All Wales Clinical Biochemistry Audit Group
Standards for Multiple Blood Gas Analysers in the same Trust

INTRODUCTION

Blood gas analysis is generally required urgently and prompt assay is essential as sample quality rapidly deteriorates. There are therefore particular advantages in point of care testing (POCT, formerly termed near patient testing) for this investigation, which was previously only performed in pathology laboratories. This has led to widespread extra-laboratory siting of point of care blood gas analysers in acute hospitals. The Welsh Scientific Advisory Committee (WSAC) first issued guidance on POCT in 1984 (WSAC/D/1/84) and issued revised guidelines in 1995 and 2004.[1] The Royal College of Pathologists (RCPath) issued guidelines for POCT in 2004.[2]

It is important that the practice of blood gas analysis at all sites in the same Trust is undertaken in a harmonised way, to avoid confusion and clinical risk that may occur if practice varies. A recent survey of blood gas analysis in acute Welsh Trusts was presented at an audit meeting in May 2003 and showed variations in practice both within and outside laboratories. The following core standards are recommended in the light of the survey findings and discussion at this meeting.

STANDARDS

(A) All sites (Clinical Laboratories and Extra-Laboratory)

1. Acid Base parameters to be reported:
   - pH and Hydrogen ion concentration, as nmol/L
   - Carbon Dioxide tension (pCO_2), as both kPa and mm Hg
   - Oxygen tension (pO_2), as both kPa and mm Hg
   - Calculated Oxygen (O_2) saturation, as %, but only where co-oximetry is **not** available
   - Base Excess, as mmol/L
   - Bicarbonate concentration (standard and/or actual, but must be specified), as mmol/L

2. Co-oximetry parameters to be reported where co-oximeter in use:
   - Oxygen (O_2) saturation, as %
   - Total Oxygen (O_2) content
   - Carboxyhaemoglobin, as %
   - Methaemoglobin, as %

3. At least 1 level of internal quality control (IQC) to be run daily for each analyser in use.

4. Participation in an accredited external quality assessment scheme (EQAS) for each analyser.

(B) Extra-Laboratory sites - additional standards

1. The laboratory should be involved in any decision to purchase blood gas analysers. It is preferable for similar blood gas analysers to be used at all sites within the same Trust.

2. The laboratory should be involved via a service level agreement in providing technical support.

3. Results should be entered in the patient's notes or transmitted to the patient's electronic record.

4. Results should be recorded in the laboratory information (computer) system.

ACKNOWLEDGEMENT: Mr. Mike McGrane, Royal Glamorgan Hospital.

REFERENCES

1. Point of Care Testing: the use of diagnostic equipment and procedures outside the diagnostic laboratory. WSAC. February 2004. WHC(2004)005. Available within NHS Wales on HOWIS at http://howis.wales.nhs.uk/doclib/whc-2004-005-e.pdf
2. Guidelines on Point of Care Testing. RCPath. October 2004. Available at: http://www.rcpath.org.uk/resources/pdf/Point-of-CareTesting-updatedOct04.pdf

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APPENDIX Calendar of audit process for standards for use of multiple blood gas analysers

May 2003 Findings of survey of 15 Welsh biochemistry laboratories, undertaken by Mr M McGrane (Royal Glamorgan Hospital, Llantrisant), presented at an All Wales Clinical Biochemistry Audit Group meeting in Swansea.

2003-2004 Initial draft standards prepared by Mr M McGrane and considered at an audit group committee meeting.

April 2004 Draft standards presented by Mr M McGrane at an audit meeting in Llanelli.

2004-2005 Further draft standards prepared and sent for consultation to clinical biochemists within Wales to seek their views.

May 2005 Standards ratified at All Wales Clinical Biochemistry Audit Group committee meeting on 19th May 2005 by Dr K Griffiths (chairman).