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 <u>not</u> 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**

Nihon Kohden

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 < 110bpm)*

Marquette 12 SL

- 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)*

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 <u>your</u> review
- Admin / recording on AME on Line

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

****Unacceptable statements with “no change” are <u>not</u> acceptable****