



PACE OR NOT PACE?

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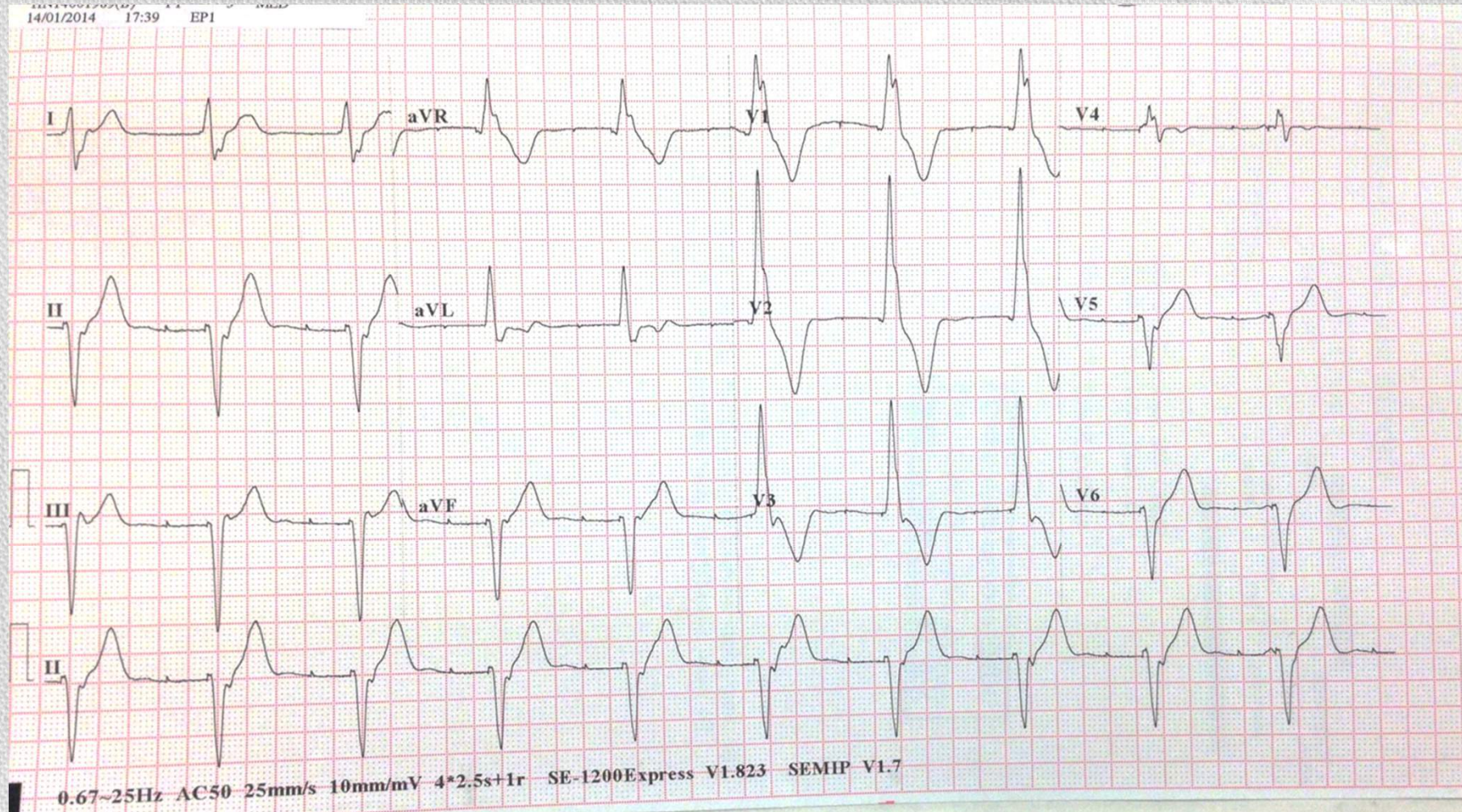
Specialist in Cardiology

PYNEH

4/2015

- 
- 69/F
 - Hx of SSS with DDDR done 3 months ago
 - Referred to our hospital for pacemaker assessment
 - Asymptomatic

ECG on first FU



- Normal or abnormal?



YOU NEED TO KNOW
WHAT IS NORMAL
BEFORE YOU CAN
APPRECIATE WHAT IS
ABNORMAL



Vocab

- Sensing
 - Under sensing
 - Over sensing
- Threshold
- Impedence
- Output
- Capture
- Fusion
- Pseudofusion
- Pacemaker nomenclature

