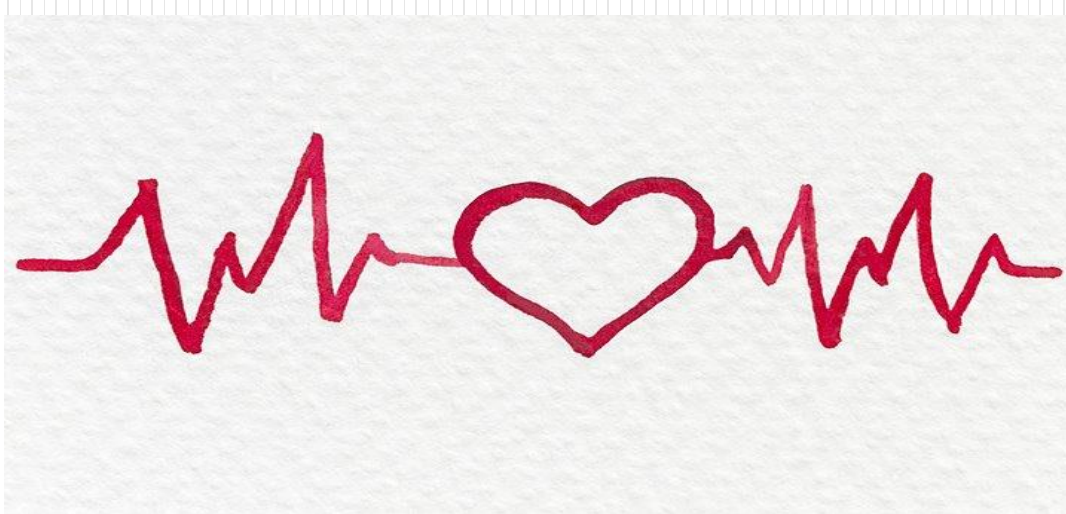


Atrial Fibrillation – What's new, and a case study to finish



Jo Downie
Nurse Practitioner Cardiology

Looking at.....

- Why
- What's actually new?
- Cardioversion and Ablation
- Licence implications
- Case Study

Why new guidelines?

- NHFA and CSANZ undertook a survey with a goal to prioritise clinical conditions that would benefit from locally developed guidelines.
- Atrial Fibrillation (AF) was recognised as burdensome with increasing prevalence in general population (but especially so in the Aboriginal, Torres Strait Island, Maori and Pacific Island population)
- Large numbers of patients not being optimally treated despite clear benefit.
- Variation and uncertainty around medical therapy, increasing availability of AF ablation.
- These are the first Australian guidelines on this topic

So what's actually new?

- Screening
- Novel Risk Factors
- Sexless scoring system
- Medication
- Combining anticoagulation and antiplatelet agents



Screening

- Opportunistic screening for silent AF for people over the age of 65yrs
- Easily done in those with pacemakers and implanted devices
- Implantable loop recorders for patients who have had a embolic stroke of uncertain cause
- Anticoagulation implications

Novel Risk Factors

- Obesity
- Sleep apnoea
- Intercurrent risk factors
- Familial AF and channelopathies



Obesity

- Epicardial fat infiltration of the adjacent atrial myocardium has been indicated in ovine models and may form a unique substrate in chronic obesity.
- Studies of sleep apnoea have highlighted the potentially dynamic nature of this substrate



“My body is apple-shaped and yours is pear-shaped. How can we be unhealthy if we look like a fresh fruit salad?”

PREVEntion and regReSsive Effect of weight-loss and risk factor modification on Atrial Fibrillation: the REVERSE-AF study (2018)

- 355 were included for analysis
- Weight loss was categorized as: Group 1 (<3%), Group 2 (3-9%), and Group 3 ($\geq 10\%$).
- In Group 1, 41% progressed from paroxysmal to persistent and 26% from persistent to paroxysmal or no AF.
- In Group 2, 32% progressed from paroxysmal to persistent and 49% reversed from persistent to paroxysmal or no AF.
- In Group 3, 3% progressed to persistent and 88% reversed from persistent to paroxysmal or no AF ($P < 0.001$).

Conclusion:

- Obesity is associated with progression of the AF disease. This study demonstrates the dynamic relationship between weight/risk factors and AF. Weight-loss management and RFM reverses the type and natural progression of AF.

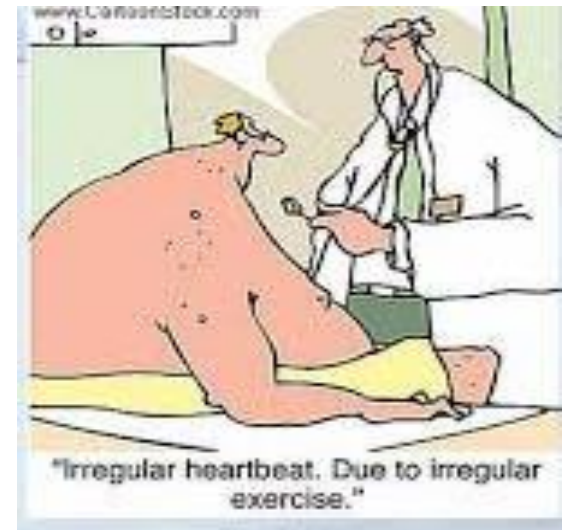
OSA

- Has been consistently shown to be an independent predictor for both the development of atrial fibrillation, and its reoccurrence after cardioversion due to multiple mechanisms which provoke shortening of atrial action potential and induce AF.
- Screening and management of OSA recommended as part of lifestyle modification as continuous positive airway pressure ventilation(CPAP) can reduce AF recurrence.



