Sys	Dia
Dip%	14.4	13.3

Date / Time	Sys	Dia	HR	MAP	Afib
30/06/2016					
09:03	145	91	85	100	
09:20	142	87	84	94	
09:40	143	81	76	89	
10:00	132	83	77	89	
10:20	158	94	63	101	D
10:40	144	94	85	108	
11:49	159	97	113	107	
12:40	128	90	92	100	
13:00	142	90	91	114	
13:24	121	93	83	101	
13:48	136	86	98	94	
14:00	125	87	86	96	
14:20	136	80	87	88	
14:40	118	72	88	78	
15:00	112	73	85	81	
15:20	108	65	76	74	D
15:40	103	62	73	72	
16:00	114	65	71	71	D
16:20	106	66	77	75	
16:49	127	75	89	92	
17:00	119	77	83	84	
17:20	117	77	83	85	D
17:40	123	76	75	91	
18:01	124	69	71	75	
18:21	128	76	86	80	
18:40	122	76	71	87	
19:03	115	89	79	99	
19:20	114	80	82	93	
19:40	126	80	67	86	
20:00	117	77	68	86	
20:21	123	81	80	93	
20:41	117	72	73	78	D
21:00	123	72	70	82	
21:20	122	73	72	84	
21:41	120	70	76	78	
23:00	123	85	80	93	
01/07/2016					
00:09	114	72	66	85	
01:08	101	60	62	69	
03:00	105	72	62	80	
04:04	96	75	55	86	D
05:00	111	71	77	81	D
06:00	101	50	55	63	
07:00	117	74	61	85	
08:00	105	62	73	72	
08:24	118	76	67	84	
08:41	119	84	91	92	
09:00	110	83	82	95	D
09:20	119	74	85	80	
09:40	126	83	84	89	
10:04	134	85	81	103	

Interpretation
Day time OR 24hr average ?
Day time/Night time dips?
Successful readings?
Afib?
White coat ?

Comments:

24-h Normotension, Daytime Normotension, Isolated Nighttime Diastolic Hypertension, White Coat Hypertension, Dipper

Sex : Male
Age : 47
DOB [redacted]

Day and Night Period

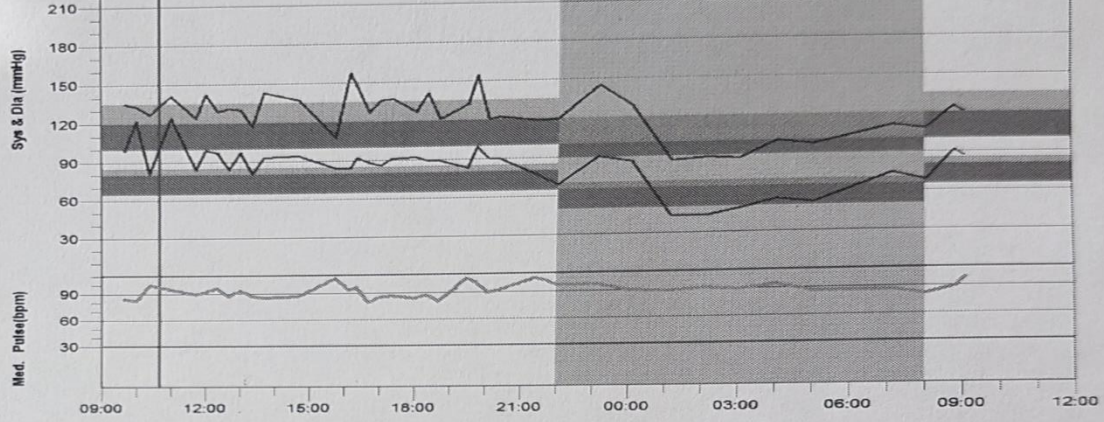
	Time	Interval
Day :	08 ~ 22	20 min
Night :	22 ~ 08	60 min

Actual Awake / Asleep

Awake : 08 ~ 22 h
Asleep : 22 ~ 08 h

BP Threshold

Day : 135/85 mmHg
Night : 120/70 mmHg



Readings

Total Readings : 52
Successful : 39 (75.0%)
Afib : 8 (20.5%)

BP Load

Day readings ≥ 135/85 **70.0%**
Night readings ≥ 120/70 **44.4%**

Average Blood Pressure (SD)

	Sys	Dia	HR	MAP	PP	Afib
24-hr	121 (18)	80 (19)	91 (6)	89 (18)	41	8(39)
Awake	129 (10)	90 (8)	92 (7)	99 (8)	39	8(30)
Asleep	107 (21)	62 (18)	91 (4)	72 (18)	45	0(9)

White Coat Window

	Sys	Dia	HR
Readings	3	3	3
1st hr Max	135	122	100

Night-time Dip%

	Sys	Dia
Dip%	17.1	31.1

Date / Time	Sys	Dia	HR	MAP	Afib
01/Mar/2016					
09:40	135	99	84	112	
10:00	133	122	82	132	D
10:24	127	81	100	89	D
11:00	141	124	95	129	D
11:44	124	84	89	89	
12:01	142	99	92	109	
12:20	129	97	96	102	
12:40	131	84	87	87	
13:00	130	97	93	105	
13:21	117	80	87	83	
13:40	143	93	85	106	D
14:40	137	94	86	104	D
15:44	108	84	106	94	
16:09	157	84	93	93	
16:20	146	92	96	111	
16:40	127	88	79	95	
17:01	136	86	85	95	
17:21	137	91	86	109	
18:00	127	92	83	100	
18:20	141	89	87	97	
18:40	121	89	80	96	
19:29	132	83	105	92	D
19:44	154	99	101	109	D
20:04	120	90	89	94	D
20:20	122	90	91	101	
21:24	119	77	105	81	
21:41	119	73	102	83	
22:01	120	69	97	84	
23:08	145	90	97	102	
02/Mar/2016					
00:03	129	86	90	94	
01:08	86	43	88	56	
02:08	88	43	91	53	
03:00	87	48	89	57	
04:00	100	55	94	63	
05:00	97	52	86	59	
07:08	111	74	86	82	
08:03	108	68	81	73	
08:48	125	91	88	98	
09:04	121	87	98	93	

Interpretation
Day time OR 24hr average ?
Day time/Night time dips?
Successful readings?
Afib?
White coat ?

Comments:

Isolated 24-h Diastolic Hypertension, Isolated Daytime Diastolic Hypertension, Nighttime Normotension, Dipper

WatchBP® O3

Ambulatory Blood Pressure Measurement Report

Physician : dr ali

Patient ID : [redacted]
Name : [redacted]
Sex : Male
Age : 60
DOB [redacted]

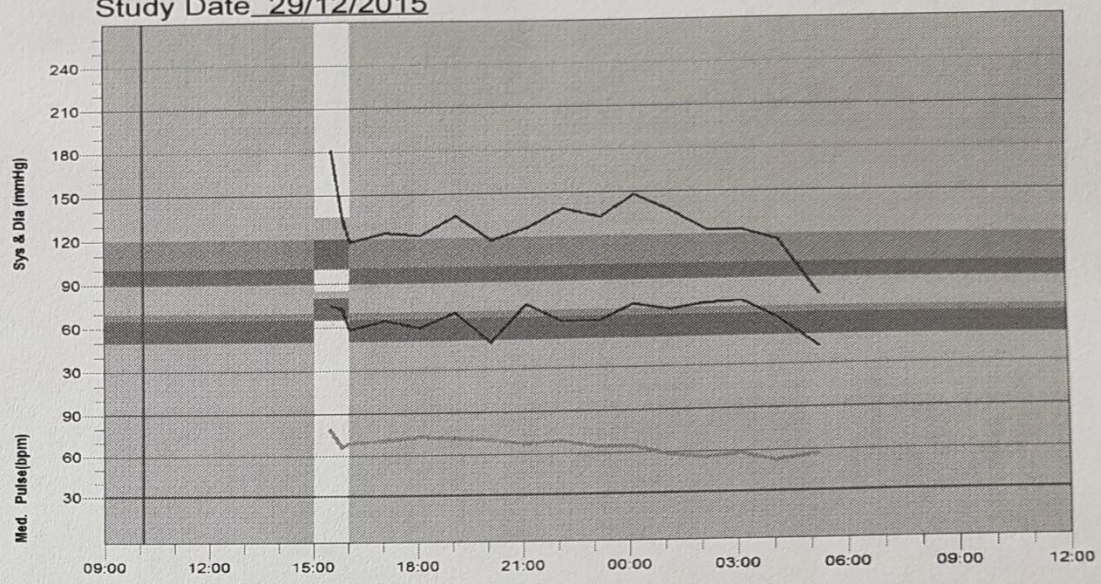
Day and Night Period

	Time	Interval
Day :	15 ~ 16	20 min
Night :	16 ~ 15	60 min

Actual Awake / Asleep
Awake : 15 ~ 16 h
Asleep : 16 ~ 15 h

BP Threshold
Day : 135/85 mmHg
Night : 120/70 mmHg

Study Date 29/12/2015



Readings
Total Readings : 27
Successful : 16 (59.3%)
Afib : 0 (0.0%)