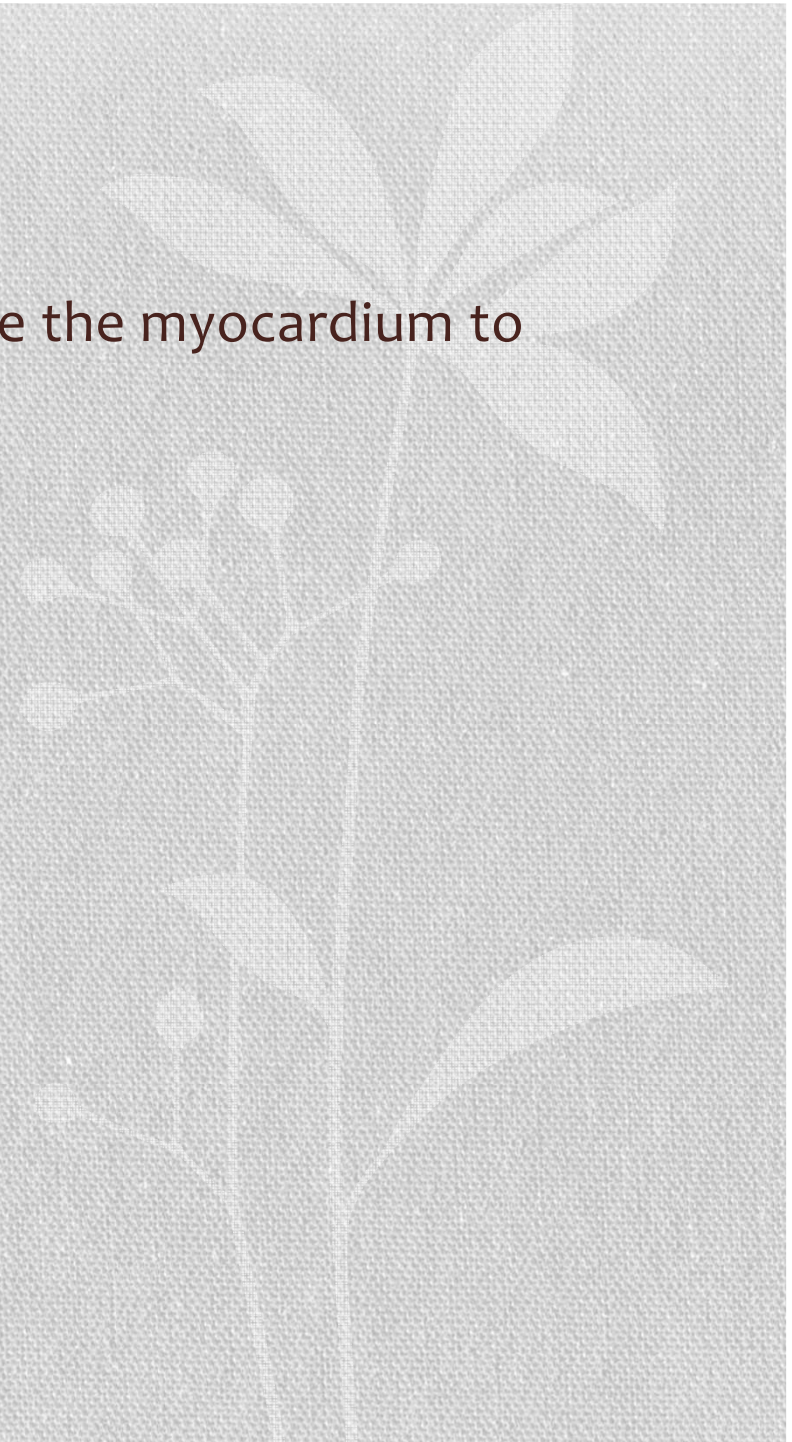


Sensing

- How pacemaker 'see' the P wave or R wave (depends on A lead or V lead)
 - Under-sensing
 - Just like 'blind' – not seeing any signal
 - Over-sensing
 - Like using microscope to see things – see too many signal even there's no actual signal

Threshold

- The minimal energy required to stimulate the myocardium to contract



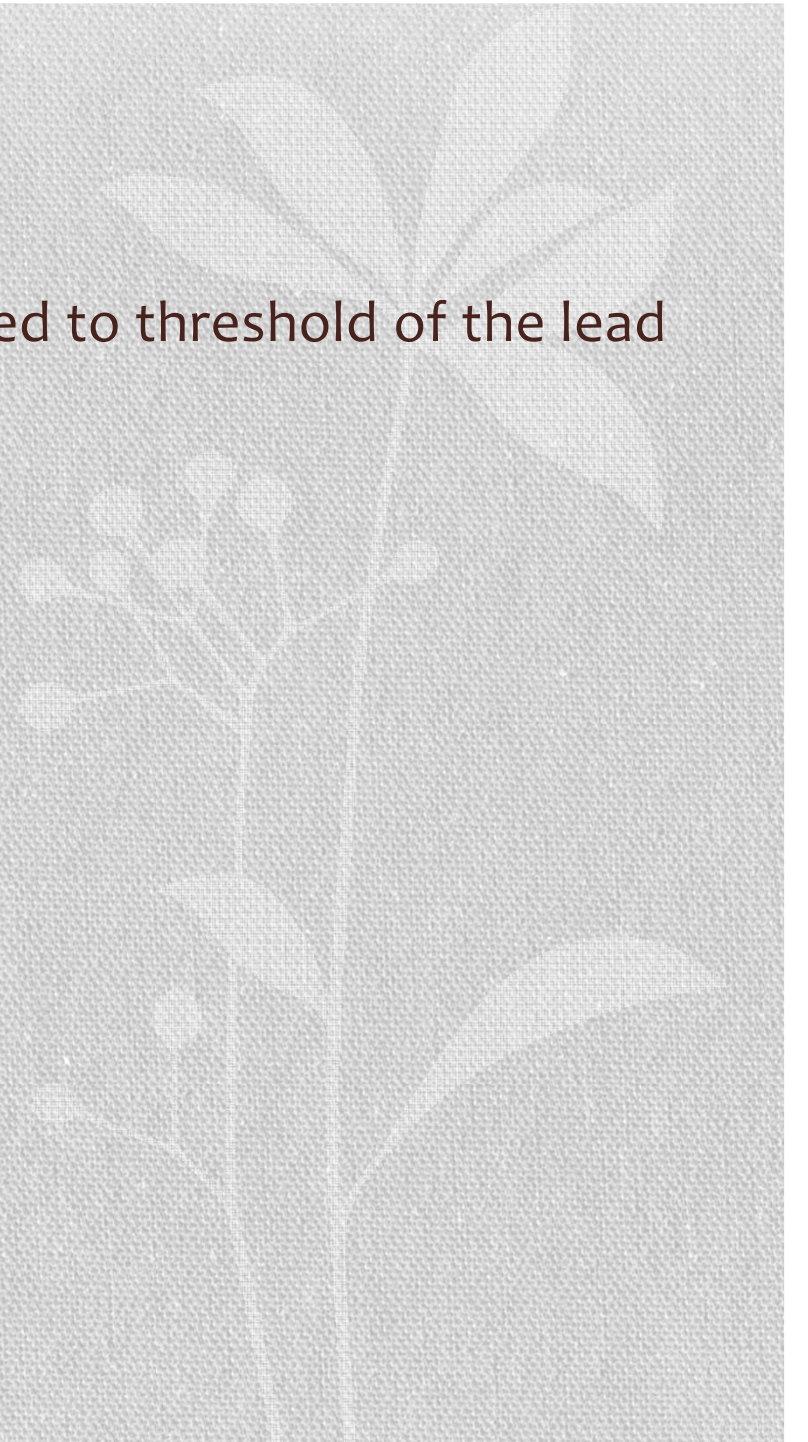
Impedence

- The intrinsic parameter of the lead, similar as resistance



Output

- The energy output from the pacer, related to threshold of the lead



Capture

- Capture means the output energy can successfully stimulate the myocardium to contract
- Non-capture means the output energy failed to stimulate the myocardium

Fusion

- Fusion means the output energy from pacer capture the chamber, at the same time there's intrinsic rhythm causing chamber contraction

Pseudofusion

- Pseudofusion means there's output energy from pacer, at the same time there's intrinsic rhythm causing chamber contraction, however, the output energy can't capture the chamber

