

CAA Approved Interpretative Software for ECG Machines

If you have computer diagnostic software installed on your machine, you can pass an ECG as acceptable when supported by:

- Acceptable computer diagnostic statements
- Clinical assessment of the applicant
- Adherence to ECG reporting protocols
- Your own reading of the rhythm strip
- Your comparison of the ECG with previous ECGs, if available.

The computer has a set of reporting algorithms, which when certain conditions are met, lead to certain diagnostic statements being printed on the top of the ECG. The wording of the statements is fixed but several statements may appear together.

Online AMEs must not code an ECG as "Machine Read - Acceptable" if the ECG has any computer statement that is not on the list of acceptable statements.

Clinical assessment of the applicant and adherence to ECG reporting protocols.

There is a little more to this scheme than just relying on the statements below. For some of the acceptable computer statements, whether they appear alone or in an acceptable statement group, you can only accept them if the following conditions are met:

- Marked sinus bradycardia; accept only if rate > 40 bpm
- Minimal or moderate voltage criteria for LVH, may be normal variant; accept only if: physically fit; no hypertension; no murmur
- Rightward axis; accept only if no murmur
- Sinus tachycardia; accept only if rate < 110 bpm

The rhythm strip

The recording of a rhythm strip is optional; however, if you do decide to record a rhythm strip then you must check the rhythm strip carefully.

The reason for this check is that the computer may not report the rhythm strip and so diagnostic statements relate only to the 12-lead recording. Hence, it may be possible that you could have a computer reported normal 12 lead ECG with an abnormality on the attached rhythm strip.

Compare computer statements from previous ECGs

Use your judgment to compare statements from previous recordings.

When you report an ECG in this way the overall responsibility for the accuracy of the report lies with you personally, and so if your ECG reading skills are rusty you should update your skills with a suitable course.

E-Lite

The list of acceptable diagnostic statements is shown below:

- Normal ECG
- Sinus bradycardia (*accept only if rate >40 bpm*)

Marquette 12 SL Software

The list of acceptable diagnostic statements is shown below:

- Marked sinus bradycardia (*accept only if rate > 40 bpm*)
- Marked sinus arrhythmia
- Minimal voltage criteria for LVH, may be normal variant (*accept only if: physically fit, no hypertension, no murmur*)
- Moderate voltage criteria for LVH, may be normal variant (*accept only if: physically fit, no hypertension, no murmur*)
- Normal ECG
- Normal sinus rhythm
- Rightward axis (*accept only if no murmur*)
- Sinus arrhythmia
- Sinus bradycardia
- Sinus tachycardia (*accept only if rate <110 bpm*)

Schiller (SECA, ESAOTE) Software

The list of acceptable diagnostic statements is shown below:

- Sinus bradycardia (*accept only if rate > 40 bpm*)
- Sinus arrhythmia
- Moderate amplitude criteria for left ventricular hypertrophy borderline ECG (as a single statement), (*accept only if physically fit, no hypertension, no murmur*)
- Amplitude criteria for left ventricular hypertrophy possibly abnormal ECG (as a single statement), (*accept only if physically fit, no hypertension, no murmur*)
- Rightward axis (*accept only if no murmur*)
- Otherwise normal ECG
- Normal ECG
- Sinus rhythm
- Sinus tachycardia (*accept only if rate < 110bpm*)

We suggest that "LOW" sensitivity is not selected, see page 51 of your physician's guide.

Cardio View (Biolog) 3000

The list of acceptable diagnostic statements is shown below:

- Normal Sinus Rhythm
- Normal
- Sinus Bradycardia (*accept only if rate > 40 bpm*)
- Sinus Arrhythmia

Hewlett Packard

The list of acceptable diagnostic statements is shown below:

- Normal ECG
- Otherwise normal ECG
- Sinus rhythm
- Sinus arrhythmia
- Sinus bradycardia (*accept only if rate >40 bpm*)
- Sinus tachycardia (*accept only if rate <110 bpm*)
- LVH by voltage (*accept only if: physically fit, no hypertension, no murmur*)
- Right axis deviation (*accept only if no murmur*)

Nihon Kohden

- 1100 Sinus Rhythm
- 1102 Sinus Arrhythmia
- 1108 Marked Sinus Arrhythmia
- 1120 Sinus tachycardia (*accept only if rate < 110 bpm*)
- 1130 Sinus bradycardia (*accept only if rate > 40 bpm*)
- 5211 Minimal Voltage criteria for LVH, may be normal variant (*accept only if: physically fit; no hypertension; no murmur*)
- 5222 Moderate voltage criteria for LVH, may be normal variant (*accept only if: physically fit; no hypertension; no murmur*)
- 7102 Moderate right axis deviation (*accept only if no murmur*)
- 9110 ** normal ECG**

In this scheme an ECG with any number of the above statements can be acceptable, but no matter how many acceptable diagnostic statements the ECG has, if there are any statements that are not on the list above (there is an exception to this - see below), or if you have any other doubts about the ECG, then you should refer that ECG for physician reading.

Hence:

Sinus bradycardia

Moderate voltage criteria for LVH, may be normal variant

...is acceptable.

However,

Sinus bradycardia

Moderate voltage criteria for LVH, may be normal variant

Non-specific T wave abnormality

...is not acceptable.

Now there is an exception to this, the program produces diagnostic statements with various codes and then the last statement that the program produces may be the so called "Overall Judgment" statement, it will begin with the code 91..

The list of acceptable statements above only includes one overall judgment code which is invariably acceptable - 9100 ** Normal ECG**

However, sometimes, but certainly not always, the overall judgment codes 9130 **Borderline ECG** and 9140 **Abnormal rhythm ECG**, can be associated with acceptable diagnostic statements. To get around this problem these (9130 and 9140) overall judgment codes are acceptable only when they appear in the groups below.

Acceptable statement groups:

1100 Sinus Rhythm

5211 Minimal Voltage criteria for LVH may be normal variant

9130 **Borderline ECG**

1100 Sinus Rhythm

5222 Moderate Voltage criteria for LVH may be normal variant

9130 **Borderline ECG**

1120 Sinus tachycardia

9140 **Abnormal rhythm ECG**

1130 Sinus bradycardia

9140 **Abnormal rhythm ECG**

1100 Sinus Rhythm

1108 Marked sinus arrhythmia

9130 **Borderline ECG**

Glasgow Interpretive Algorithm

Software using this algorithm will be permitted but for an initial period the CAA will be auditing ECGs to further refine the list of acceptable statements. Any AME wishing to use a machine where the software uses this algorithm should inform the CAA – by e-mailing medicalweb@caa.co.uk. On receipt of an acknowledgement that the email has been received, they can immediately start using the machine as part of their practice. An aeromedical nurse specialist will contact the AME regarding the submission of ECGs (and MED108 forms) for audit.

Initially, the following statements are acceptable:

- Rightward Axis (accept only if no murmur)
- Consider LVH suggested by voltage criteria only (accept only if: physically fit, no hypertension, no murmur)
- Sinus rhythm
- Sinus tachycardia (accept only if rate <110bpm)
- Sinus bradycardia
- Sinus arrhythmia
- Within normal limits

Any other statement will require that the ECG is over read by a cardiologist. A copy of all ECGs and MED108 forms (where the ECG needed to be over read) should be submitted to the CAA as discussed with the aeromedical nurse specialist. When a sufficient number of ECGs have been received, the audit will be completed and this document updated.