BP Load
Day readings ≥ 135/85 **50.0%**
Night readings ≥ 120/70 **71.4%**

Average Blood Pressure (SD)

	Sys	Dia	HR	MAP	PP	Afib
24-hr	126 (18)	64 (10)	71 (8)	76 (13)	62	0(16)
Awake	157 (--)	74 (--)	80 (--)	96 (--)	83	0(2)
Asleep	124 (16)	64 (10)	70 (8)	74 (12)	60	0(14)

White Coat Window

	Sys	Dia	HR
Readings	0	0	0
1st hr Max	--	--	--

Night-time Dip%

	Sys	Dia
Dip%	20.8	13.6

Date / Time	Sys	Dia	HR	MAP	Afib
29/12/2015					
15:29	181	75	87	112	
15:48	133	72	72	80	
16:00	118	58	75	76	
17:00	124	64	77	71	
18:01	122	59	80	66	
19:01	135	69	79	78	
20:01	118	48	77	58	
21:00	126	74	73	82	
22:01	139	62	75	73	
23:04	133	62	70	74	
30/12/2015					
00:00	148	73	70	82	

Interpretation
Day time OR 24hr average ?
Day time/Night time dips?
Successful readings?
Afib?
White coat ?

WatchBP O3

Ambulatory Blood Pressure Measurement Report

Physician : dr ali

Patient ID : [redacted]
Name : [redacted]
Sex : Male
Age : 47
DOB : [redacted]

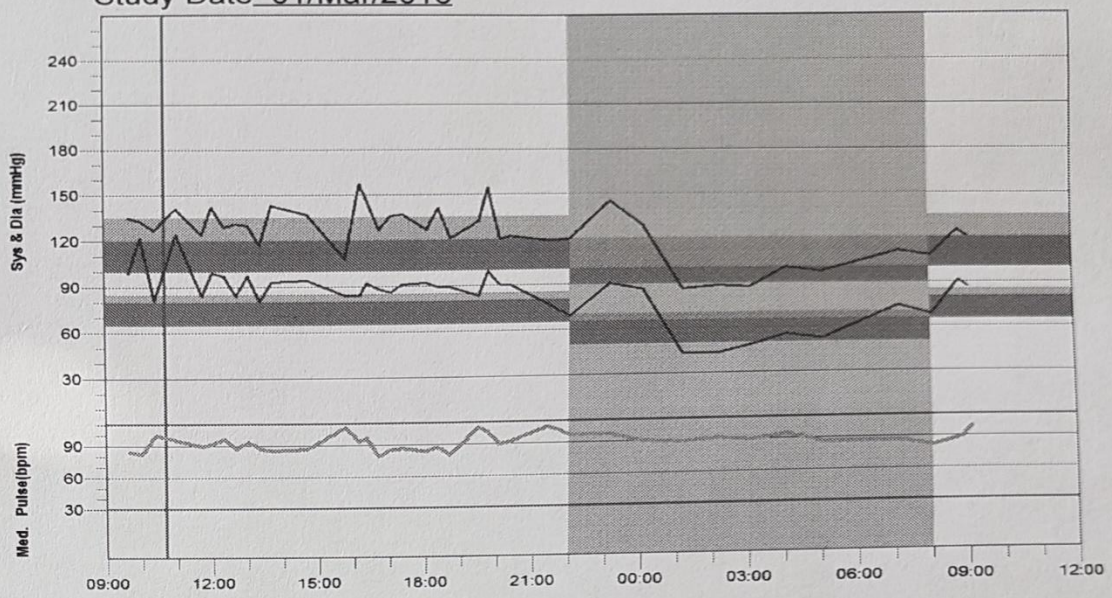
Day and Night Period

	Time	Interval
Day :	08 ~ 22	20 min
Night :	22 ~ 08	60 min

Actual Awake / Asleep
Awake : 08 ~ 22 h
Asleep : 22 ~ 08 h

BP Threshold
Day : 135/85 mmHg
Night : 120/70 mmHg

Study Date 01/Mar/2016



Readings
Total Readings : 52
Successful : 39 (75.0%)
Afib : 8 (20.5%)

BP Load
Day readings ≥ 135/85 **70.0%**
Night readings ≥ 120/70 **44.4%**

Average Blood Pressure (SD)

	Sys	Dia	HR	MAP	PP	Afib
24-hr	121 (18)	80 (19)	91 (6)	89 (18)	41	8(39)
Awake	129 (10)	90 (8)	92 (7)	99 (8)	39	8(30)
Asleep	107 (21)	62 (18)	91 (4)	72 (18)	45	0(9)

White Coat Window

	Sys	Dia	HR
Readings	3	3	3
1st hr Max	135	122	100

Night-time Dip%

	Sys	Dia
Dip%	17.1	31.1

Date / Time	Sys	Dia	HR	MAP	Afib
01/Mar/2016					
09:40	135	99	84	112	
10:00	133	122	82	132	D
10:24	127	81	100	89	D
11:00	141	124	95	129	D
11:44	124	84	89	89	
12:01	142	99	92	109	
12:20	129	97	96	102	
12:40	131	84	87	87	
13:00	130	97	93	105	
13:21	117	80	87	83	
13:40	143	93	85	106	D
14:40	137	94	86	104	D
15:44	108	84	106	94	
16:09	157	84	93	93	
20:20	122	90	91	101	
21:24	119	77	105	81	
21:41	119	73	102	83	
22:01	120	69	97	84	
23:08	145	90	97	102	
02/Mar/2016					
00:03	129	86	90	94	
01:08	86	43	88	56	
02:08	88	43	91	53	
03:00	87	48	89	57	
04:00	100	55	94	63	
05:00	97	52	86	59	
07:08	111	74	86	82	
08:03	108	68	81	73	
08:48	125	91	88	98	

Interpretation
Day time OR 24hr average ?
Day time/Night time dips?
Successful readings?
Afib?
White coat ?

WatchBP O3

Ambulatory Blood Pressure Measurement Report

Physician : dr ali

Patient ID : [redacted]
Name : [redacted]
Sex : Female
Age : 65
DOB [redacted]