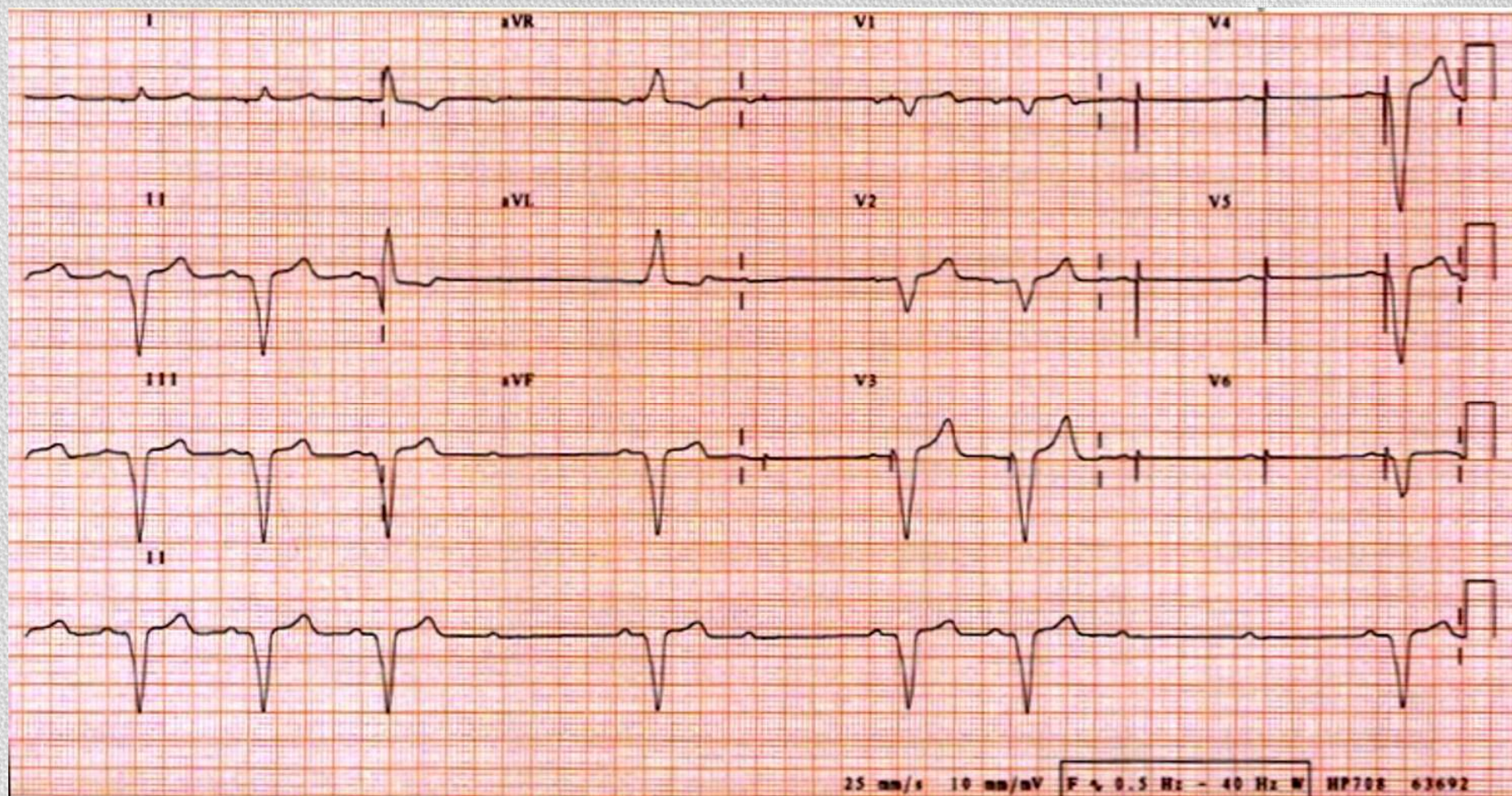
Pacemaker nomenclature

- Most of the model composite of four letters
 - First letter: what pacer see
 - Atrium/ ventricle/ dual chamber/ nothing
 - Second letter: where pacer pace
 - Atrium/ ventricle/ dual chamber/ nothing
 - Third letter: how pacer response
 - Trigger/ inhibit/ both response/ nothing
 - Four letter: any rate modulation function
 - Presence/ absence