Intercurrent risk factors

- Hypertension ($\geq 130/80$), diabetes ($\text{HbA1c} \geq 6.5\%$) heart failure, valvular heart disease and alcohol excess (> 3 standard drinks/week), and poor exercise should be identified and managed.
- Management of these is an important part of treatment in AF patients.



Familial AF and channelopathies

- The Framingham study showed a 26.8% incidence of familial AF, of those premature AF in 7.9% young participants (<40yrs). Even after adjusting for modifiable risk factors.
- Studies have implicated mutations of potassium (KCNQ) and sodium (SCN5A) channel genes which results in ventricular arrhythmias are associated with an increased risk of AF.
- Mitral stenosis, congenital heart disease (ASD) and sinus node disease contribute to AF through complex mechanisms identified in clinical studies.

Sexless scoring system

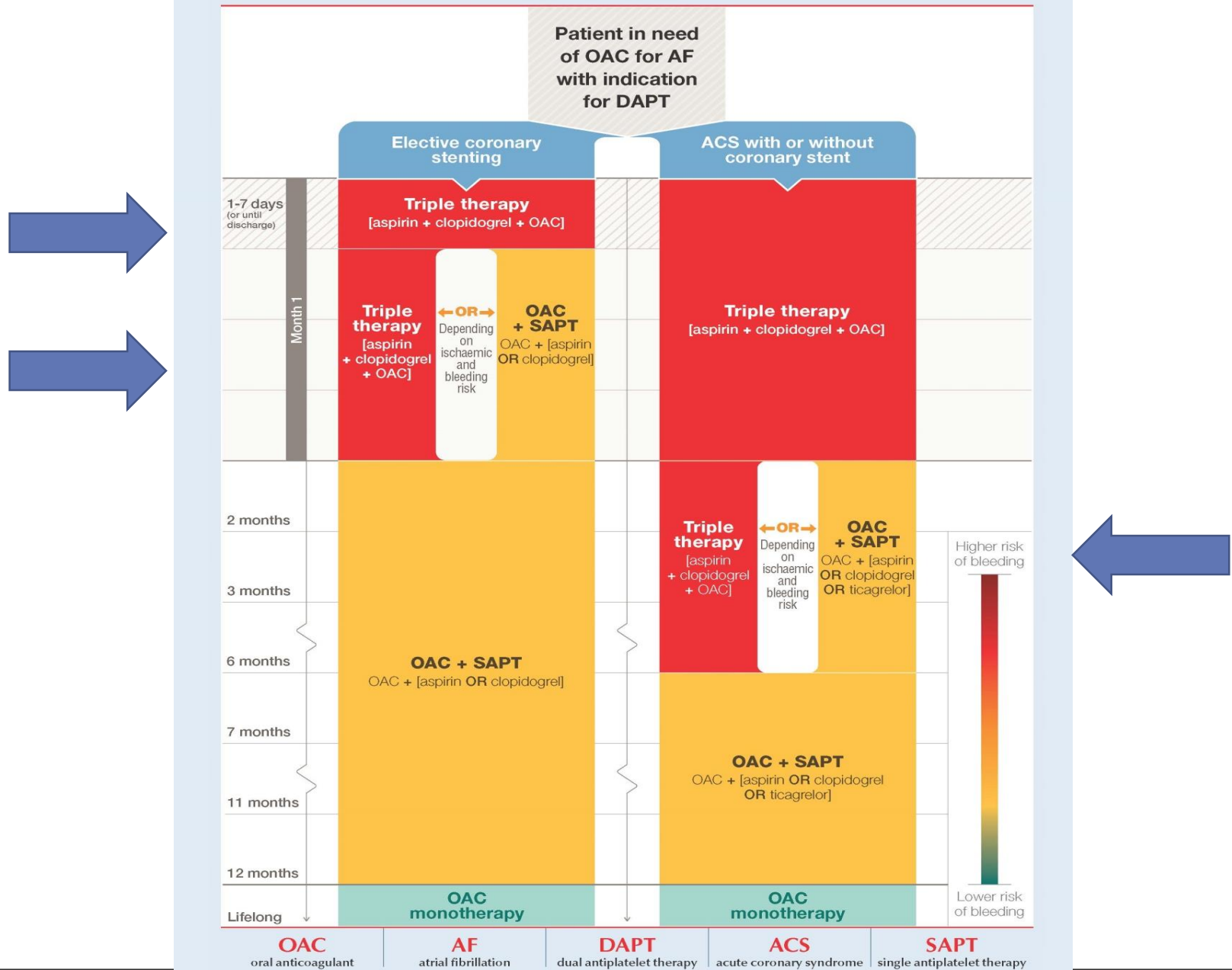
- CHA₂DS₂-VA score
- Due to female sex alone or in the presence of one additional risk factor does not confer sufficient of consistent increased risk.
- Having two thresholds for anticoagulation recommendation is cumbersome, this provides one consistent recommendation for both sexes.
- Annual evaluation of non anticoagulated low risk patients recommended

