CAA ECG Reporting System

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Development

- Principles of Best Regulation
- Clinical Quality
- Business efficiency in AeMC
  - Code of practice and service standards
  - Previous practice deskills and prevents the aviation medical examiner from developing ECG reading skills.
  - ECGs should be properly reported in conjunction with clinical evaluation of the applicant - The aviation medical examiner has already evaluated the applicant

- Review of AeMC ECGs
  - Literature review
  - Retrospective and prospective studies
- Very high specificity (c99%)
ECG Procedure

- Applicant History / Declaration
- Applicant Examination Findings
- Record ECG
Top tips for recording ECG

- The patient should be warm and comfortable - shivering produces muscle artefact.
- Hyperventilation associated with anxiety can cause T wave abnormalities.
- Ingestion of cold drinks may cool the heart sufficiently to also cause T wave abnormalities.
- Unusual axis – check limb lead switch
- Leads V1 and V2 should be placed in the 4th intercostal spaces, a common error is to take the small space between the clavicle and the first rib as the first intercostal space – it is not, it is the space below this. This error is associated with the remaining chest leads being incorrectly positioned, this generally results in an rsr' pattern with inverted P and T waves
- Reversal of V2 and V3 may give apparent poor R wave progression
ECG Procedure

- Applicant History / Declaration
- Applicant Examination Findings
- Record ECG
- AME review of ECG
  - Technical quality
  - Diagnostic statements
  - Own review
AME review

- Substantial changes to or abnormalities of rate / rhythm
- Substantial axis shift
- PR duration
- QRS duration & morphology
- T waves
ECG Recording/Reporting Overview

- Applicant History / Declaration
- Applicant Examination Findings
- AME review of ECG
  - Technical quality
  - ECG Machine Diagnostic Statement(s)
  - Own review
- Code ECG on AME on Line
- Review / Submit / Retain ECG
‘Approved’ Interpretive Software

- Marquette 12SL
- Schiller/SECA/ESAOTE
- Cardioview (Biolog) 3000
- Nihon Kohden
- Hewlett Packard

****Acceptable statements are machine specific****

**Unacceptable statement(s) with “no change” is not acceptable**
Hewlett Packard

- 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**
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**
Cardio View (Biolog) 3000

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

E-Lite

- Normal ECG
- Sinus bradycardia *(accept only if rate >40 bpm)*
Schiller / SECA / ESAOTE

- **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 < 110 bpm)*
Marquette 12 SL

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

- Sampling
- Checking that system used is acceptable
- Checking of acceptable statements
- Cardiologist over-reading
- Certificatory actions
- Feedback to AME
Key Messages

- Acceptable software
- Clinical history <-> Examination <-> ECG
  - Diagnostic statements and your review
- Admin / recording on AME on Line

**Acceptable statements are machine specific**

**Unacceptable statements with “no change” are not acceptable**