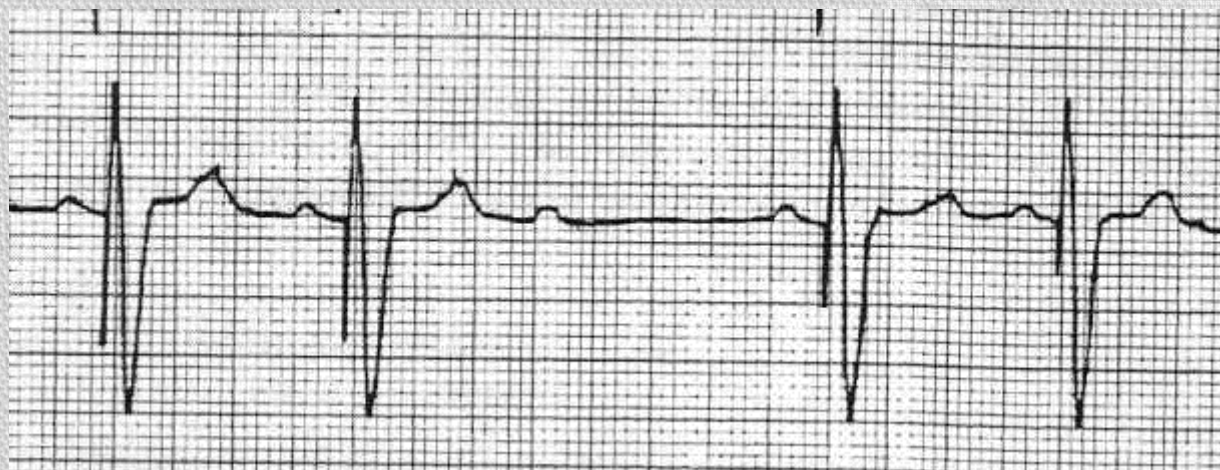
EXAMPLE

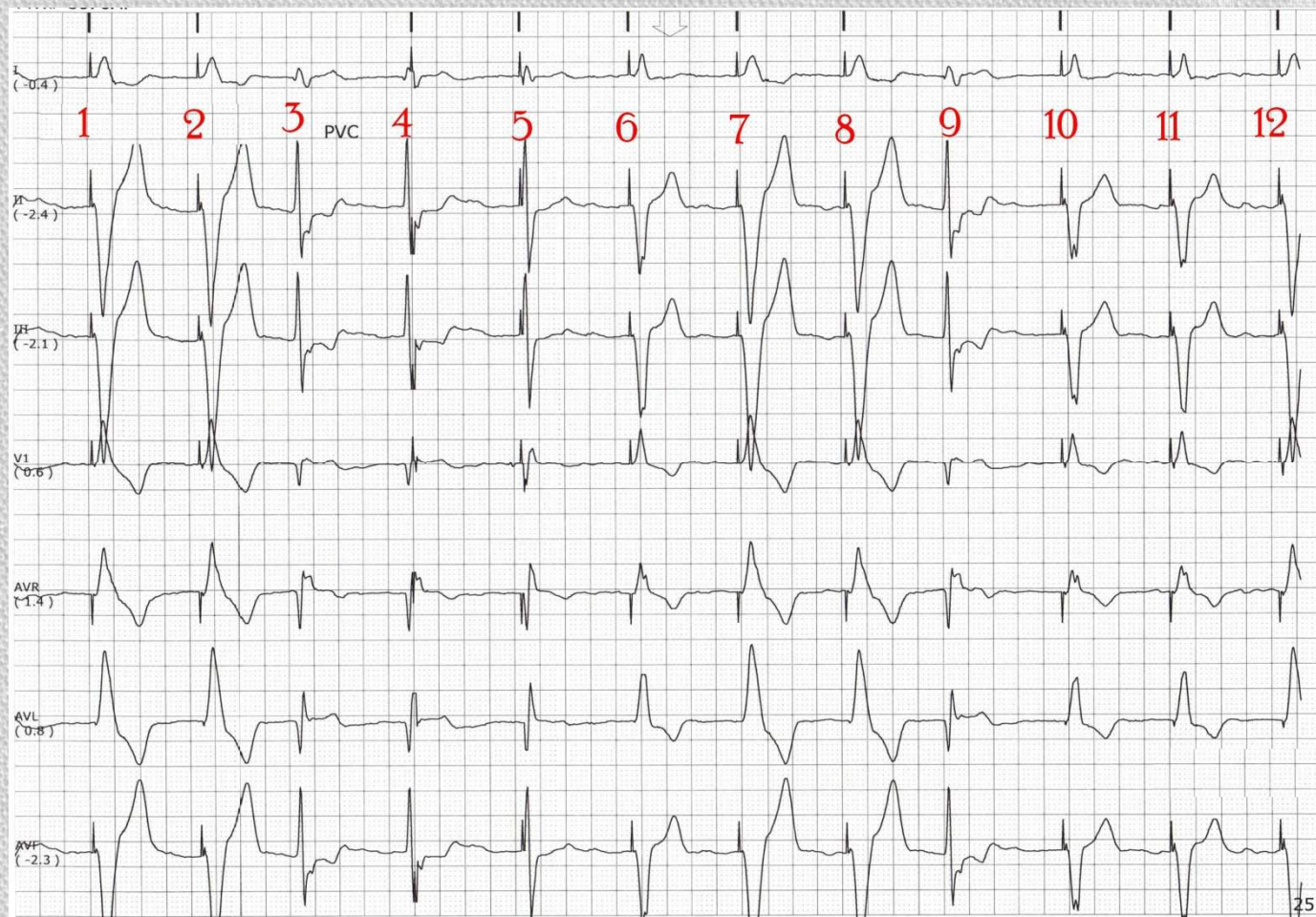