Medication

- Rivaroxaban 20mg OD – funded since August 2018
- Dabigatran available since 2011, reversal agent available in hospitals (since 2017)
- Older (>75yrs) population benefit from anticoagulation as risk of stroke increases more than risk of bleeding as people age.
- Risk of falls not a reason to withhold anticoagulation in older or frail patients.
- Warfarin recommended for moderate –severe mitral stenosis or mechanical heart valves. NOACs not studied in this population.

DAPT and OAC in AF

Figure 8: Combining anticoagulants and antiplatelet agents



Cardioversion

- Performed urgently in unstable patients
- Rate vs rhythm control
- DCCV either first line approach or if pharmacological rhythm control fails
- 3 weeks anticoagulation pre, and 4 weeks after ($\text{CHA}_2\text{DS}_2\text{-VA} \leq 1$) for elective DCCV
- Flecainide and Amiodarone recommended drugs for pharmacologic cardioversion.
- Pre-treatment with amiodarone (requiring a few weeks of therapy), or sotalol, can improve the efficacy of electrical cardioversion, and likely effects from flecainide and propafenone



Ablation for AF

- Benefit seen for symptomatic paroxysmal or persistent AF intolerant to Anti-Arrhythmic Drugs (AAD)
- Can be considered before initiation of AAD, especially in athletes as AAD therapy not well tolerated due to low HRs
- Considered for symptomatic paroxysmal or persistent AF in selected patients with reduced EF
- Will ablate LA sizes up to 5cm, and even up to 5.5cm in select patients (Waikato)
- Long term success needs to be factored in
- Indefinite anticoagulation in patients at increased risk of stroke, even after successful procedure

LTSA (2014) rules for AF

- Uncomplicated AF doesn't normally need driving restriction unless complicated by episodes of syncope or dizziness.
- If syncope or dizziness then a period of 6 months free of symptoms required before driving again, and may be subject to annual assessment.



Case Study

- Mr M - 45yr old male
- Numerous admissions to ED dating back to 2013 with symptomatic paroxysmal atrial fibrillation
- Thyroid function tests on 01/12/16 normal
- Past history of dyslipidaemia on Simvastatin
- Gout
- Family history of hypertension and atrial fibrillation and his father has Type 2 Diabetes Mellitus.

Echo 2013

- Sinus rhythm. Normal LV size. Moderate asymmetrical LVH. Well maintained LV systolic function.
- EF of 56% by modified Simpsons biplane method. Normal diastolic function. Mildly enlarged LA (23cmsq).
- MV is normal. No MR. No visible SAM. AV is thin and mobile. No AS. There is a mild LVOT gradient of 20mmhg. No increase with Valsalva. No AR.
- Normal RV size. Mild TR. Normal PV. No PR. Interatrial septum appears intact.

Holter Monitor 2017

INTERPRETATION

Indications:

Admitted with atrial fibrillation and history of fast heart rate

Findings:

Vaughan maintained a brief diary of the days activities and reported an episode of feeling hot and flushed. Another of fluttering in the chest and a 3rd of reflux-like symptoms

Monitoring revealed a persisting atrial fibrillation with a min rate 51bpm, ave 90bpm and max 146bpm which was at 7.17am and with no corresponding entry in his diary.

There were 105 ventricular ectopics through this period of monitoring which were all isolated events. The longest RR interval was 2.1secs. The episode of 'hot flush' revealed a ventricular rate of 101bpm and the episode of 'fluttering' revealed ventricular rate between 80-90bpm.

Dr R Kumar, Physician 12/03/2017 (774530)

Signed :

Date :

Registrar clinical review 22 March 2017

- A few episodes of palpitations which last less than a minute, not always exertional, some of them come down at rest. However he generally feels quite flat.
- He is unable to do normal stuff which he was able to do previously. He finds it hard climbing stairs. Previously he used to do exercise in the gym but now he is limited by shortness of breath and general fatigue. Towards the end of the week he is so fatigued that he nearly has to take a rest the whole of the weekend and this has grossly affected his everyday living. He tells me he has stopped coffee almost completely. He doesn't drink alcohol or smoke.
- He works as a Health & Safety inspector which requires a fair amount of walking around.