Day and Night Period

	Time	Interval
Day :	08 ~ 22	20 min
Night :	22 ~ 08	60 min

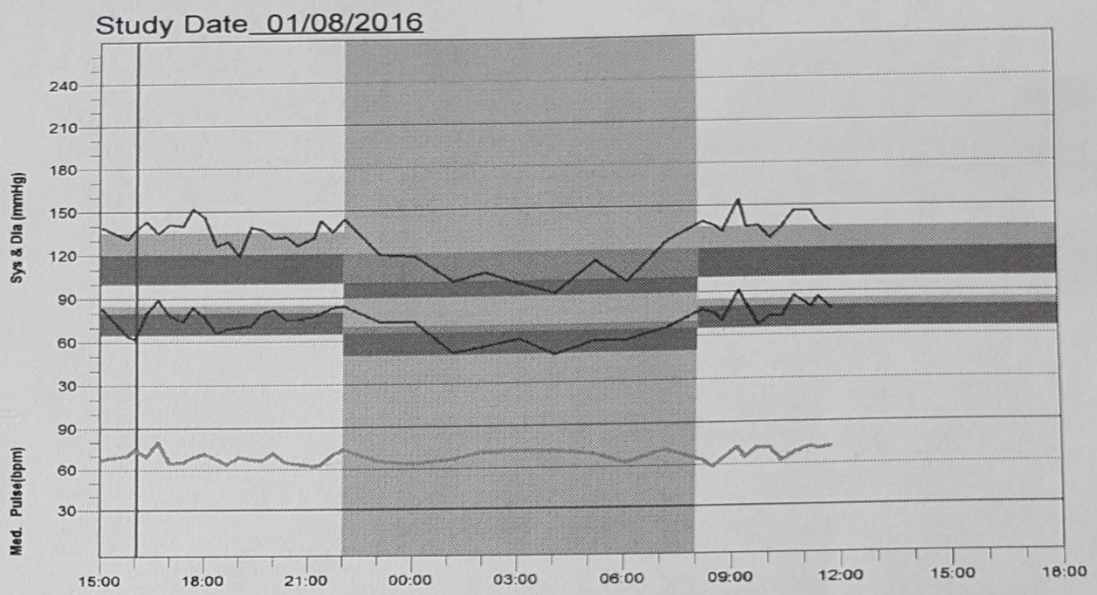
Actual Awake / Asleep

Awake : 08 ~ 22 h
Asleep : 22 ~ 08 h

BP Threshold

Day : 135/85 mmHg
Night : 120/70 mmHg

Study Date 01/08/2016



Readings

Total Readings : 43
Successful : 42 (97.7%)
Afib : 3 (7.1%)

BP Load

Day readings ≥ 135/85 **65.6%**
Night readings ≥ 120/70 **40.0%**

Average Blood Pressure (SD)

	Sys	Dia	HR	MAP	PP	Afib
24-hr	124 (17)	70 (11)	74 (4)	81 (11)	54	3(42)
Awake	136 (4)	77 (3)	74 (4)	86 (4)	59	3(32)
Asleep	111 (16)	63 (11)	75 (5)	74 (14)	48	0(10)

White Coat Window

	Sys	Dia	HR
Readings	3	3	3
1st hr Max	139	83	82

Night-time Dip%

	Sys	Dia
Dip%	18.4	18.2

Date / Time	Sys	Dia	HR	MAP	Afib
01/08/2016					
15:04	139	83	73	95	
15:49	131	64	77	70	
16:01	137	62	82	71	
16:21	143	80	76	87	
16:41	135	89	88	93	D
17:00	141	78	70	82	
17:24	140	74	71	81	
17:41	152	84	75	91	D
18:01	146	77	78	91	
18:20	126	66	74	75	
18:40	129	69	69	78	
19:01	119	70	75	77	

Date / Time	Sys	Dia	HR	MAP	Afib
01:09	100	51	72	57	
02:01	106	55	78	63	
03:01	98	60	79	66	
04:01	91	49	79	67	
05:09	113	58	76	70	
06:01	98	58	68	69	
07:09	126	66	78	74	
08:08	139	78	69	90	
08:29	136	75	63	84	
08:40	132	70	68	81	
09:08	154	91	79	112	D
09:20	135	81	70	89	
09:40	136	67	78	76	

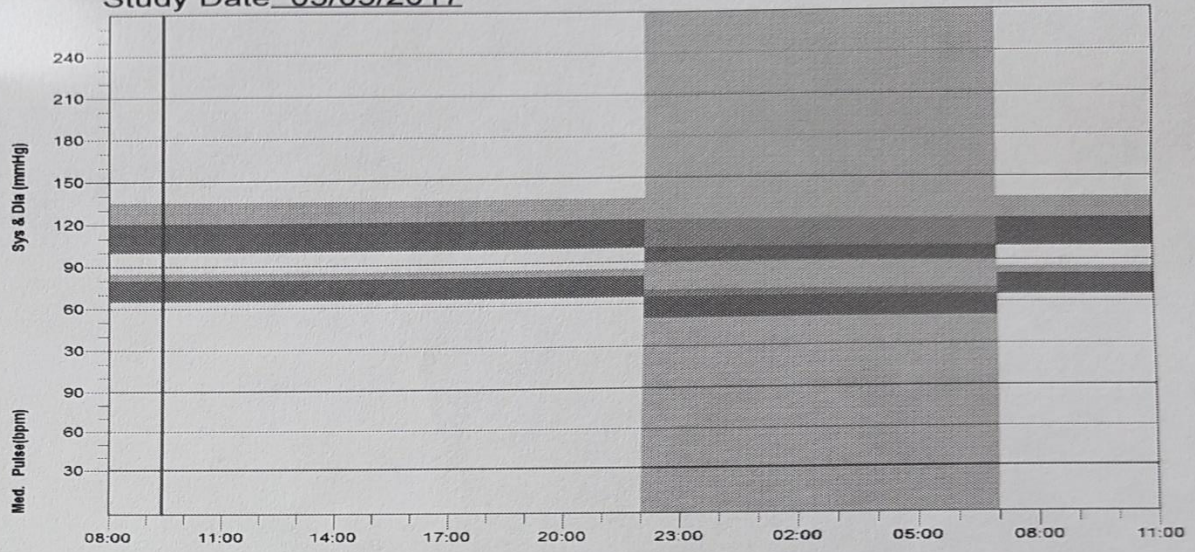
Interpretation
Day time OR 24hr average ?
Day time/Night time dips?
Successful readings?
Afib?
White coat ?

Patient ID :	[redacted]
Name :	[redacted]
Sex :	Male
Age :	61
DOB	[redacted]

Day and Night Period	Time	Interval
Day :	07 ~ 22	20 min
Night :	22 ~ 07	60 min

Actual Awake / Asleep	
Awake :	07 ~ 22 h
Asleep :	22 ~ 07 h

BP Threshold	
Day :	135/85 mmHg
Night :	120/70 mmHg



Readings	
Total Readings :	58
Successful :	42 (72.4%)
Afib :	4 (9.5%)

BP Load		
Day readings ≥	135/85	**70.6%**
Night readings ≥	120/70	**87.5%**

Average Blood Pressure (SD)	Sys	Dia	HR	MAP	PP	Afib
24-hr	134 (10)	73 (6)	68 (7)	86 (9)	61	4(42)
Awake	138 (8)	74 (5)	71 (6)	91 (6)	64	4(34)
Asleep	127 (11)	70 (6)	64 (5)	78 (8)	57	0(8)

White Coat Windo	Sys	Di
Readings	0	0
1st hr Max	--	--

Night-time Dip%	Sys	D
Dip%	7.6	6.

Date / Time	Sys	Dia	HR	MAP	Afib
05/05/2017					
08/05/2017					
09:00	130	83	68	91	
09:20	136	100	67	126	
09:44	163	66	62	69	D
10:01	161	75	73	77	
10:21	158	87	86	116	D
10:40	137	62	75	71	
11:00	143	69	68	96	
12:29	132	79	67	79	
12:43	115	66	67	83	
13:01	127	88	63	94	
13:23	138	74	64	96	
13:40	144	70	66	118	D
14:00	148	77	63	86	
14:28	132	74	63	80	
14:43	130	77	66	104	
15:00	126	61	73	80	
15:20	123	90	70	106	
15:40	151	82	75	90	
16:00	146	78	72	92	
16:28	121	76	62	97	
16:40	150	73	63	96	
17:24	161	79	72	86	
17:44	136	78	77	92	
18:43	127	66	75	89	
19:00	141	84	75	103	
19:20	136	73	73	99	
19:43	142	70	73	76	
20:00	152	77	73	115	
20:24	133	82	82	99	
20:49	137	71	67	78	
21:00	139	73	68	81	
21:20	137	75	72	86	
21:41	137	73	70	76	
22:00	136	78	67	88	
09/05/2017					
00:01	128	76	63	84	
01:01	121	60	70	67	
02:00	121	72	60	79	
03:01	110	69	61	76	
04:03	145	73	57	85	
05:08	125	69	59	78	
06:03	131	61	71	67	
07:04	126	63	83	83	D

Interpretation
Day time OR 24hr average ?
Day time/Night time dips?
Successful readings?
Afib?
White coat ?