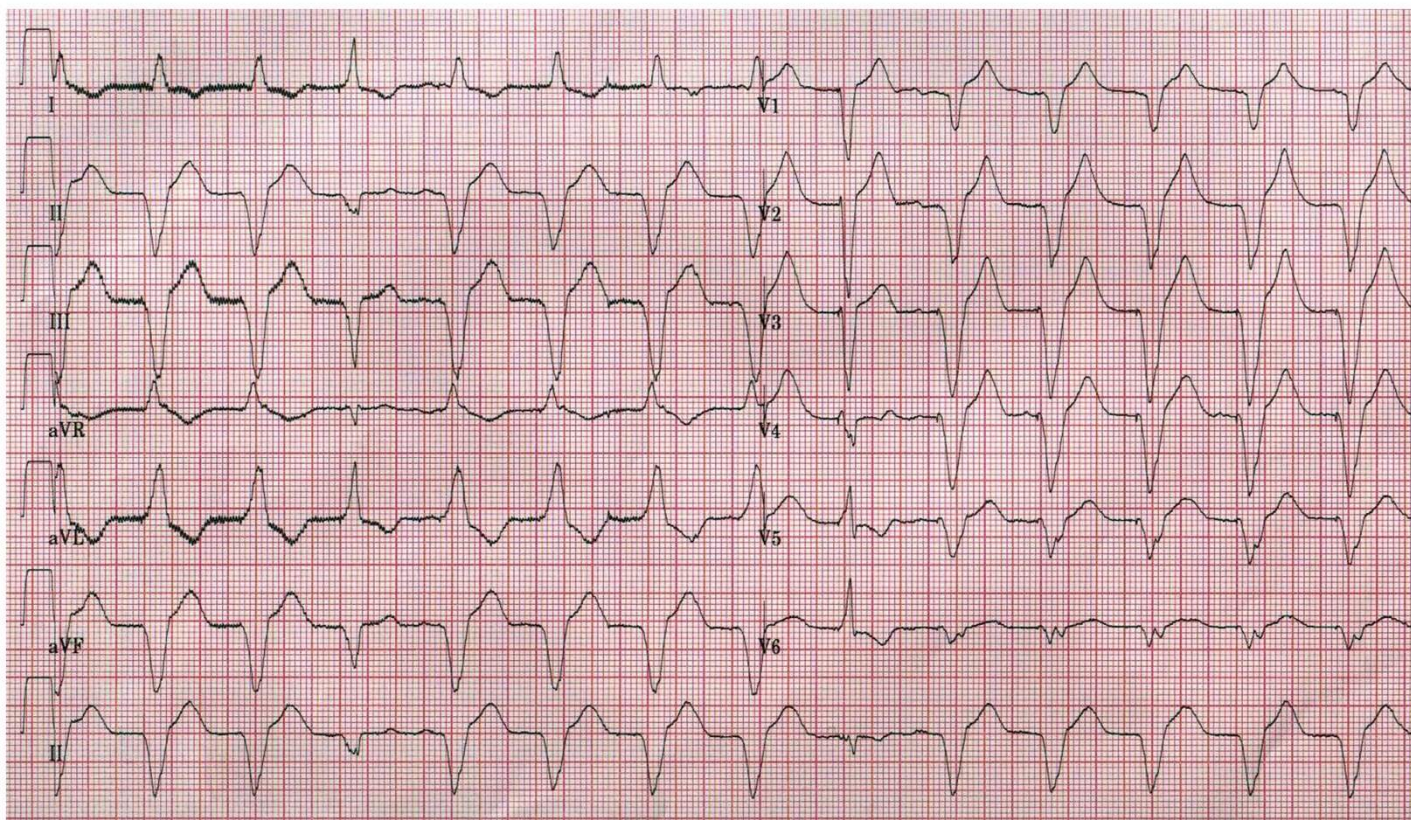




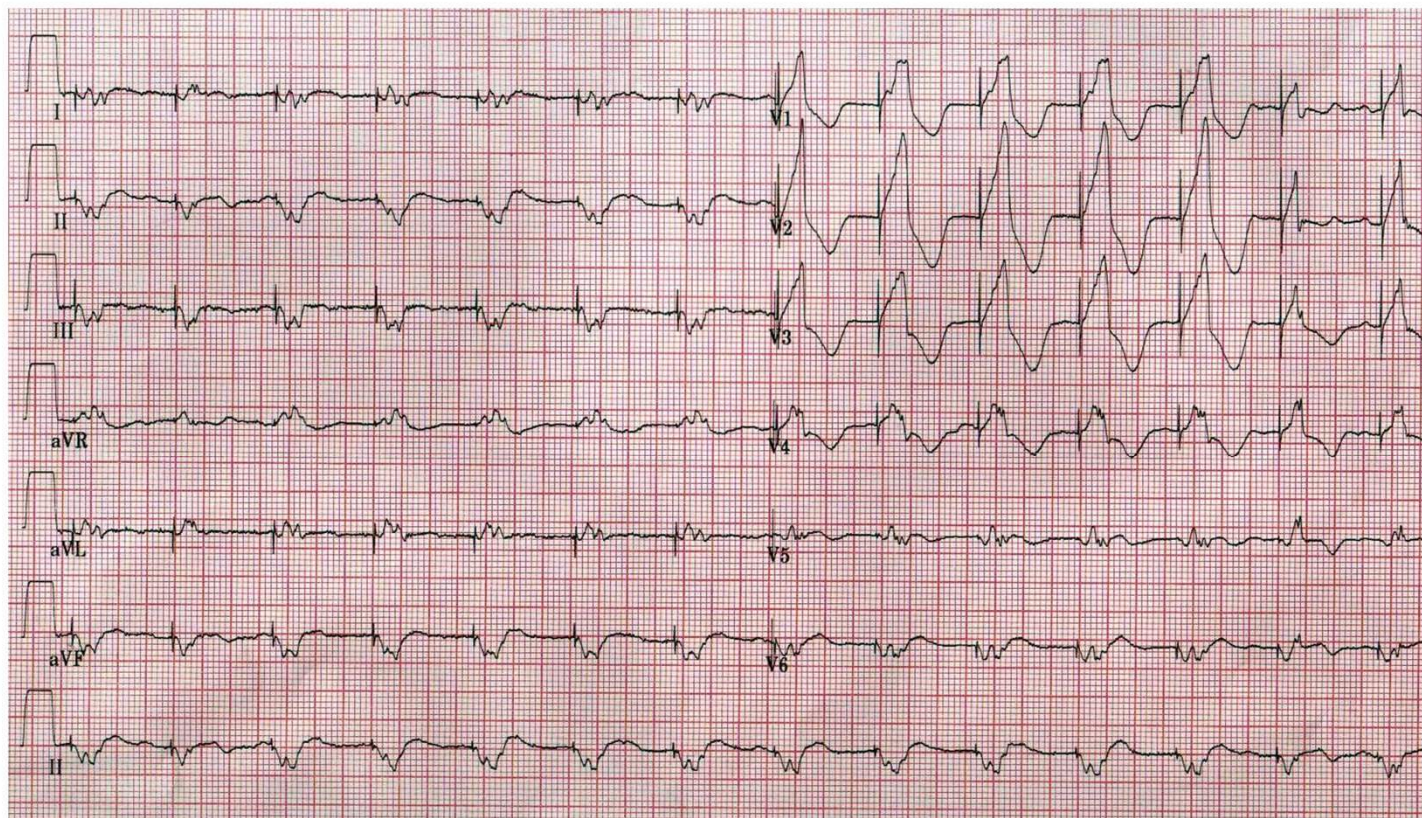


WHAT IS NORMAL?