Medications

- Dabigatran 150mg bd
- Metoprolol CR 95mg bd
- Allopurinol 300mg daily
- Omeprazole 20mg daily
- Zopiclone 3.75mg nocte
- Simvastatin 40mg daily
- Amiodarone 200mg TDS for one week, BD for one week then once daily for two weeks commenced today (attempting to chemically cardiovert him)

Physical exam

- On examination today his weight was 136kg, height 177.5, giving him a BMI of 42. Blood pressure 141/96, pulse 80, oxygen saturations 96. He had no pedal oedema and good colour.
- Cardiovascular examination showed irregular heart rate but rate controlled, no murmurs. Respiratory exam was normal.
- ECG today showed atrial fibrillation at a rate of 93 beats per minute with T-wave inversion in 1, 2 AVL.

Impression:

- Mr M is a 44 year old with atrial fibrillation. I have briefly discussed Mr M with Dr Zhanje regarding option of cardioversion. He recommended initiating Amiodarone loading regime and see him in a month's time to see if he has reverted, if not to consider DC cardioversion.

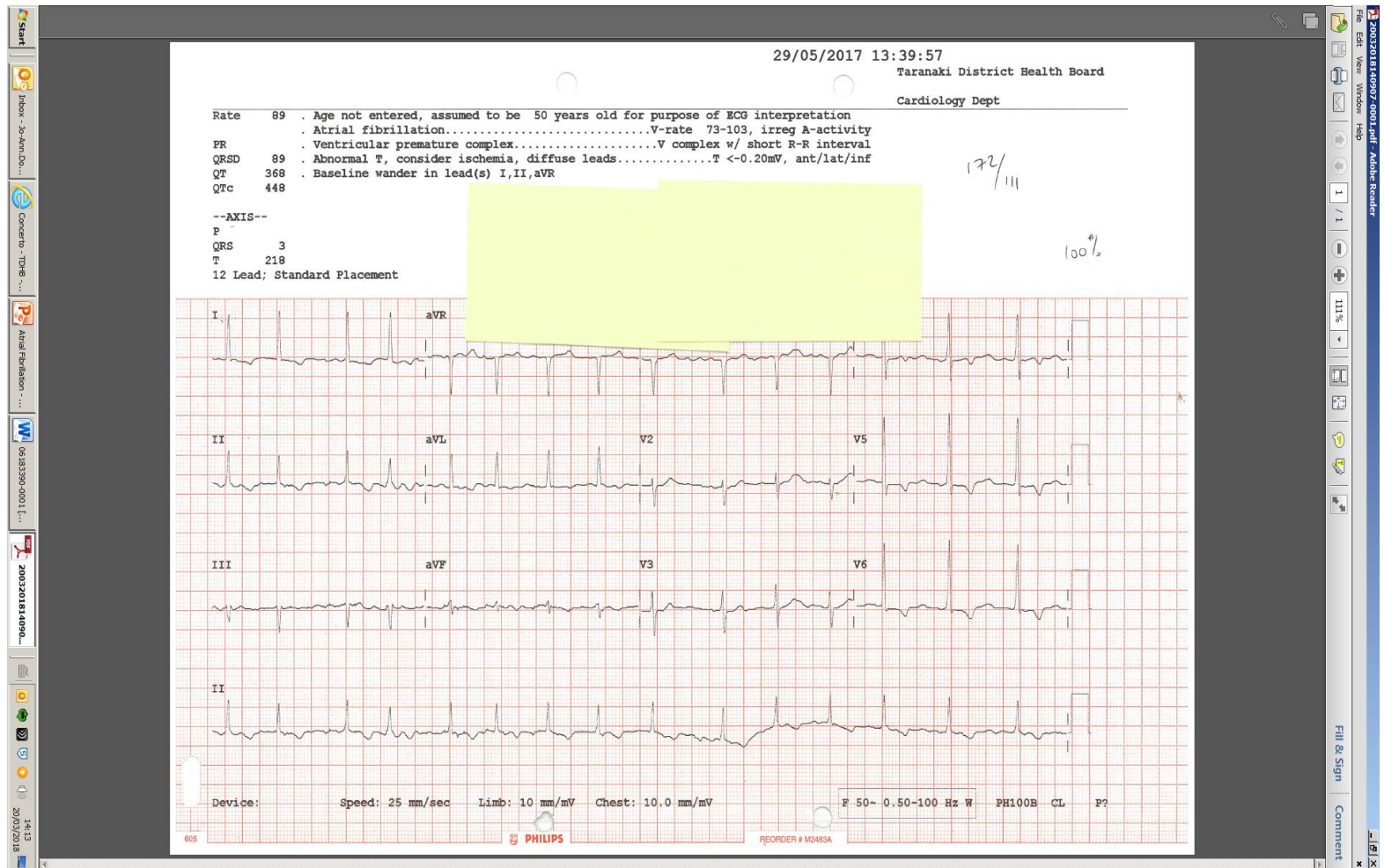
Late April 2017, (followed up in the Reg clinic)

- Still in AF, still symptomatic
- I have cc'd to Jo-Ann Downie who usually organises the cardioversions so she is aware of the thought process in this. Hopefully the cardioversion works and we will be able to take it from there. At this stage I have discharged him from the Registrar Clinic pending cardioversion. Based on the outcome of the cardioversion he may be followed up by Jo.
- Echocardiogram on 16/02/17 showed an ejection fraction of 45%, moderately enlarged LA volume at 42ml/m², no MR, AR or RF.