Patient ID : [redacted]
Name : [redacted]
Sex : Female
Age : 51
DOB [redacted]

Day and Night Period

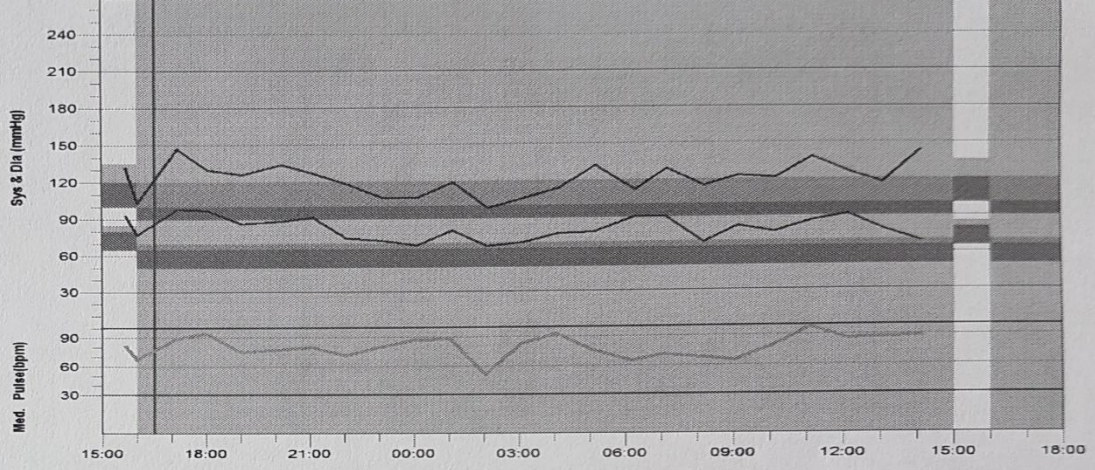
	Time	Interval
Day :	15 ~ 16	20 min
Night :	16 ~ 15	60 min

Actual Awake / Asleep

Awake : 15 ~ 16 h
Asleep : 16 ~ 15 h

BP Threshold

Day : 135/85 mmHg
Night : 120/70 mmHg



Readings

Total Readings : 25
Successful : 24 (96.0%)
Afib : 3 (12.5%)

BP Load

Day readings ≥ 135/85 **100.0%**
Night readings ≥ 120/70 **87.0%**

Average Blood Pressure (SD)

	Sys	Dia	HR	MAP	PP	Afib
24-hr	122 (13)	81 (10)	79 (11)	91 (9)	41	3(24)
Awake	132 (--)	93 (--)	81 (--)	101 (--)	39	0(1)
Asleep	121 (13)	81 (9)	79 (11)	91 (8)	40	3(23)

White Coat Window

	Sys	Dia	HR
Readings	2	2	2
1st hr Max	132	93	81

Night-time Dip%

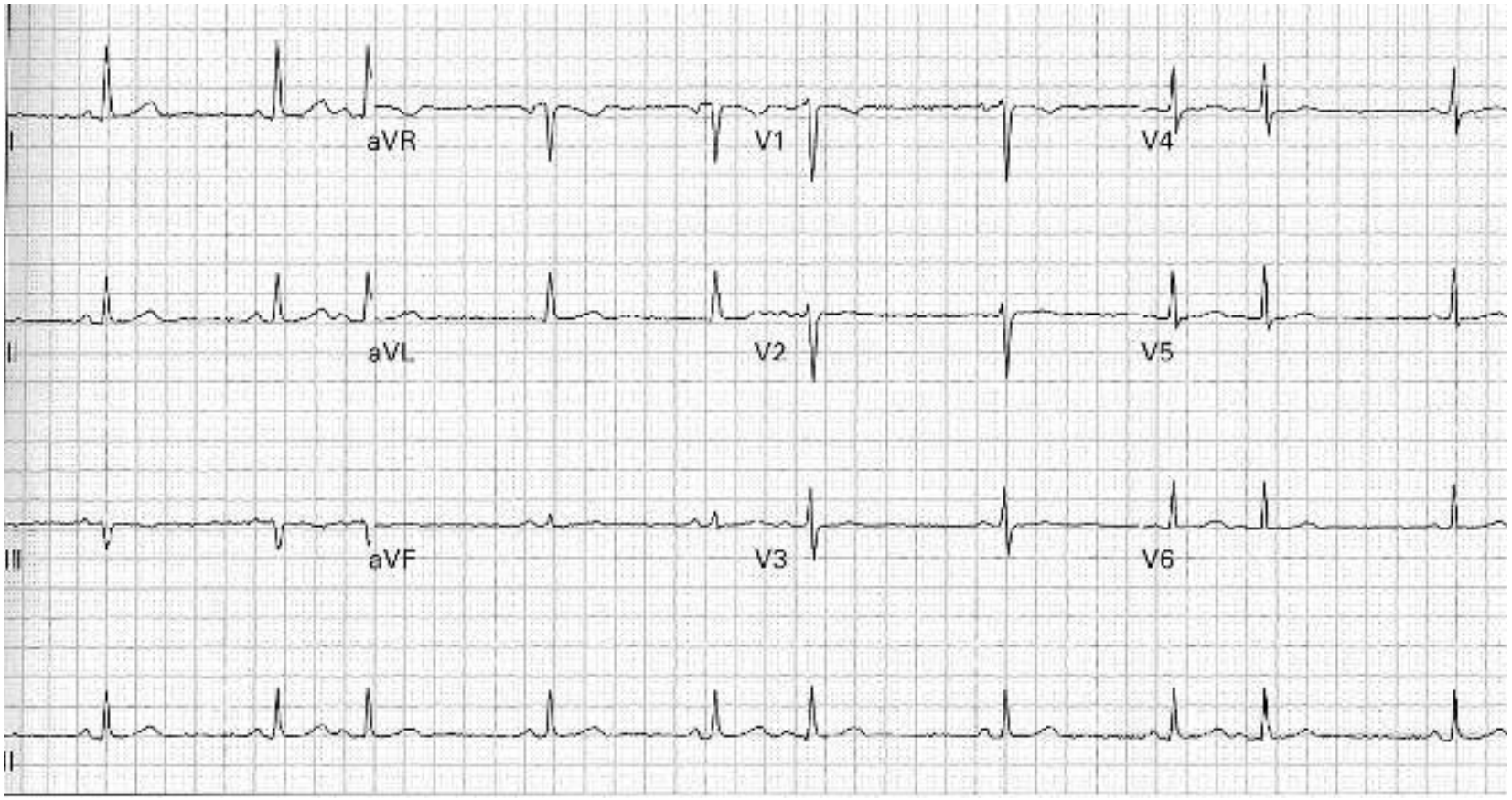
	Sys	Dia
Dip%	8.0	13.2

Date / Time	Sys	Dia	HR	MAP	Afib
13/10/2015					
15:41	132	93	81	101	
16:00	103	77	67	88	
17:10	147	98	89	105	
18:01	130	97	94	108	
19:01	126	86	75	91	
20:09	134	88	77	95	
21:03	127	91	80	106	
22:01	118	74	71	84	
23:01	107	72	80	82	
14/10/2015					
00:00	107	68	87	80	
01:01	119	80	88	86	
02:01	98	67	51	90	D
03:03	106	70	83	79	
04:00	114	77	93	95	
05:01	132	78	76	89	D
06:09	112	90	65	97	
07:01	129	90	71	98	
08:04	115	69	68	79	
09:01	123	82	65	88	
10:03	121	77	79	89	
11:04	138	86	98	88	
12:04	126	91	86	96	
13:01	117	79	87	89	
14:04	143	69	88	80	D

Comments:

Interpretation
Day time OR 24hr average ?
Day time/Night time dips?
Successful readings?
Afib?
White coat ?