Courtesy of Vincent de Rover, RN & Device Technician, AMC, The Netherlands



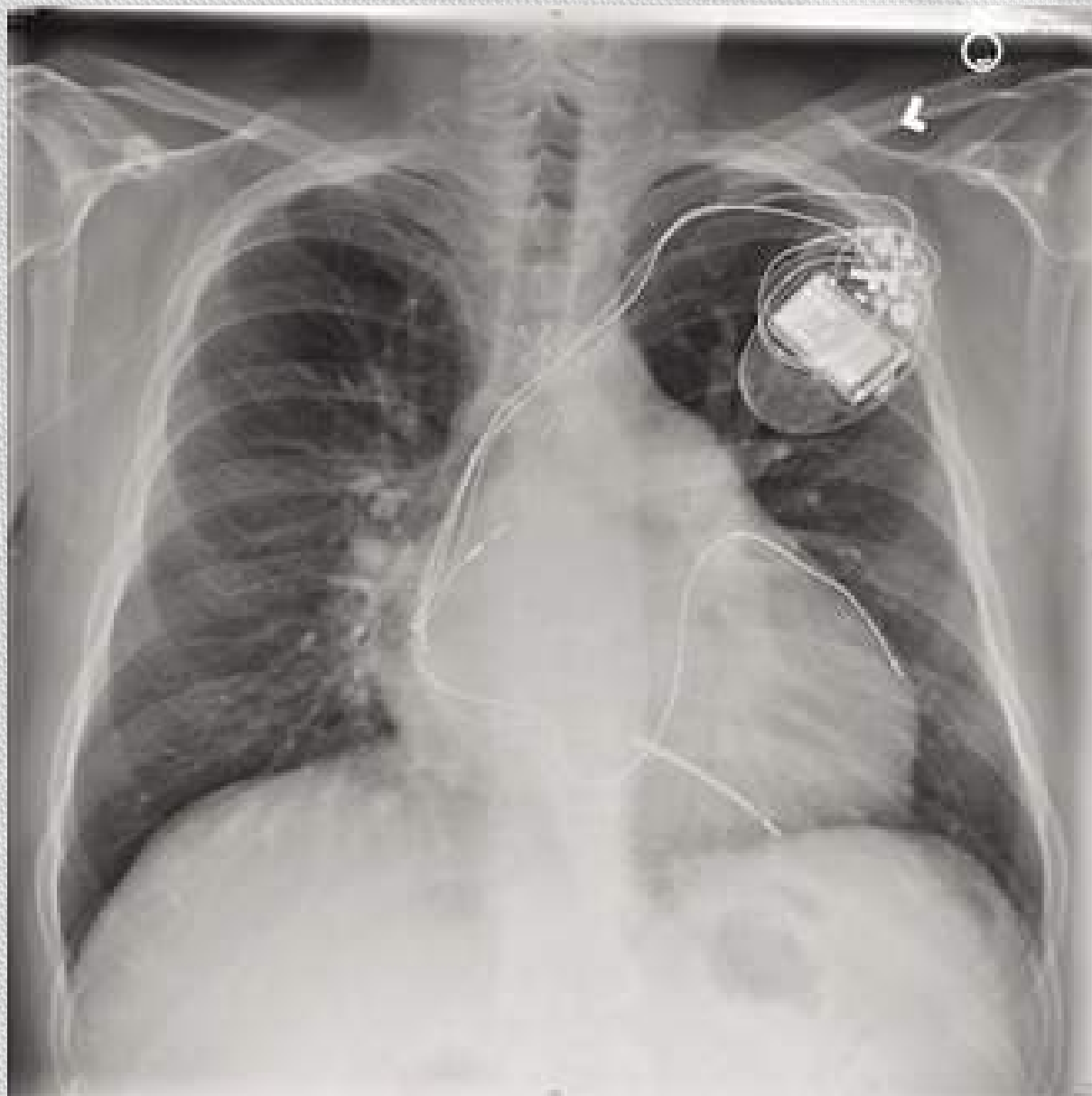
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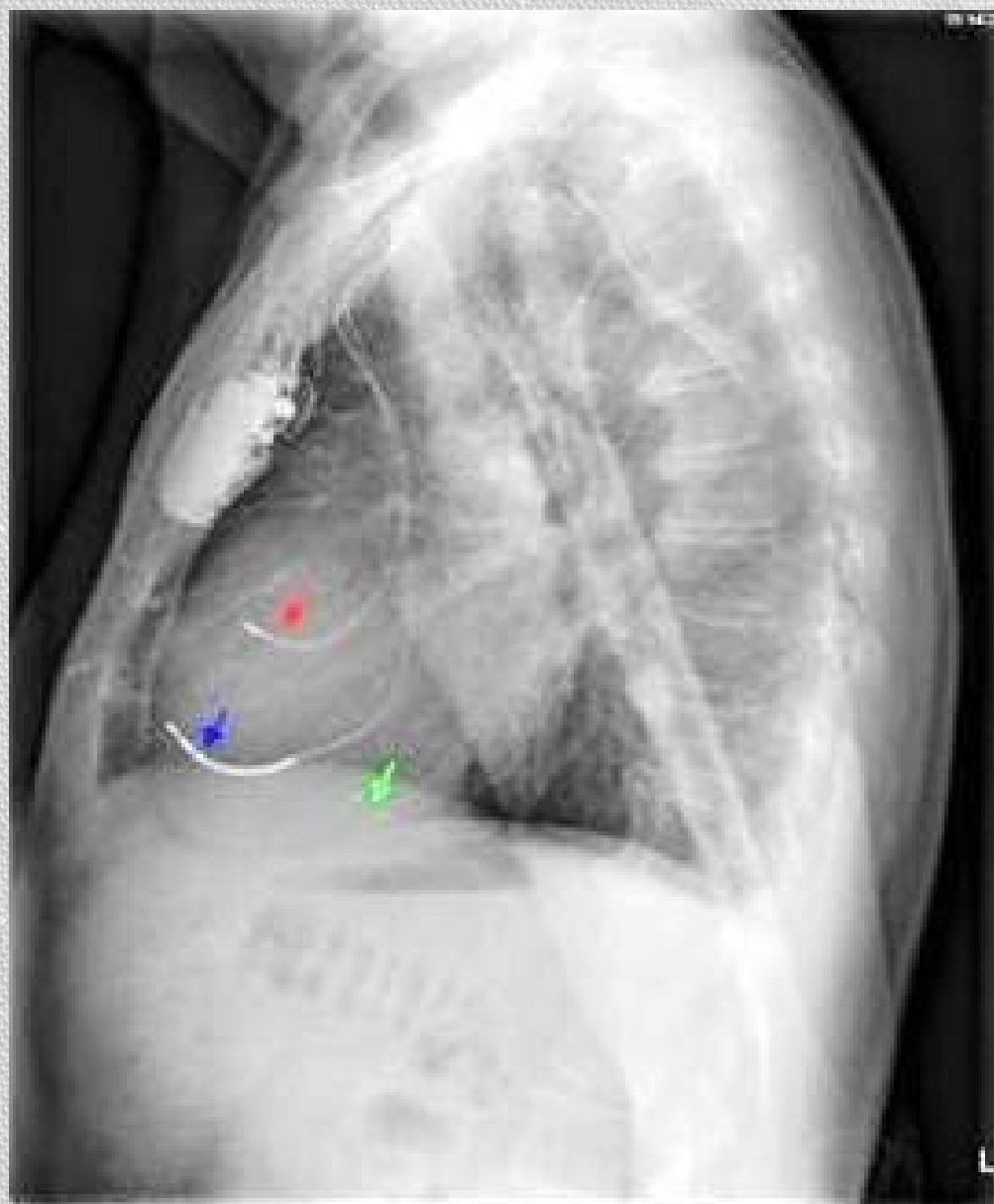