My first clinic visit with Mr M (Mid May 2017)

- I reviewed Mr M in the Cardiology Clinic today as he has been referred for consideration of cardioversion. I discussed atrial fibrillation and the process of this, also what's involved with cardioversion. He is extremely anxious and he is going to be coming to see you with regards to antianxiety medication prior to his cardioversion.
- Lifestyle modification and weight loss (currently 136kg) discussed as an essential part of management strategy
- On examination his ECG showed atrial fibrillation, blood pressure 166/105, oxygen saturations 99% on room air. There are no clinical symptoms of congestive heart failure.
- At this time he is for discharge until cardioversion. He has all of the information regarding cardioversion and he also has the lab form to be done prior to this.

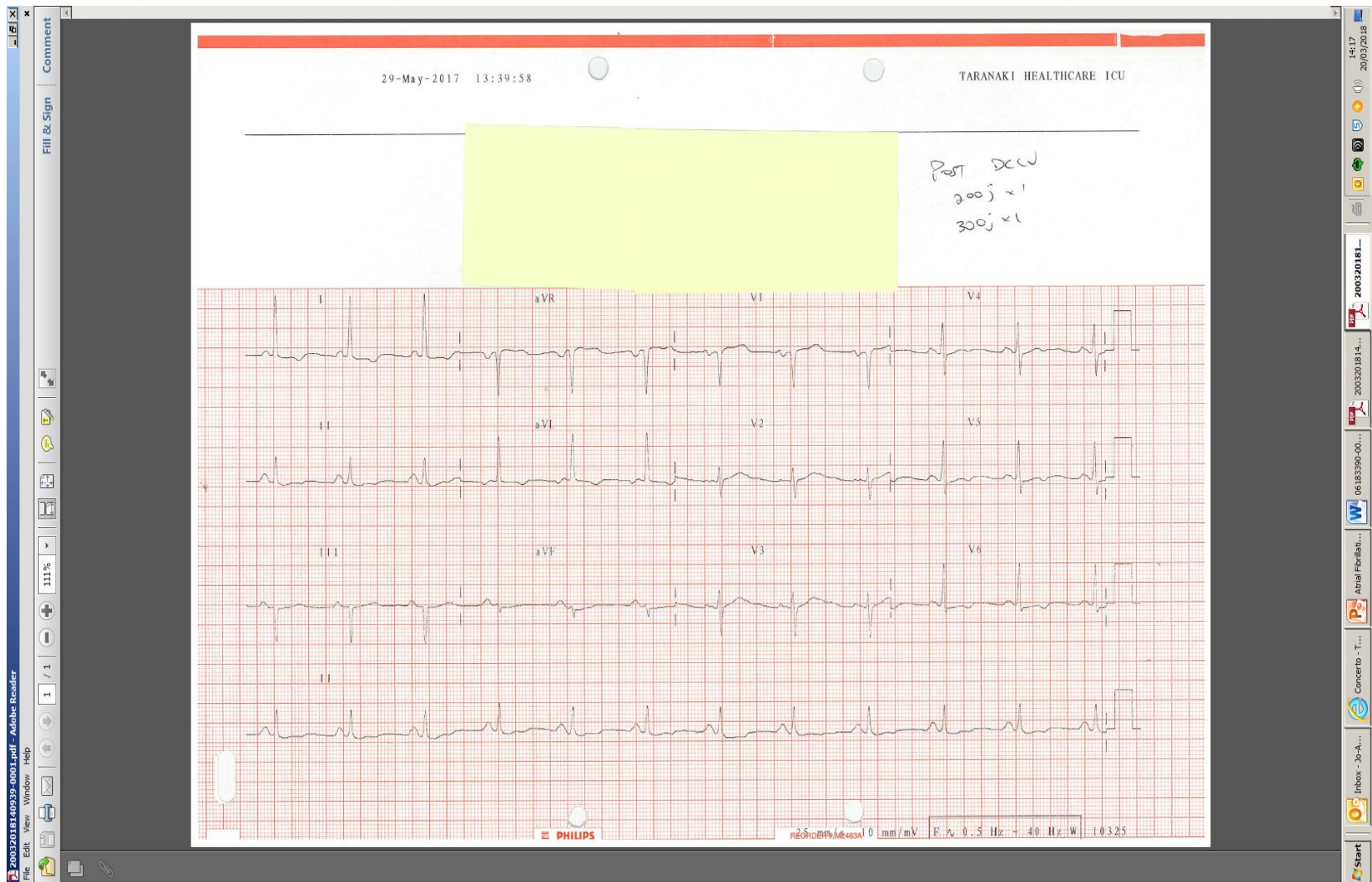
ECG (Pre DCCV) 29 May 2017



DCCV

- This gentleman was successfully cardioverted today. He received 200 + 300 joules of direct current and was cardioverted from atrial fibrillation to sinus rhythm. Heart rate about 100 beats/min in atrial fibrillation, in sinus rhythm, heart rate 70 beats/min. He has remained normotensive in the post procedure period and there have been no complications. He has had something to eat and drink and his wife was in attendance. He is for discharge.
- I will follow him up in one month's time. Mr M is aware to continue with all his regular medications until that time.