76 year old male; T2DM on routine ECG - asymptomatic

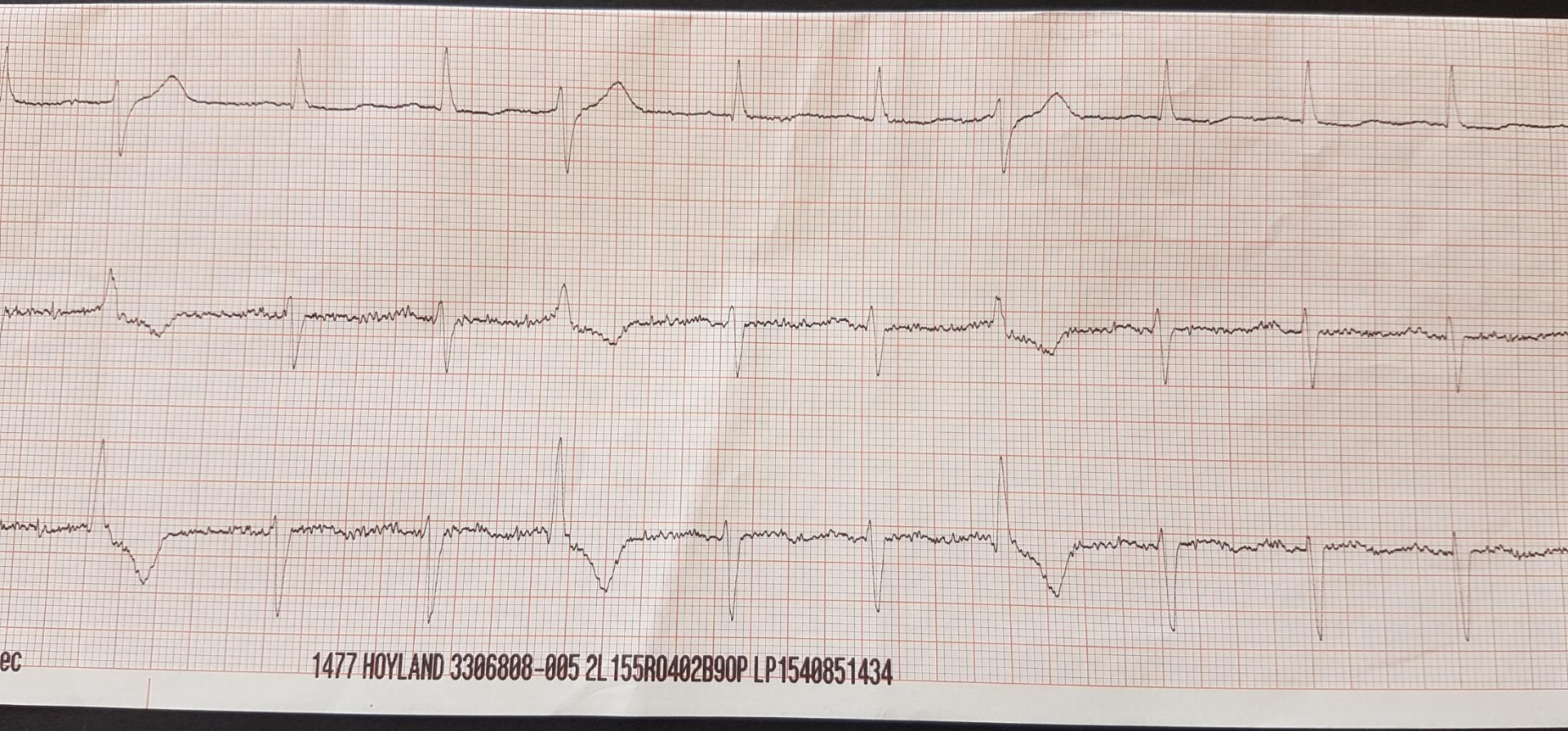


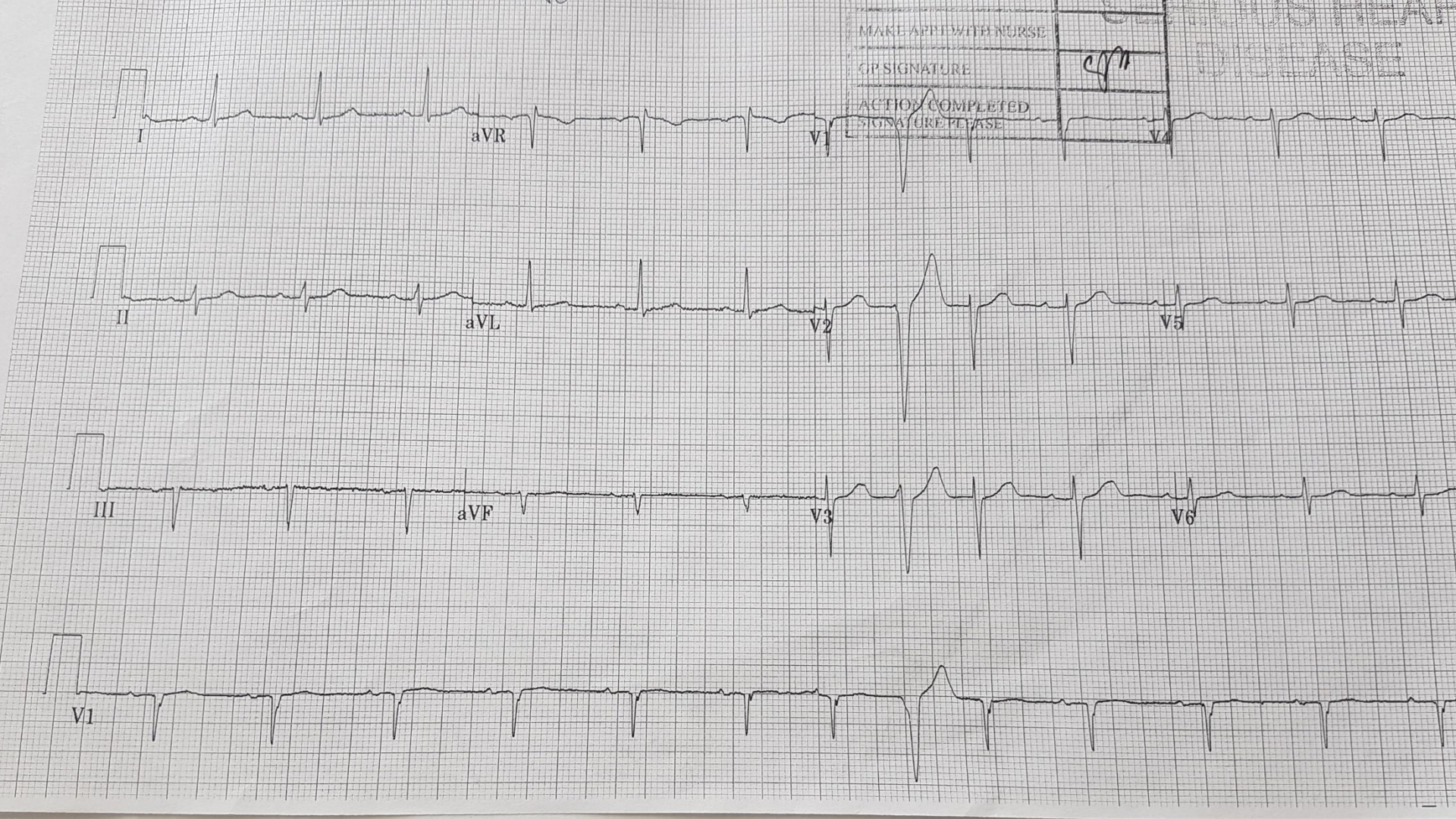
Premature Atrial Contractions Trigeminy pattern

