Emergency Department/ AMU RIE

▶ Smartphone Palpitation Service

NHS Lothian

Name _____
CHI _____
DoB _____
Address _____
_____

(or sticker)

Inclusion criteria:	Y	N
1) Presented to ED/AMU with palpitations	☐	☐
2) ECG normal	☐	☐
3) Has compatible apple/android phone, tablet or watch (see p3)	☐	☐
4) Aged 16 years or older	☐	☐
5) Underlying cardiac arrhythmia possible	☐	☐

Exclusion criteria:	Y	N
1) Non-ambulant	☐	☐
2) Patient requires hospital admission	☐	☐
3) Prior diagnostic ECG	☐	☐
4) Multiple frequent episodes. Should represent ED or GP if symptoms	☐	☐
5) Recent MI/severe heart failure/unstable angina	☐	☐
6) Patient unwilling/unable to use AliveCor Heart Monitor & ECG App	☐	☐
7) Cardiac pacemaker/ other implanted electronic device	☐	☐
8) Likely non-cardiac cause for palpitations (e.g. anxiety, sepsis)	☐	☐
9) Associated chest pain or syncope	☐	☐

Procedure to arrange Ambulatory care clinic appointment: **√ as complete**

1. Check phone/tablet/watch compatability (see p3 for compatible devices) ☐
2. Book patient into Ambulatory care clinic. ☐
   - **a.** Take copy of typed TRAK notes and this page to ED/AMU reception desk
   - **b.** arrange time and date for appointment **ON A MONDAY TO FRIDAY ONLY**
3. Ask patient to bring their smartphone/ tablet/ watch to Ambulatory appointment ☐
4. Ask patient to download the Kardia app prior to coming to clinic but not to set up the app (this will be done in clinic) ☐
5. Ask patient to bring their app store password to Ambulatory appointment ☐
6. Print out Page 2 and give patient advice leaflet to patient ☐
7. Ensure Thyroid/FBC, U&Es and Mg taken in ED/AMU ☐

NHS LOTHIAN

NEW ROYAL INFIRMARY OF EDINBURGH

Ambulatory care patient information for patients with palpitations

You are being investigated for the cause of your illness. We are specifically looking for the cause of your palpitations.

The medical team looking after you have decided that you are well enough to go home while we wait for your diagnostic test to be arranged.

You will return to the Ambulatory Care on __ __ / __ __ / __ __ __ __ at __ __ : __ __ hours

When you return to the Ambulatory Care clinic you will be assessed by the team there.

If it is thought that you might be suitable for the Smartphone Palpitation Service, unless you have a compatible watch, you may be given an AliveCor/Kardia Heart Monitor that can be linked to an ECG App.

If you are able to, we would suggest that you should **download the Kardia app** onto your phone or tablet before coming to clinic.

This is done by:
1) Ensure you know your APP store/Google Play username and password
2) Search the App Store for 'Kardia' and download the App to your phone. It requires iOS 10.0 or later if using an Apple device.
3) **DO NOT open the Kardia App on your smartphone/set up the app or create an account (this will be done in clinic)**

You should not enter any identifiable details into the Kardia app. You will have the device for up to 1 month after which time you will return to the clinic and our medical team will review the ECG tracings that you have recorded along with your symptom diary. If you have not recorded an ECG that diagnoses the cause of your palpitations you may be asked to keep the device for a further period.

You should return to the Emergency Department if you develop a further episode of palpitation that makes you feel unwell or that is associated with chest pain, collapse or blackout.

If you have a further palpitation but do not have associated chest pain, collapse or blackout there is no need to return to the Emergency Department or see your GP before you are seen in the Ambulatory clinic again.