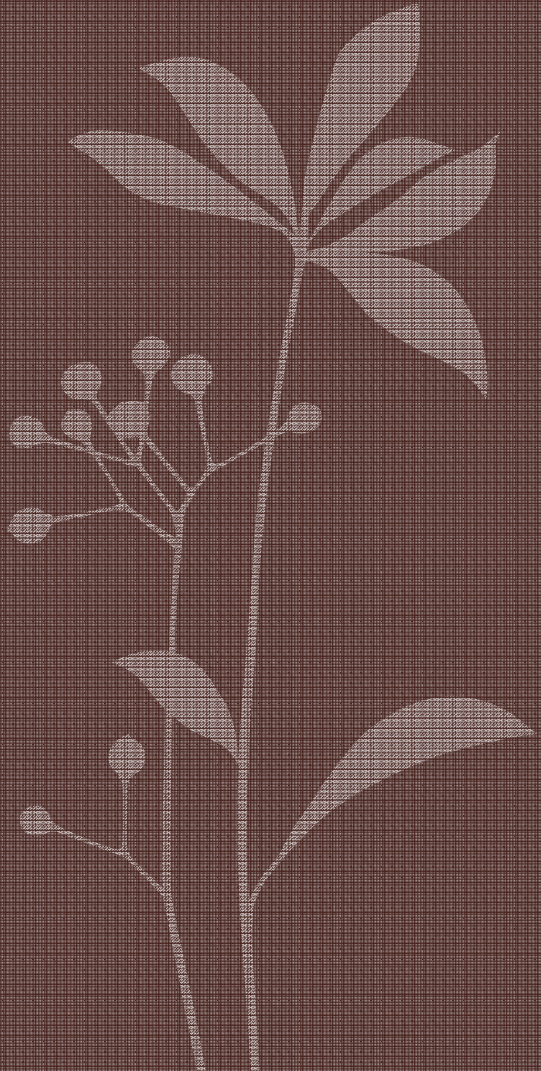
HOW ABOUT THE CXR?