76 year old male; MI in 2010; T2DM on routine ECG - asymptomatic

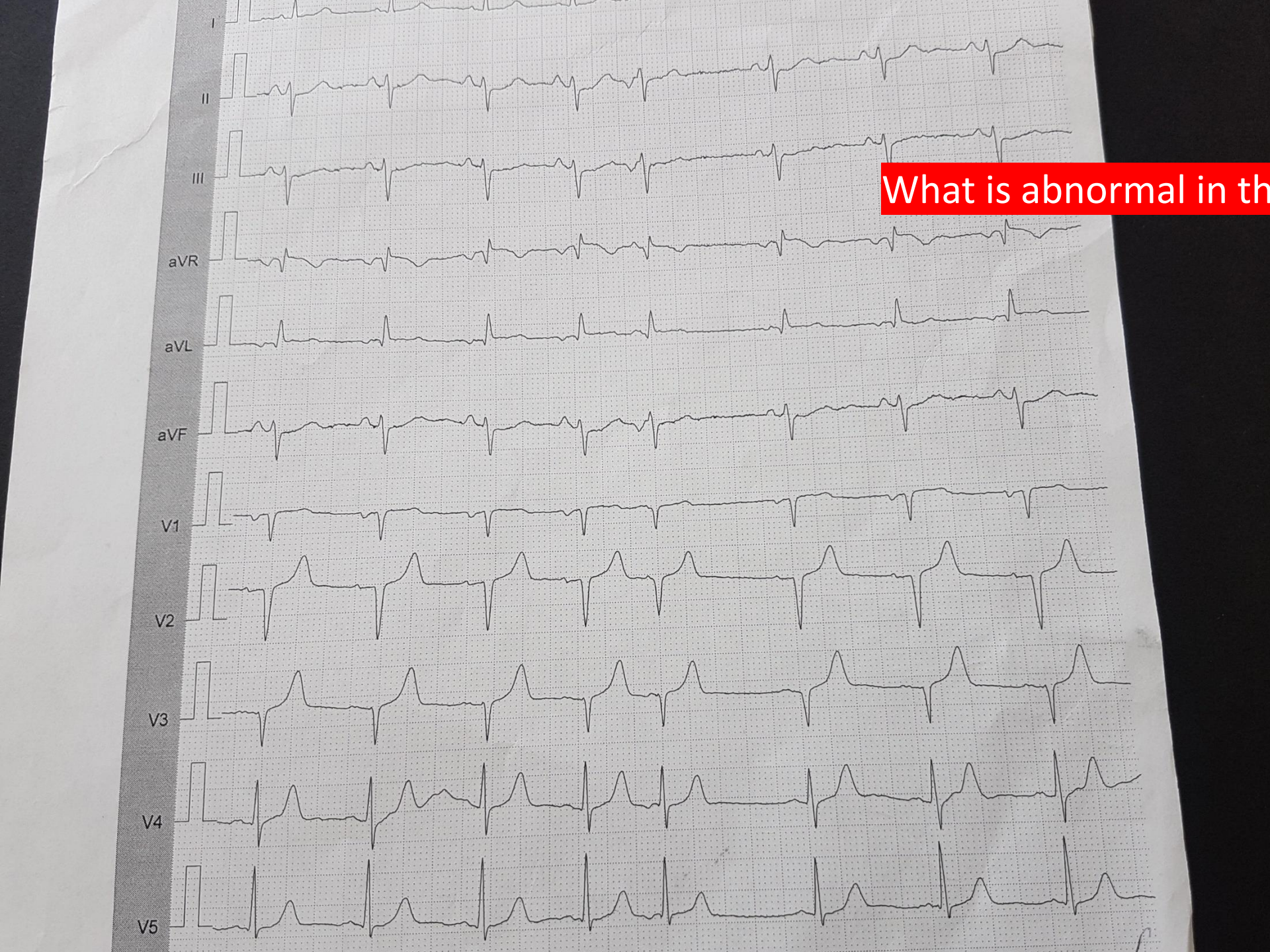
VENTRICULAR PREMATURE CONTRACTIONS – VPC

What is abnormal in this ECG?





What is abnormal in this ECG


I
II
III
aVR
aVL
aVF
V1
V2
V3
V4
V5
What is abnormal in th

Ectopics
Supraventricular/Ventriular

What to look out for
When to refer OPA
- routine/soon /admission
what doesn't need referring

What is normal variant?

- Infrequent
  - Atrial premature contractions
  - or Ventricular Premature Contractions

Normal Atrial Premature Contractions - Supraventricular premature beats (APBs) if:*

- isolated (< 200/min)
- < 5 salvos (or < 20%) of maximal three beats

Ventricular PBs (VPBs), if:

- isolated (< 200/24 h?)
- monomorphic
- isolated ‘couplets’ (<20/24 h?), instantaneous rate < 160/min

VENTRICULAR PREMATURE CONTRACTIONS – VPC

- The prognostic significance of VPCs is variable and, again, best interpreted in the context of the underlying cardiac condition.
- VPC prevalence rate of 41% in healthy teenage boys aged 14-16 years, 50-60% in healthy young adults, and 84% in healthy elderly persons aged 73-82 years.
- The Framingham heart study (with 1-h ambulatory ECG) suggested that the prevalence rate of 1 or more VPCs per hour was 33% in men **without coronary artery disease (CAD)** and 32% in women without CAD.
- Among patients **with CAD**, the prevalence rate of 1 or more VPCs was 58% in men and 49% in women
- VPCs also are common in patients with hypertension, ventricular hypertrophy, cardiomyopathy, and mitral valve prolapse.

VPCs – When to refer

- Frequent symptoms
  - especially bursts of sustained palpitations – **pls request 24 Hour Tape**
- Frequent VPCs on 24 hour monitor
  - >10% of all heartbeats (OR) 7 or more ventricular premature beats per minute
  - Post MI >10 / hour
  - ventricular bigeminy, ventricular trigeminy, ventricular couplets, ventricular triplets, sustained or nonsustained ventricular tachycardia,
  - Frequent VPCs during Exercise or Recovery

Summary so far :-
What is normal or normal variant?

- Sinus tachycardia: maximal rate about 110/min
- Sinus bradycardia: minimal rate about 45/min; minimal instantaneous rate during sleep about 35/min
- Isolated ventricular pauses <2 secs during sleep
- Infrequent APCs or VPCs
- 1st degree AV block in children and young adults
- Incomplete RBBB in children and young adults

A 79 year old man with 5 hours of chest pain.

When to refer Bund

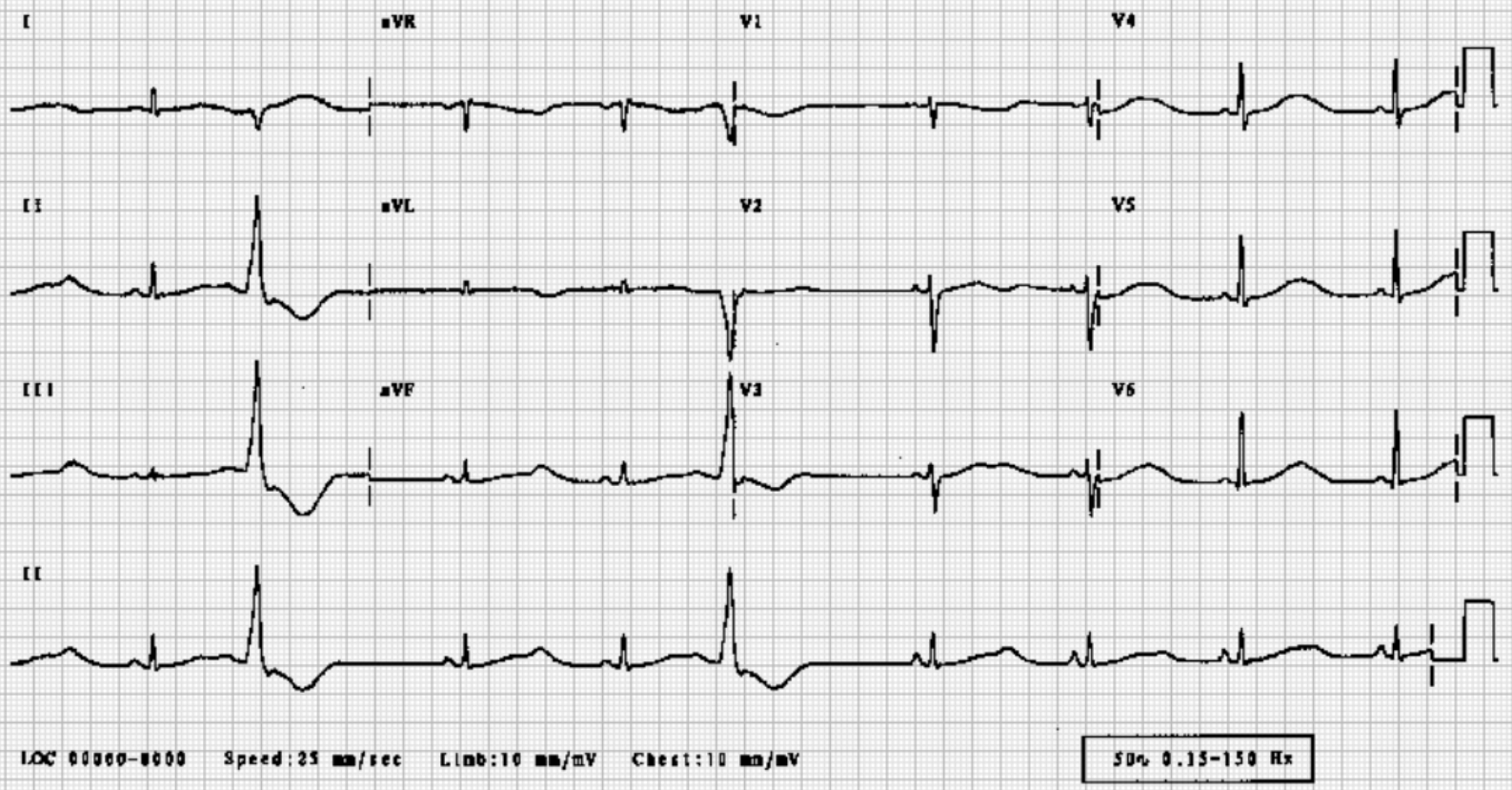
Acute myocardial infarction in the presence of left bundle branch block