You can telephone for advice if you are unsure:

Emergency Department	0131 242 1300
Acute Medical Unit	0131 242 1424

NHS Lothian

iPhone

iPhone 11 (iOS 13.3)
iPhone 11 Pro (iOS 13.3)
iPhone 11 Pro Max (iOS 13.3)
iPhone XR (iOS 13.3)
iPhone XS (iOS 13.3)
iPhone XS Max (iOS 13.3)
iPhone X (iOS 13.3)
iPhone 8 (iOS 13.3)
iPhone 8 Plus (iOS 13.3)
iPhone 7 (iOS 13.3)
iPhone 7 Plus (iOS 13.3)
iPhone 6s (iOS 13.3)
iPhone 6s Plus (iOS 13.3)
iPhone SE (iOS 13.3)
iPhone 6 (iOS 12.4)
iPhone 6 Plus (iOS 12.4)
iPhone 5s (iOS 12.4)
iPhone 5c (iOS 10.3.3)
iPhone 5 (iOS 10.3.3)
iPod Touch (7th Gen) (iOS 13.3)

iPad

iPad 2019 (7th Gen) (iOS 13.3)
iPad Pro 12" (2nd Gen) (iOS 13.3)
iPad Pro 10.5" (2nd Gen) (iOS 13.3)
iPad Pro 12" (iOS 13.3)
iPad Pro 9" (iOS 13.3)
iPad 9.7" (2017) (iOS 13.3)
iPad Mini 5 (iOS 13.3)
iPad Mini 4 (iOS 13.3)
iPad Mini 3 (iOS 12.4)
iPad Mini 2 (iOS 12.4)
iPad Air (3rd Gen) (iOS 13.3)
iPad Air 2 (iOS 13.3)
iPad Air (1st Gen) (iOS 12.4)

Android

Google Pixel 4 (Android 10.0.0)
Google Pixel 4 XL (Android 10.0.0)
Google Pixel 3a (Android 10.0.0)
Google Pixel 3a XL (Android 10.0.0)
Google Pixel 3 (Android 10.0.0)
Google Pixel 3 XL (Android 10.0.0)
Google Pixel 2 (Android 10.0.0)
Google Pixel 2 XL (Android 10.0.0)
Google Pixel (Android 10.0.0)
Google Pixel XL (Android 10.0.0)
Samsung Galaxy S10 (Android 9.0.0)
Samsung Galaxy S10+ (Android 9.0.0)
Samsung Galaxy S9 (Android 8.0.0)
Samsung Galaxy S9+ (Android 9.0.0)
Samsung Galaxy S8 (Android 7.0.0)
Samsung Galaxy S8+ (Android 8.0.0)
Samsung Galaxy S7 (Android 8.0.0)
Samsung Galaxy S6 (Android 7.0.0)
Samsung Galaxy S5 (Android 6.0.1)
Samsung Note10 (Android 9.0)
Samsung Note10+ (Android 9.0)
Samsung Note9 (Android 8.1.0)
Samsung Note8 (Android 8.0.0)
Samsung Note5 (Android 7.0.0)
Huawei Mate 10 (Android 8.0.0)
LG Nexus 5 (Android 6.0.1)
Motorola Moto G Gen 2 (Android 6.0)

KardiaBand

Requires a paired iPhone and Apple Watch®, each of which must be in the list below:

Watch

Apple Watch Series 5 (watchOS 6.0)
Apple Watch Series 4 (watchOS 6.0)
Apple Watch Series 3 (watchOS 6.0)
Apple Watch Series 2 (watchOS 5.2)
Apple Watch Series 1 (watchOS 5.2)

Host iPhone

iPhone 11 (iOS 13.3)
iPhone 11 Pro (iOS 13.3)
iPhone 11 Pro Max (iOS 13.3)
iPhone XR (iOS 13.3)
iPhone XS (iOS 13.3)
iPhone XS Max (iOS 13.3)
iPhone X (iOS 13.3)
iPhone 8 (iOS 13.3)
iPhone 8 Plus (iOS 13.3)
iPhone 7 (iOS 13.3)
iPhone 7 Plus (iOS 13.3)
iPhone 6s (iOS 13.3)
iPhone 6s Plus (iOS 13.3)
iPhone SE (iOS 13.3)
iPhone 6 (iOS 12.4)
iPhone 6 Plus (iOS 12.4)
iPhone 5s (iOS 12.4)

(Correct as of March 2020)