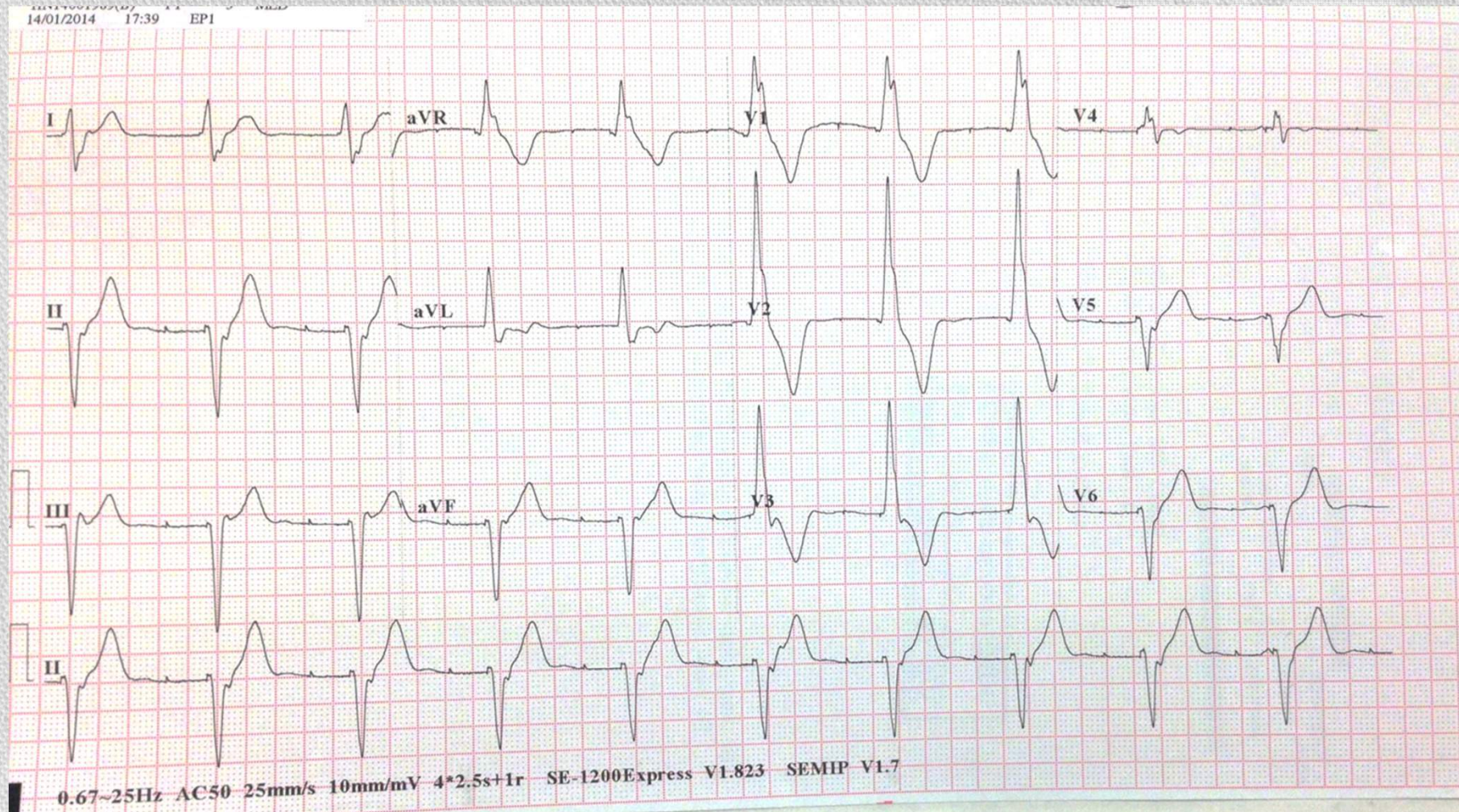






GO BACK TO OUR
PATIENT

ECG on first FU



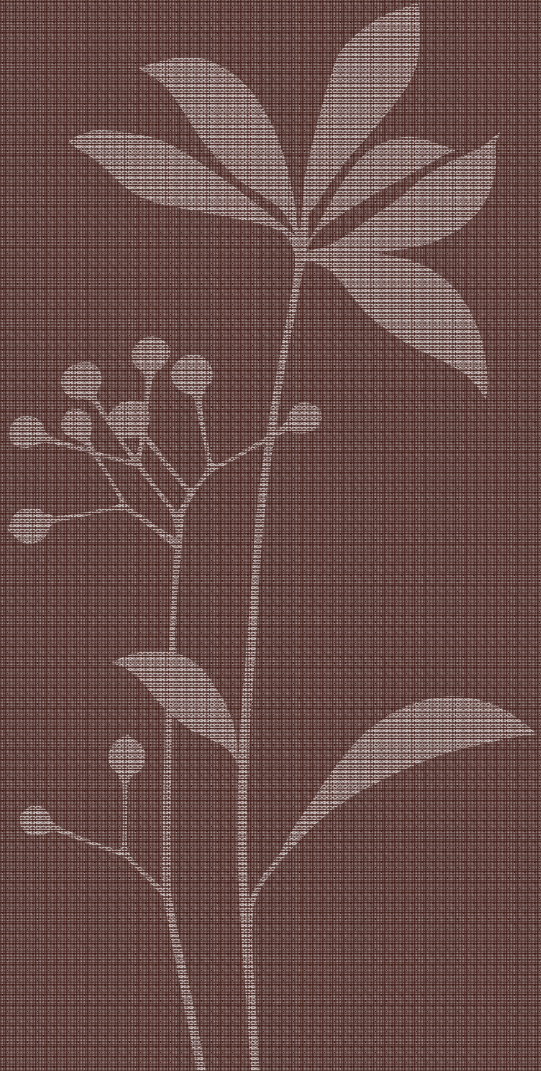
- Normal or abnormal?



Interrogation

Leads Data	Implant 15 Jan 2014	Previous Session	Most Recent
Atrial			
Intrinsic Amplitude	7.0 mV	5.0 mV	1.6 mV
Pace Impedance	400 Ω	385 Ω	514 Ω
Pace Threshold	0.4 V @ 0.5 ms	0.6 V @ 0.5 ms	4.0 V @ 2.0 ms non-Capture
Ventricular			
Intrinsic Amplitude	18.0 mV	19.3 mV	21.8 mV @ 59 min ⁻¹
Pace Impedance	500 Ω	556 Ω	502 Ω
Pace Threshold	0.3 V @ 0.5 ms	0.2 V @ 0.5 ms	Auto 0.8 V @ 0.4 ms

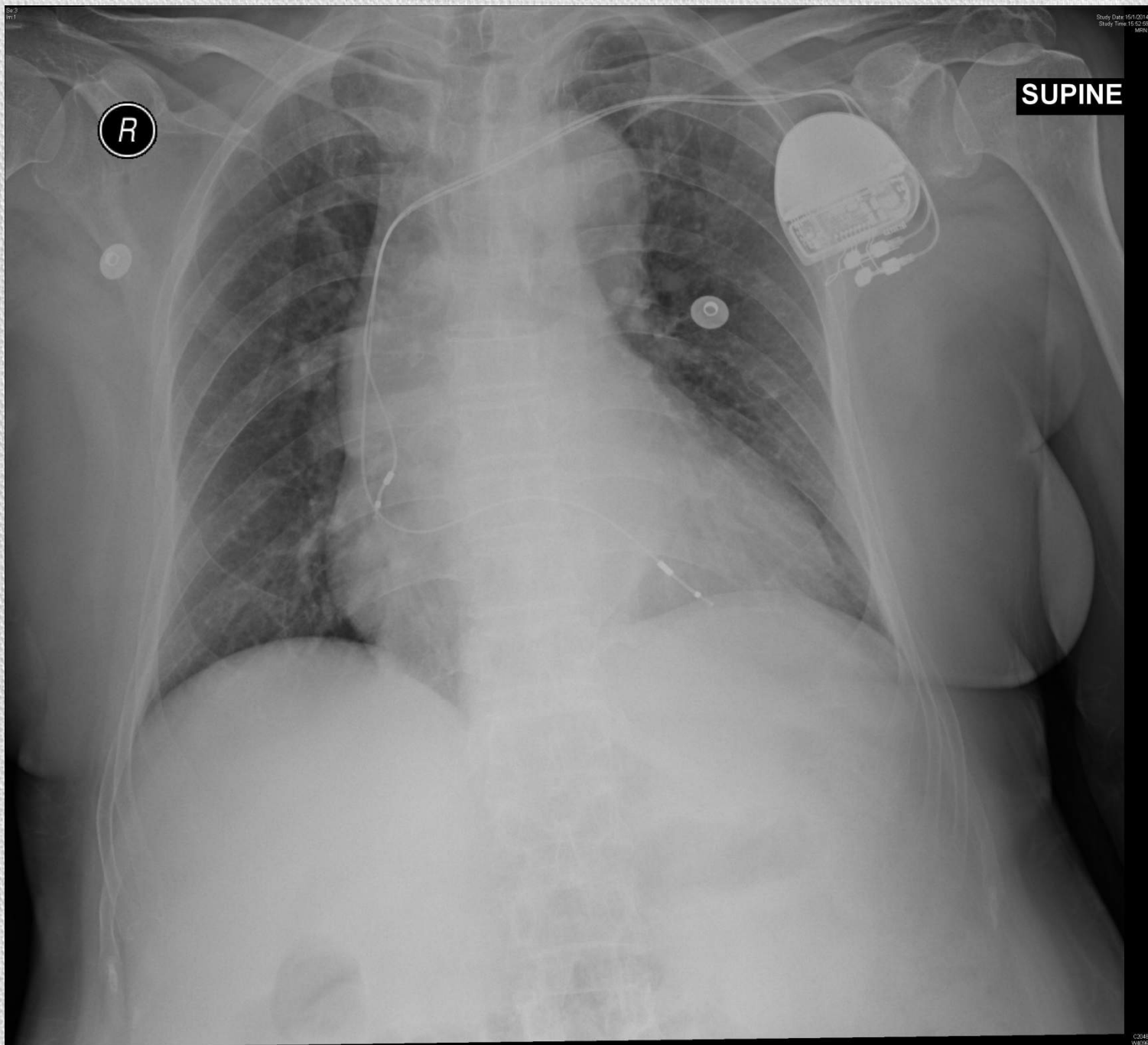
- In summary, A lead was not capturing, V lead sensing a bit high



WHAT WILL YOU DO
NEXT?

- Consult cardiac?
- CXR?
- Echo?
- Holter?
- Treadmill?





Site
Int

Study Date 15/1/2014
Study Time 16:52:59
100%

L



C2048
VNA08

TTE



TEE:

- RA lead seen in RA but dislodged
- RV lead likely passes through PFO to LV
- No obvious thrombus on lead tip

CT thorax:

- Tip of the atrial lead in RA
- RV lead passed via PFO and MV orifice and the tip touching the papillary muscle / inferolateral wall of LV
- No gross filling defect related to the tip of the lead to suggest sizable thrombus



THANK YOU