Post DCCV



Clinic review October 2017

- Mr M back in atrial fibrillation, he is still very active, he felt very well walking into the clinic today. Unfortunately I had to tell him he had reverted back to atrial fibrillation which he was disappointed about. I discussed his case with a cardiologist, he is to continue with all of the same medications and ongoing weight loss (he had lost about 12kg at this time through Jenny Craig). Dr Zhanje feels it is worthwhile trying another cardioversion when he gets closer to 100kg in weight. For f/u in 3 months.
- Enalapril 20mg once daily (commenced today) blood pressure is 182/112 lying and on standing this changes to 186/119

11/10/2017 13:43:25

Taranaki District Health Board

Cardiology Dept

Rate 72 . Atrial fibrillation.....? atrial activity
PR . Borderline T abnormalities, inferior leads.....T flat/neg, II III aVF
QRSD 90 . Borderline ST elevation, anterolateral leads.....ST >0.06mV, I aVL V2-V6
QT 410
QTc 449

--AXIS--

P

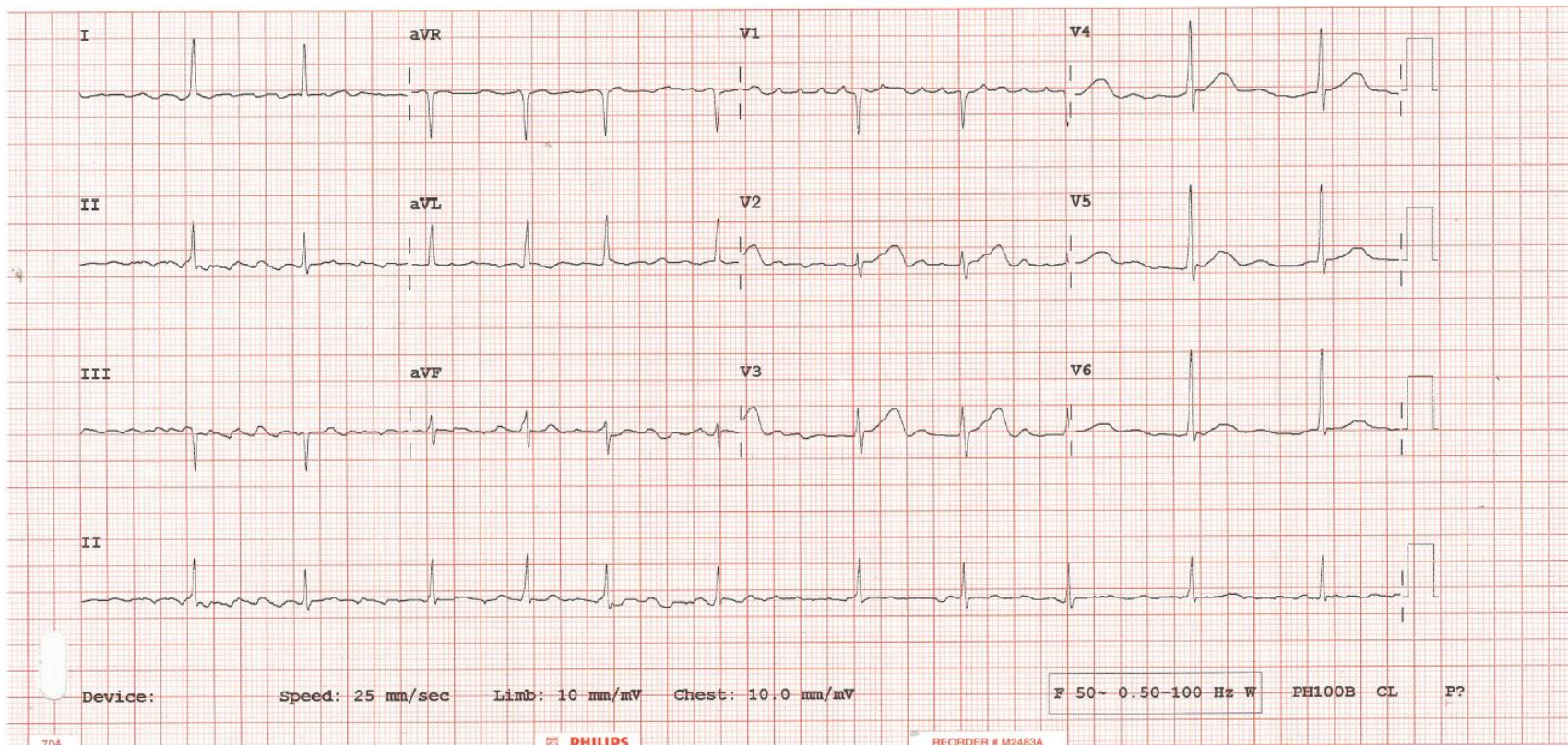
QRS -2

T -73

12 Lead; Standard Placement