Features suggesting acute MI

- ST changes in the *same* direction as the QRS (as shown here)
- ST elevation more than you'd expect from LBBB alone (e.g. > 5 mm in leads V1 - 3)
- Q waves in two consecutive lateral leads (indicating anteroseptal MI)

(ref. Sgarbossa EB et al, N Engl J Med 1996;334:481-7)

Go back to ECG homepage



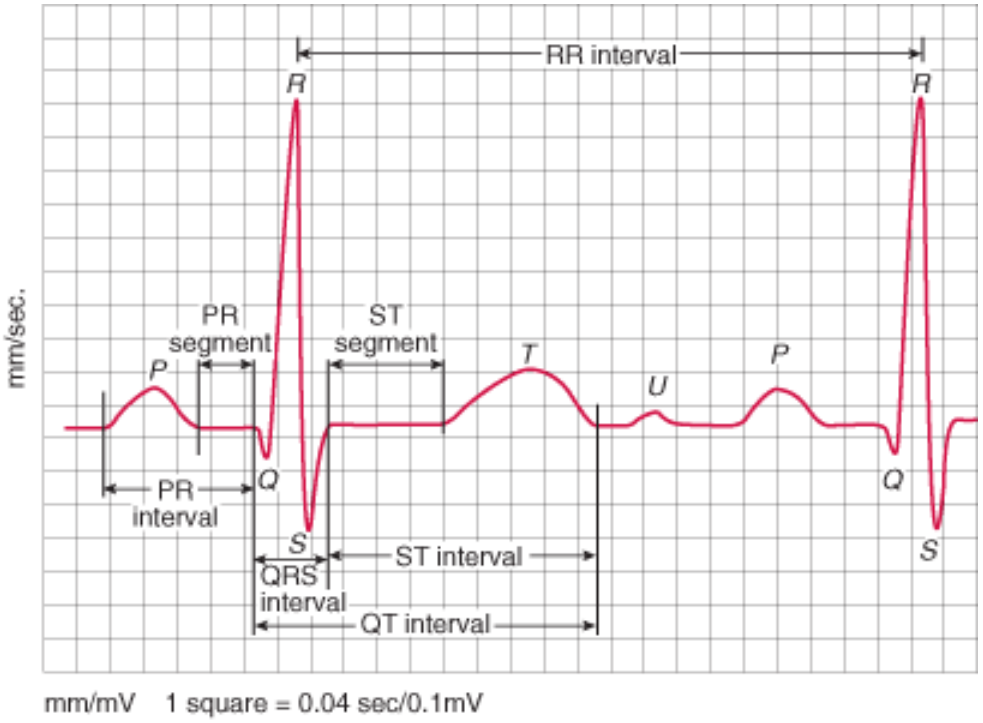
Long QT interval

- The QT interval normally varies with heart rate - becoming shorter at faster rates. It is usually corrected using the cycle length (R-R
  shown opposite.
- normal QTc = 0.42 seconds

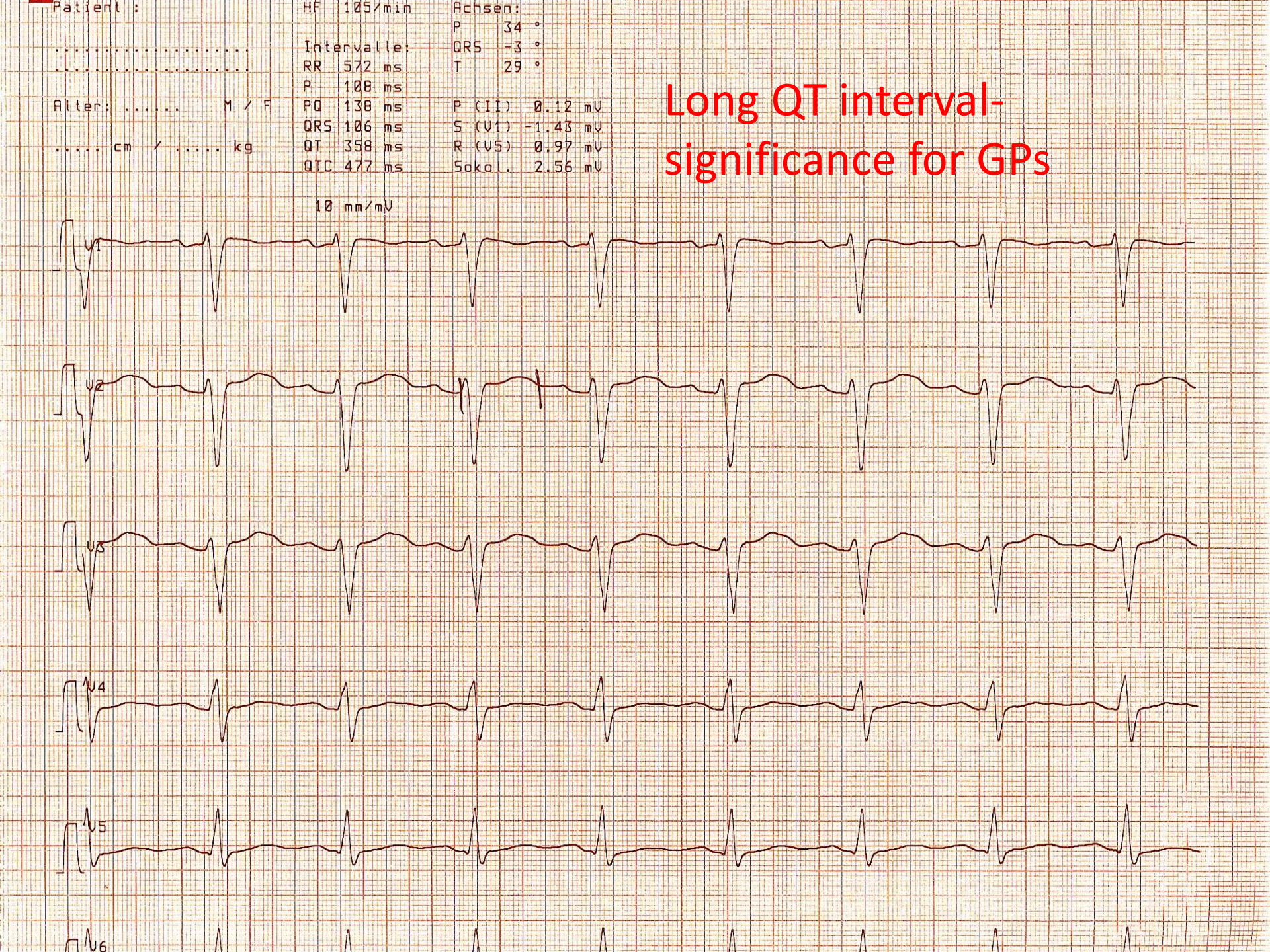
Romano-Ward syndrome is an autosomal dominantly inherited form of long QT interval and there is a risk of recurrent ventricular tachycardia,