Ambulatory clinic checklist

Ambulatory clinic checklist	√	Comments/action
Visit 1		
1. Retake history and exam		
2. Repeat 12 lead ECG		
3. Ensure Thyroid/FBC, U&Es and Mg measured in ED		
4. Check phone/tablet/watch compatibility		
5. If patient has Apple watch then ensure patient knows how to record ECG and proceed to step 10		
6. Download AliveCor/Kardia App to patients phone/tablet		
7. Give patient AliveCor/Kardia Heart Monitor		
8. Record number of AliveCor/Kardia Heart Monitor		
9. Give Patient Instruction Manual		
10. Ask patient to state explicitly that this is their phone and they will only use it to record their own palpitations, they will not lend it to anyone else for this purpose		
11. Give Patient a copy of Patient Symptom Diary		
12. Book patient into Ambulatory care clinic in 4 weeks		
Visit 2		
1. Interogate AliveCor/Kardia App on patients phone or interogate Apple watch and Patient Symptom Diary		
If no symptomatic ECGs then: 2. Arrange further appointment in Ambulatory care clinic in another 8 weeks (steps 3-7 not required)		
If symptomatic ECGs (normal or abnormal) then: 3. Email patient's ECG to an NHS Lothian email account and insert into TRAK under patient's EPR (see p14)		
4. Repeat 12 lead ECG		
5. AliveCor Device Returned (note number)		
6. AliveCor Device Cleaned		
7. Patient advised and referred back to GP (Sinus, Sinus tachy, ectopic beats) or to Cardiology (SVT, Atrial Fibrillation, Atrial flutter, Atrial tachycardia)		

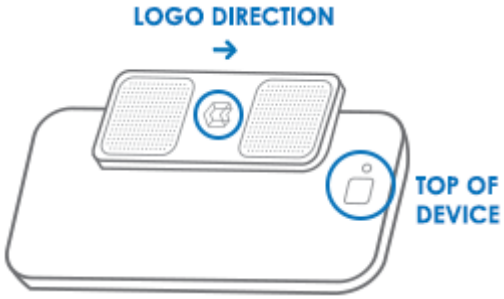
Patient Instruction Manual

The Ambulatory clinic team will have taken you through how to set up and record a heart tracing. These instructions are designed to provide a back up should you have any queries. You will also be able to contact the Ambulatory clinic team Monday to Friday between 9am and 4.30pm on 07885807748.

The Kardia Mobile ECG (heart tracing) and Client Safety

- The Mobile ECG is a very safe test. There are no issues with using it during pregnancy.
- You will be asked to record any episodes of palpitations or near blackout during the next 4 weeks and also record them in a log.

Attach the Kardia Mobile ECG



Direction and orientation matters!

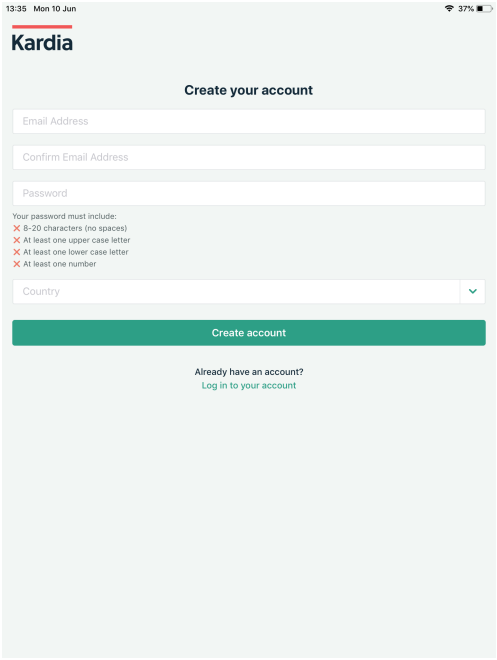
- The mobile ECG is placed on the back of the smart phone or tablet
- Rotate your phone and the Mobile ECG to landscape (longer sides at top and bottom as picture above) and make sure that the word "Kardia" in the centre of the Mobile ECG monitor is upright.
- The electrode (silver plate) above the word "Kardia" will be placed near the top of your device and the electrode below the word "Kardia" will be placed near the bottom of your device.