- ABNORMAL ECG -

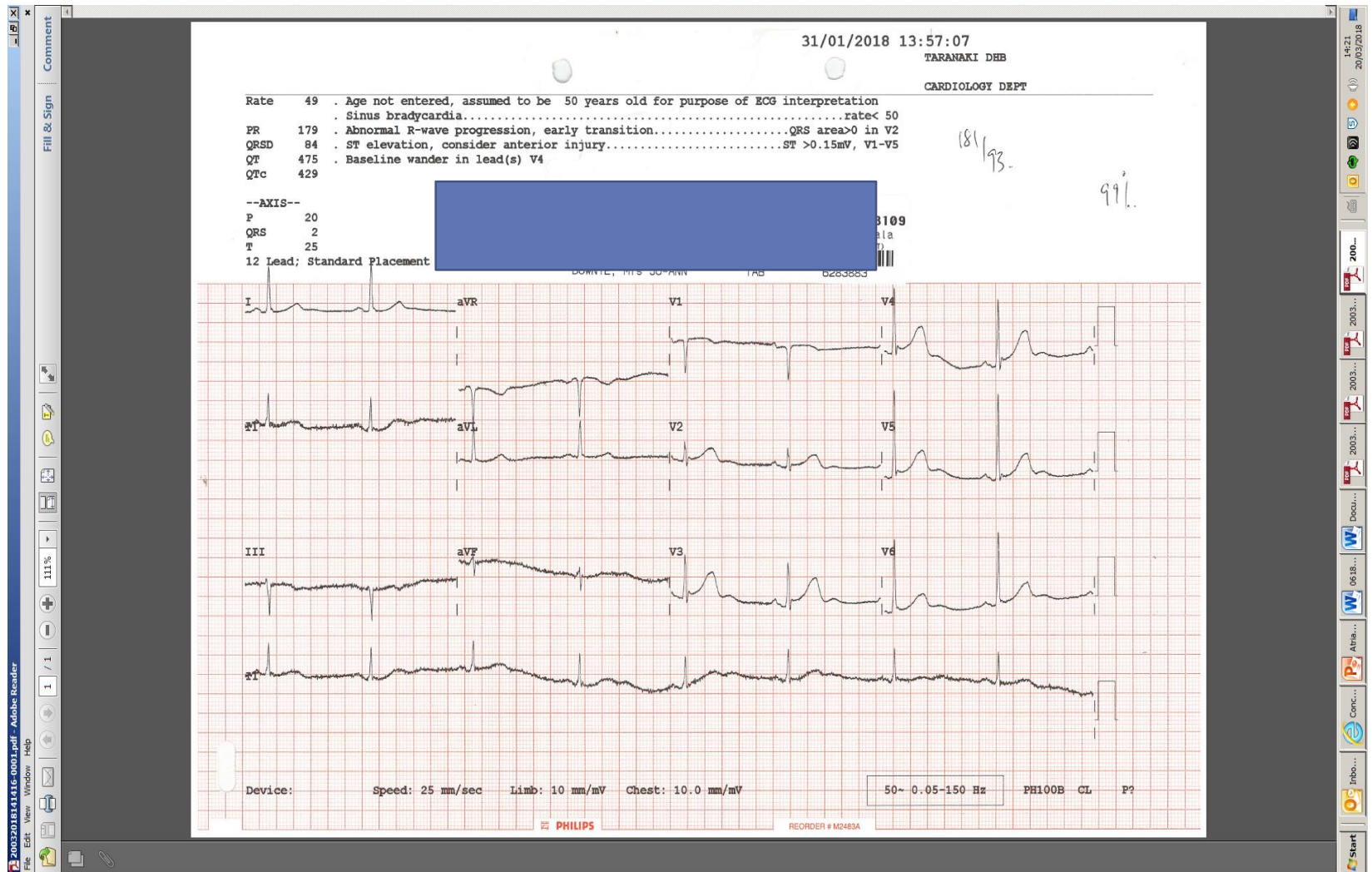
Unconfirmed Diagnosis



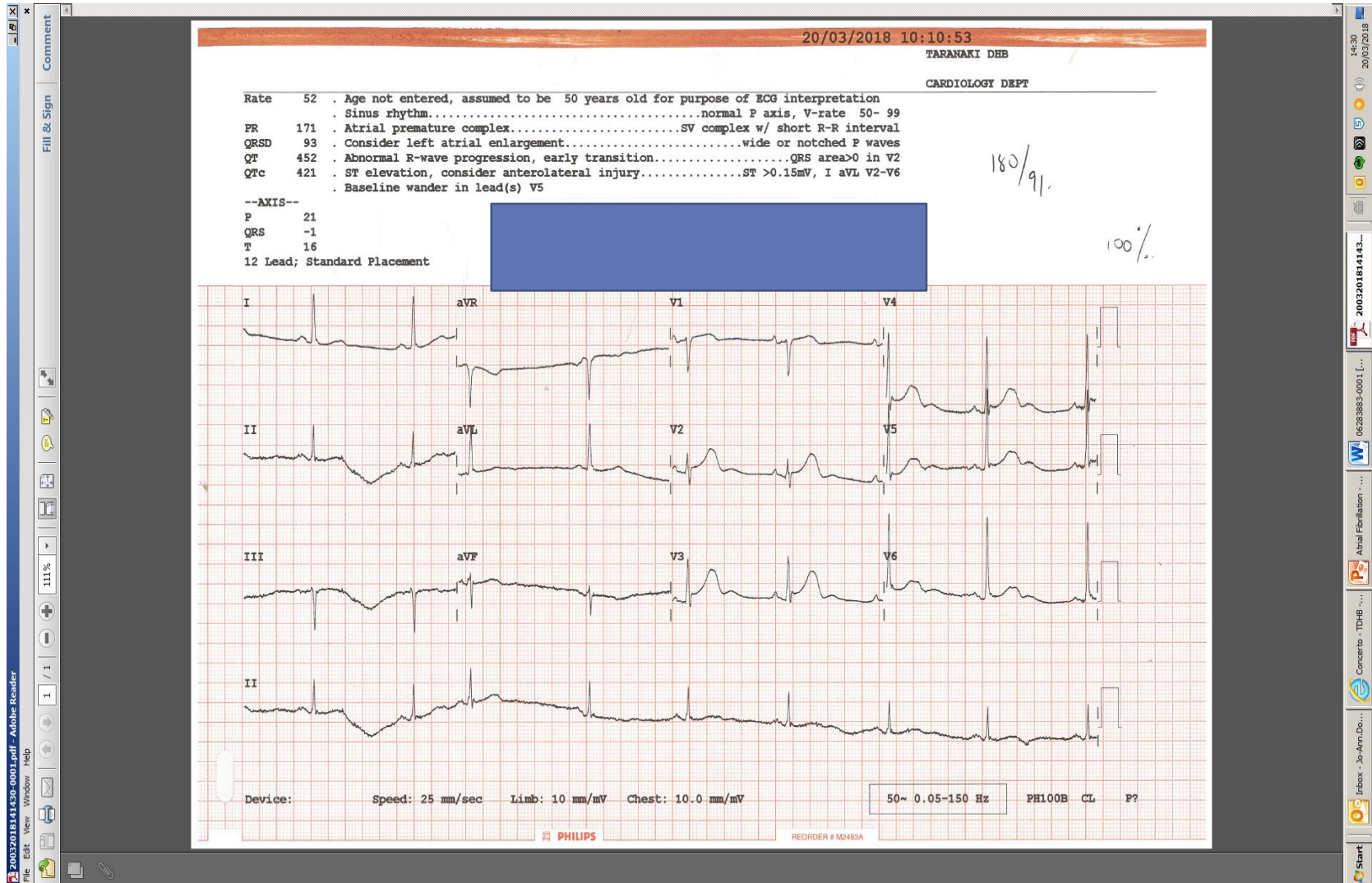
Follow up January 2018

- He said he is feeling much, much better in himself. He has lost about 24kg to date and he is finding that his energy levels have improved markedly. He is attending the gym and doing classes such as spin and other classes. He said that generally his blood pressure is a little bit lower at around 140/90, when you take it today it was up at 158/104 lying and on standing it changed to 159/102, Enalapril increased to 30mg OD.

ECG at that clinic visit ☺



March 2018



Update...

- June 2018 - repeat echo - Patient back in controlled AF. Normal LV size. Mild LVH. Well maintained LV systolic function.
- EF of 57% by simpsons biplane method.
- Moderately enlarged LA volumes(indexed 47ml/m²). revealed AF again
- Seen in clinic 2 weeks after echo and referred to Waikato for consideration AF ablation

Accepted for Ablation

- Oct 2018, attempted AF ablation but heart rotated and unable to get to pulmonary veins after multiple attempts – procedure abandoned.
- Nov 2018 – successful ablation under GA, reviewed in clinic March 2019, remains in SR, weight increased so dietician referral made with patients consent.
- March 2019, remains in SR, has gained 8kg therefore referral to dietician made.



References

- Christopher J. Lettieri. The Relationship Between Obstructive Sleep Apnoea and Atrial Fibrillation: Guidance for Clinicians – Medscape – Dec 19, 2012
- National Heart Foundation of Australia and the Cardiac Society of Australia and New Zealand: Australian Clinical Guidelines for the diagnosis and Management of Atrial Fibrillation 2018
- PREVENTion and regReSSive Effect of weight-loss and risk factor modification on Atrial Fibrillation: the REVERSE-AF study
- 2014 AHA/ACC/HRS Guideline for the Management of Patients With Atrial Fibrillation: Executive Summary
- 2016 ESC Guidelines for the management of atrial fibrillation developed in collaboration with EACTS :The Task Force for the management of atrial fibrillation of the European Society of Cardiology (ESC)