

Preliminary evaluation of a new handheld point-of-care blood gas analyser using 50 canine blood samples

West, E., Bardell, D., Senior, M.

Philip Leverhulme Equine Hospital, University of Liverpool, Leahurst, Chester High Road, Neston, Cheshire CH64 7TE, United Kingdom

Blood gas analysis is valuable for conscious and anaesthetised dogs. This study evaluated the accuracy and precision of a new point-of-care analyser (EPOC Analyser) compared with a standard handheld analyser (i-STAT Analyser).

Following informed owner consent, left over blood from clinical samples was obtained from 35 dogs. To evaluate agreement, arterial ($n=15$) and venous ($n=35$) blood samples were analysed on both machines simultaneously. Lactate was compared between EPOC and Accutrend systems. Precision of EPOC was evaluated by repeated analysis of 10 samples, stored anaerobically at room temperature between analyses for 310 ± 96 seconds. Agreement was evaluated using Bland-Altman analysis and precision using coefficient of variation (CV%).

Data are presented as bias (limits of agreement) and CV% (Table 1). Agreement with published guidelines (Ehrmeyer et al. 1990), or within 2 SD of reference machine mean, was found for all parameters. Precision of EPOC measurements were $<10\%$, except for base excess and lactate where absolute values were low. Incidence of cartridge failure was 3 and 4 for i-STAT and EPOC, respectively.

Preliminary results indicate that the EPOC analyser produces clinically acceptable agreement for all parameters compared with a standard handheld blood gas analyser.

Table 1 Bias (i-STAT minus EPOC), limits of agreement and precision (coefficient of variation, CV%) of the EPOC Analyser

	Bias	Limits of agreement	Precision of EPOC (CV %)
pH	-0.03	0.04	0.06
PCO ₂ (kPa)	0.14	0.82	2.50
PO ₂ (kPa)	-0.64	3.84	5.07
Bicarbonate (mmol l ⁻¹)	-0.95	2.37	1.75
Base excess extracellular fluid	-1.42	2.58	16.40
SO ₂ (%)	-1.31	8.55	0.45
Haematocrit (%)	-0.21	10.29	2.75
Haemoglobin (g dl ⁻¹)	-0.08	3.48	2.53
Glucose (mmol l ⁻¹)	-0.37	0.45	1.62
Ionised calcium (mmol l ⁻¹)	-0.04	0.09	1.23
Lactate (mmol l ⁻¹)	0.39	1.30	11.33
Potassium (mmol l ⁻¹)	-0.14	0.18	0.18
Sodium (mmol l ⁻¹)	-3.52	4.49	0.48

We gratefully acknowledge Woodley Equipment Ltd for the loan of the analysers and associated consumables used in this study.

Ehrmeyer SS, Laessing RH, Leinweber JE, Oryall JJ (1990) 1990 Medicare/CLIA Final Rules for Proficiency Testing: Minimum Intralaboratory Performance Characteristics (CV and Bias) Needed to Pass. Clin Chem 30, 1736-1740.