Download the AliveECG App onto your smartphone

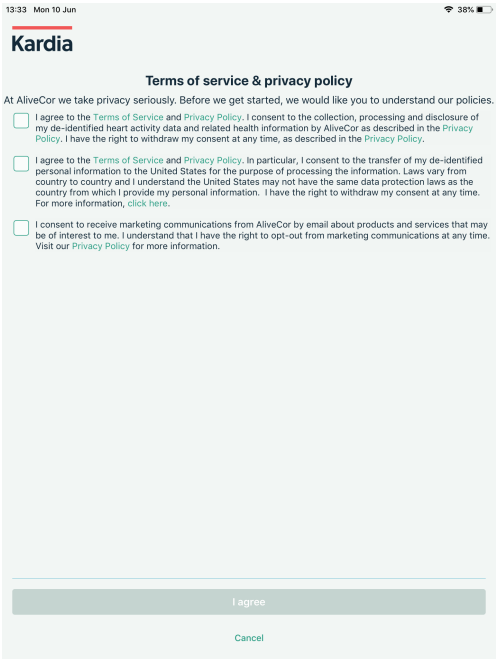
- Ensure you have network access?
- Ensure you know your APP store/Google Play username and password
- Search the App Store for ‘Kardia’ and download the App to your phone. It requires iOS 10.0 or later if using an Apple device.

Open the AliveECG App on your smartphone

- Select ‘Create account’

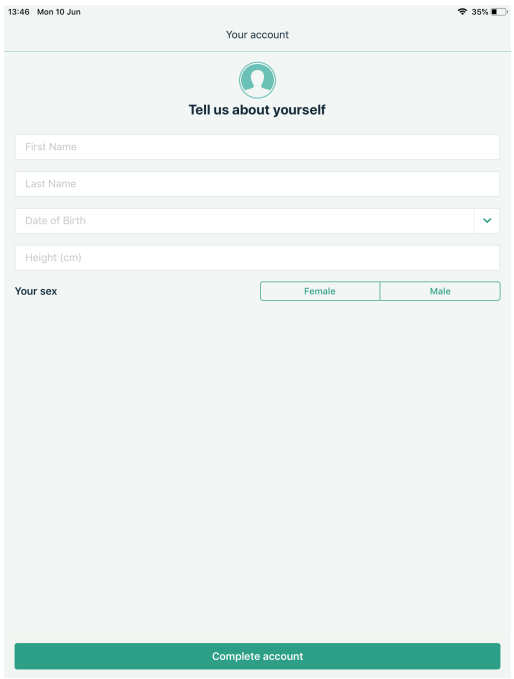


- Terms of Service - **Tick first two boxes**, third box is optional (marketing purpose only). Press 'I agree'. No personal information will be transferred to AliveCor

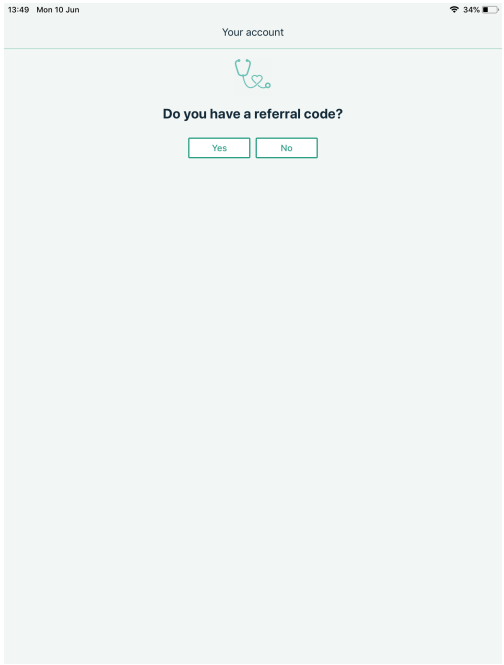


- Create Account – Patient **E-mail required**, enter **new password** (8-20 characters, at least one upper case letter, at least one lower case letter, at least one number). Select 'United Kingdom' as Country. Press 'Create account'