Normal Intervals

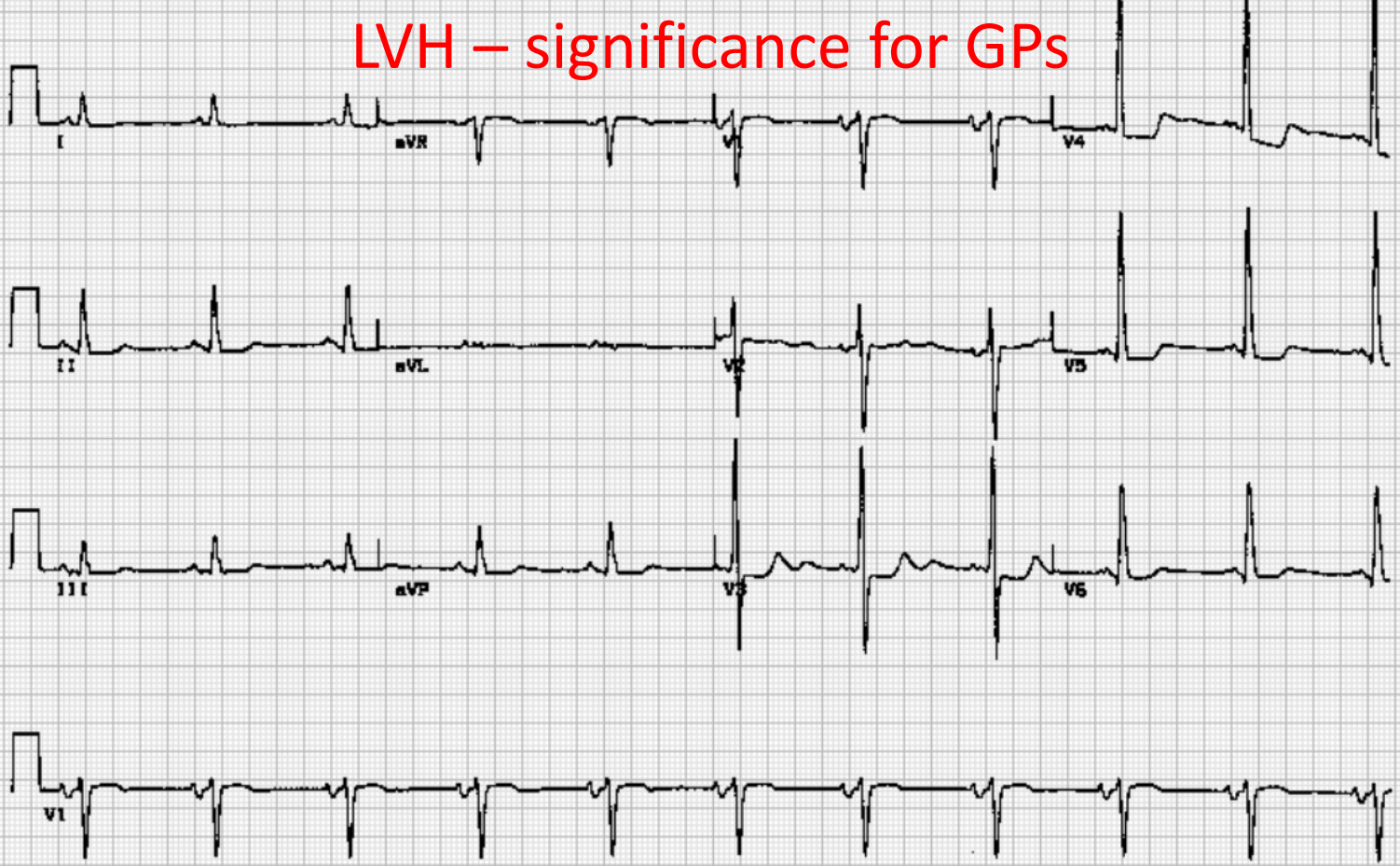
- PR
  - 0.20 sec (less than one large box)
- QRS
  - 0.08 – 0.10 sec (1-2 small boxes)
- QT
  - 450 ms in men,
  - 460 ms in women
  - Based on sex / heart rate
  - Half the R-R interval with normal HR



Long QT interval- significance for GPs



LVH – significance for GPs



Left ventricular hypertrophy (LVH)

There are many different criteria for LVH.

- **Sokolow + Lyon** *(Am Heart J, 1949;37:161)*
  - **S V1+ R V5 or V6 > 35 mm**
- **Cornell criteria** *(Circulation, 1987;3: 565-72)*
  - **SV3 + R avl > 28 mm in men**
  - **SV3 + R avl > 20 mm in women**

Echocardiography

When to request an echo ?

Re: [redacted]

This patient attended the POST MI clinic to see the Cardiology Clinical Nurse Specialist today

MI date: 07/11/2016.
Angiogram Report: PPCI, stent x2 RCA (proximal and mid).

ECHO : 08/11/2016
Limited views obtained.
Mildly reduced LV systolic function.
RV normal size, reasonable function.
Grossly normal valves.

Interpretation of results to GPs

PMH: MI and PCI 13 years ago, OA, Tonsillectomy and radiotherapy for squamous cell carcinoma.

BP: 134/78mmHg Pulse: 78bpm ECG: Sinus rhythm QRS: 78ms

U+E bloods: 28/11/16 Na: 136 K: 4.5 Creat: 83 Urea: 5.5

Chest pain: Initially post discharge had shortness of breath symptoms but doesn't feel he had pain symptoms. This is no longer a problem.

Breathing: SoB initially post discharge but now breathing is more comfortable.

Re: [redacted]

This patient attended the POST MI clinic to see the Cardiology Clinical Nurse Specialist today.

MI date: 04/04/17
Angiogram Report: PCI to LAD and Cx.

ECHO : 11/04/17
LV normal size, overall preserved systolic function, some inferior wall hypokinesis.
RV normal size with good function.
LA & RA normal size.
Mild MR, TR, trivial PR.
Estimated PASP 38-43mmHg.

Interpretation of results to GPs

PMH: TIA November 2016, ex-smoker (quit following MI April 2017).

BP: 134/60mmHg Pulse: 52bpm ECG: Sinus bradycardia QRS: 98ms

U+E bloods: 05/06/17 Na: 138 K: 4.4 Creat: 123 Urea: 6.7

Cholesterol: 4.4, Nov 2016. Will the GP please ensure these bloods are repeated and the cholesterol reading target should be 4.0 or below. Thank you.

Chest pain: No chest pain symptoms occurring since discharge. GTN spray not utilised.

Dear Dr A ALI

RE: [redacted]

I have received the result of echocardiogram which was performed on 7 November 2016.

The left ventricular size and wall thickness is normal and there is septal wall motion abnormality noted due to left bundle branch block pattern. Inferior region also appear hypokinetic and there is mild - moderate LV dysfunction. There is normal right ventricular chamber size and function and left atrium is mild - moderately dilated. There is no significant valvular abnormality and only mild aortic and trace of mitral and tricuspid regurgitation is noted.

Interpretation of results to GPs

In view of mild - moderate LV dysfunction I would be grateful if you could increase the Losartan dose to 50 mgs daily. The mild - moderate LV dysfunction on the echocardiogram should not prevent Mr Vickers from a planned surgical correction for dupuytren's contracture as he has no limiting breathlessness and occasional angina and is on appropriate medical therapy.

I shall arrange for further review in out patient clinic.

Yours sincerely

Cardiology queries ?
Who to contact ? How to contact

- ECG interpretation Queries
- Other cardiology queries
- Who to contact ?
- How to contact

Thankyou