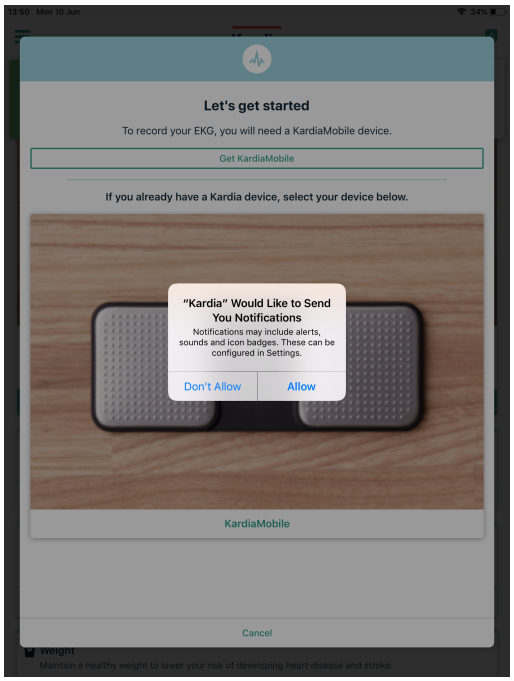
- 'Tell us about yourself' – First name – enter **'ambulatory',** Last name – enter **'care'**, DOB **– enter 01/01/1980 (Standardised for all patients)**, enter actual values for '**Height'** and **'Your sex',** Press 'Complete account'



- Referral Code - choose **NO**

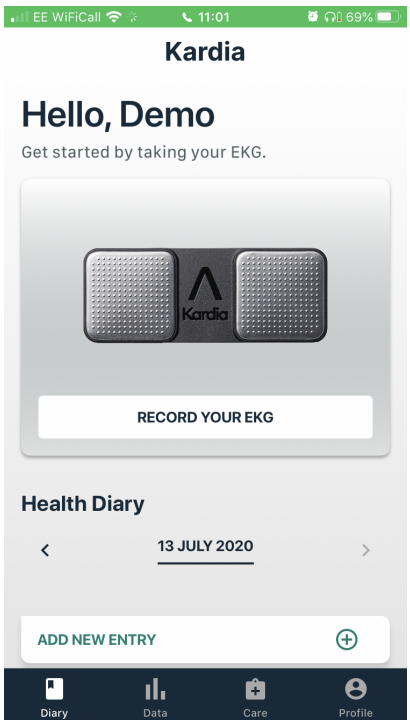


- Select ‘Don’t allow’ when asked if you would like Kardia to send you Notifications



NOTE: No alert image appeared at all when I went through the motions

- Select the Kardia mobile device displayed on the screen

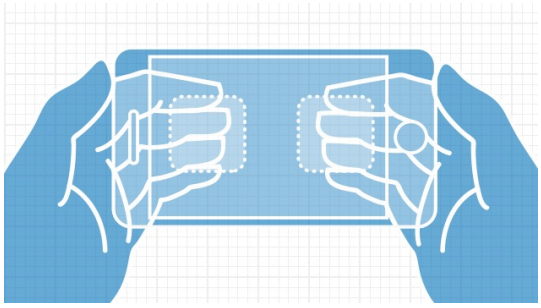


- Select 'allow' when asked if you would like Kardia to Access the Microphone.

- Press on the 3 horizontal lines on the top left of the screen, press 'EKG Settings' and ensure 'EKG reminders' is turned off

Record a Heart Tracing

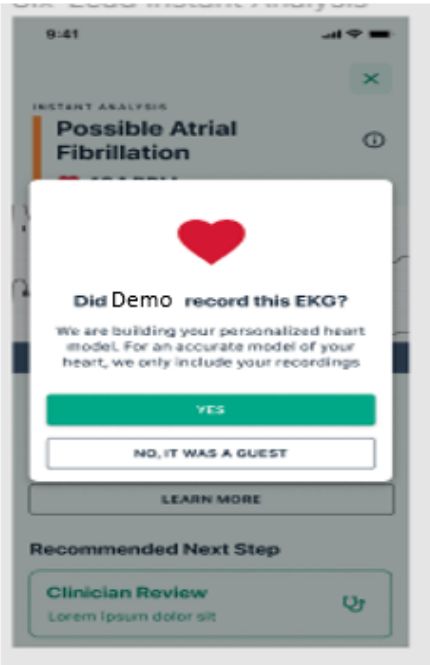
- When you have a palpitation or episode of feeling faint then:
- On the home screen, ‘press ‘Record your EKG’ or ‘Record your first EKG’
- Gently rest the Mobile ECG onto two or more fingers (it doesn't matter which fingers) from each hand and hold still for 30 seconds. The Mobile ECG should not be squeezed
- The left hand should contact the electrode closer to the top of the smartphone, and the right hand should contact the electrode closer to the bottom of the smartphone



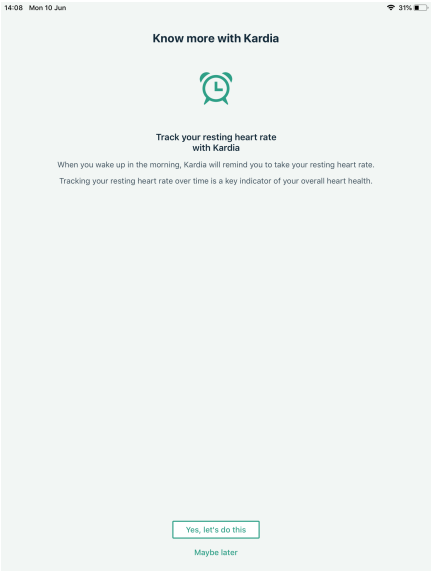
- While recording, try to relax your arms and hands and hold still to reduce muscle noise. It is helpful if you rest your arms and hands on a flat stable surface

Results

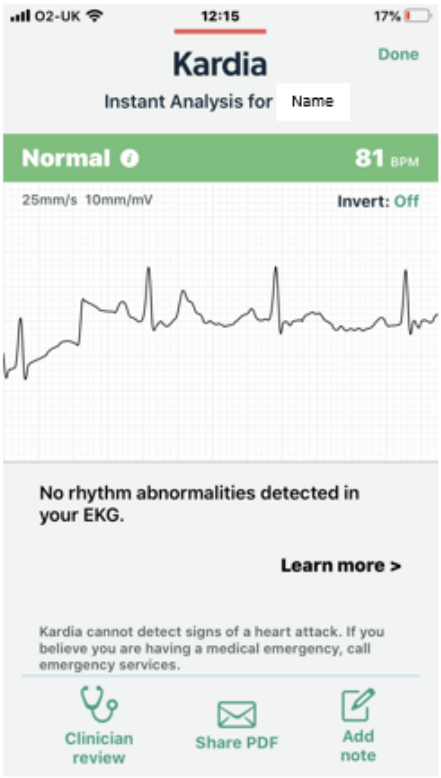
- Once the recording has finished, the App will give you one of several results: Normal, Unclassified, Possible Atrial Fibrillation
- When asked ‘ ‘Did you record this EKG?’ select ‘Yes, it was me’



- Press ‘Done’
- Do not select to track your resting heart rate with Kardia – press ‘Maybe later’



- **Do not select 'Clinician review' from the options after recording an ECG. You should bring your phone back to the Ambulatory Clinic and the medical staff will review all ECGs recorded.**



If you have any questions about the portable heart monitor during the study, or if there is a problem with the device then contact the Ambulatory clinic team Monday to Friday between 9am and 4.30pm on 07885807748.

- Do not select the FREE trial of Premium or enter any other data into the app

More information is available about the Kardia device at https://www.alivecor.com

Appendix: Troubleshooting Guide

Problem	Solution
My Mobile ECG is not working.	If you're taking your first recording, please ensure that your Apple iPhone **"Portrait Orientation Lock" is not on** as you must be able to turn your phone to landscape orientation (bottom of the iPhone in your right hand) in order to take a recording. Ensure that the ***Kardia*** **app has access to the iPhone microphone:** 1. Tap on iPhone "Settings" 2. Tap on "Privacy" 3. Tap on "Microphone" 4. Ensure that "*Kardia*" is turned on (the background of the slider is green) **Change the battery** (we will have put a new battery in for you so the battery is unlikely to have failed) 1. Expose the battery door at the back of the Mobile ECG: a. Remove the case from the smartphone or tablet by pushing the iPhone through the camera cut out, while peeling back the Mobile ECG from this corner. OR b. Remove the Mobile ECG from the attachment plate: 1. AC-001 - AC-007: Place your thumbs on the electrodes and press down firmly. Turn counterclockwise about 45 degrees to "unlock" the Mobile ECG. Once it's "unlocked", the Mobile ECG can then be lifted out of the plate. 2. AC-009: Use your thumbs to slide the Mobile ECG toward the open end of the plate. 3. Remove the battery door: a. AC-001 - AC-007: Use a 1.6mm Phillips screwdriver, press down firmly and turn counterclockwise to remove the screw in the battery door. b. AC-009: Insert a pen, pencil or other similarly shaped object into the cutout next to the battery door to pop the battery door off. 3. Remove the used battery and replace it with a new 3V coin cell battery matched to your model. 4. Orient the battery with the positive terminal up, so that you can see the writing. Remove the protective sticker from the battery, as applicable.
I have a lot of artifact, noise or interference in my recording.	Try the following tips for acquiring the best quality ECG recording: • Clean the electrodes on the Mobile ECG with alcohol-based sanitizer. • If hands are very dry, use a water-based lotion before recording. • When recording from the hands, relax the arms and hands to reduce muscle noise. Rest the forearms and hands on a flat surface and let the Mobile ECG rest on the hands. Do not squeeze the Mobile ECG. • Ensure that your smartphone or tablet is not charging/syncing and you are not using headphones with your smartphone or tablet during the recording. • Make sure that both the smartphone or tablet and the user remain still

	during heart tracing recordings. Movement during recordings will cause noise in the tracing. • Try recording from the chest, right under the pectoral muscle in the mid line.
The heart tracing appear upside down.	In the future, ensure that the left hand contacts the electrode closer to the top of the smartphone or tablet, and the right hand contacts the electrode closer to the bottom of the smartphone or tablet. To invert a recording on your smartphone or tablet, see “Invert the ECG recording” under “Recording Adjustments”.
I forgot my password and I’m unable to reset it.	To reset your password, go to www.alivecor.com and click on "SIGN IN" in the upper right corner and click on the "Forgot your password?" link below the Password field. On the Forgot Password screen, enter your email address and click Submit. Follow the reset instructions in the email. Please note the reset link contained in the email is only active for a short while.
I see large spikes at the start of my recording	Large amounts of noise/artifact can be seen for the first few milliseconds of a recording when the Enhanced Filter is looking for your heartbeat. This is a very rare problem that lasts until your first heartbeat is seen in the app and doesn’t affect the rest of your recording.

Adapted from Chest, Heart and Stroke, Scotland with thanks

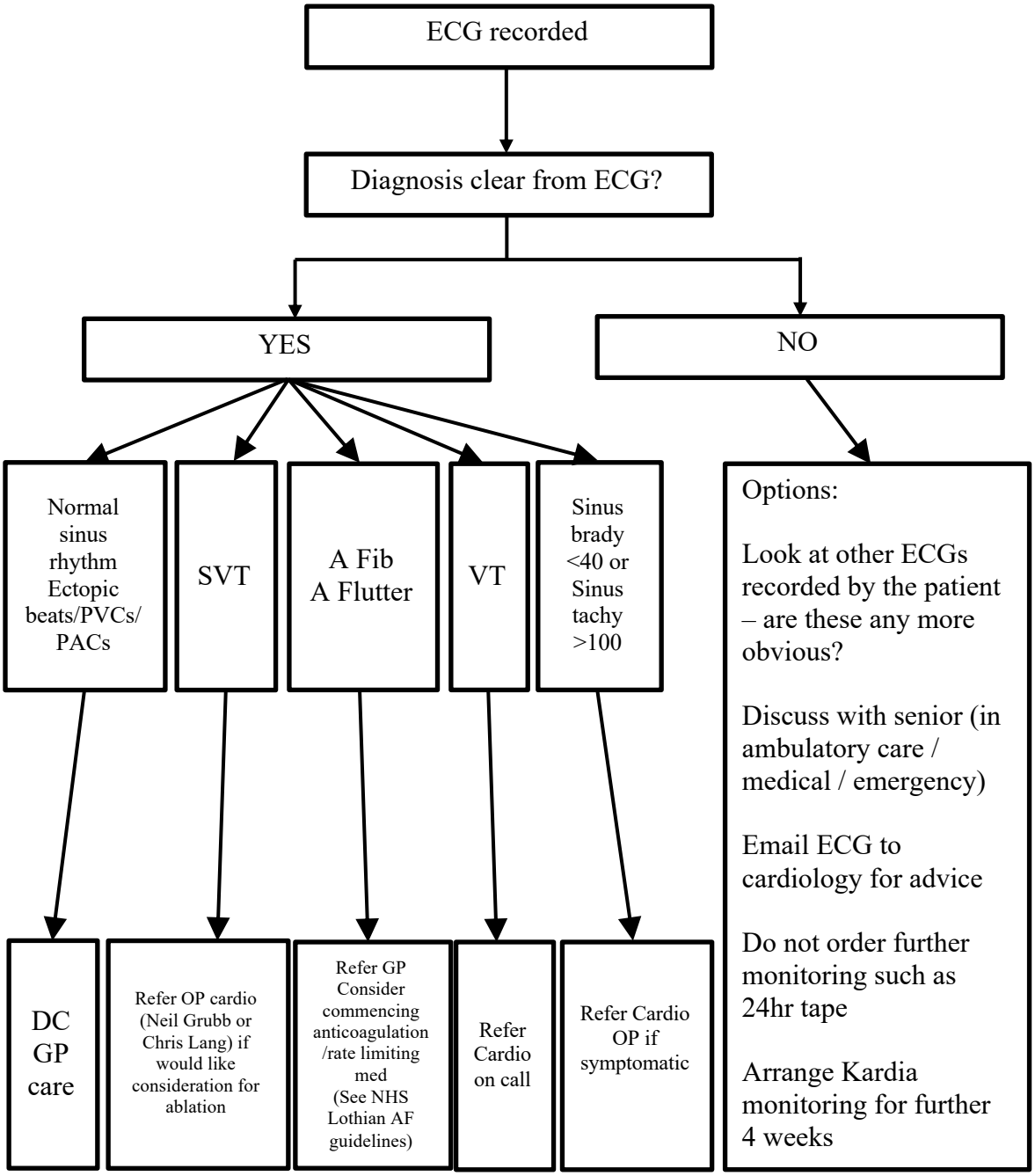
Patient Symptom Diary

Date/Time	**Symptom** 1 = Anxious 2 = Arm or neck pain/tingling 3 = Chest pain or pressure 4 = Dizziness 5 = Fainted 6 = Light headed 7 = Pounding 8 = Fluttering or racing 9 = Short of breath 10 = Skipped /missed beat(s) 11 = Irregular beating	**Duration?** 1 = 1 minute or less 2 = 10 minutes or less 3 = 1 hour or less 4 = More than 1 hour	**Heart tracing recorded?** **YES / NO**

Instructions: How to email patient's ECG to an NHS Lothian email account

- Go into patient's app
- On home screen, Press 'History'
- Select ECG of interest
- Press envelope icon in top right of screen
- Press 'Share pdf'
- Skip password protection
- Email to NHS Lothian email account with details of patient's CHI number or UHPI

Instructions: How to Uploading an ECG to SCI/TRAK

- Patient Enq
- Enter UHPI/CHI
- Highlight Correct Episode
- EPR
- ▼Click Little On left of screen
- Click SCI Doc Upload
- Add date
- Add Doc Specialty
- Add Doc Category
- Add Doc Identifier
- Always Sensitive
- Search – Click your doc from your files
- Upload
- Save

ECG Diagnostic algorithm