AVOIDING PREANALYTICAL ERRORS IN BLOOD GAS TESTING WITH A SMARTPHONE APP

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Abstract

Preanalytical errors are said to be the reason for up to 62% of all errors in laboratory medicine [1]. The diagnostic consequences depend on the magnitude of the preanalytical error. In worst case, these errors may lead to mistreatment of patients; in all cases, these errors are an extra workload for the hospital staff involved [2]. Several aspects of blood pH and gas analysis are unique among clinical and laboratory determinations, at the same time, no other test results have more immediate impact on patient care [3]. Therefore, how you handle the preanalytical phase – especially when doing blood gas testing – directly impacts patient safety. A new mobile app from Radiometer called ***Blood gas – Preanalytics*** *provides training on the preanalytical phase of blood gas testing and tips on how to avoid errors. The recommendations are based on existing literature and international best practices.*

Keywords

Blood gas testing, preanalytics, preanalytical errors

Smartphone app to help reduce the risk of errors

A new mobile app from Radiometer provides training on the preanalytical phase of blood gas testing and tips on how to avoid errors. The recommendations are based on existing literature and international best practices. The app is intended for nurses, doctors and others in charge of drawing blood gas samples from patients.

About the app

The *Blood gas – Preanalytics* smartphone app is divided into a handbook, troubleshooting guide and a skill test.

The handbook covers the areas in blood gas testing where preanalytical errors are most likely to occur, e.g. during sampling, sample mixing and storage. Content, which includes how-to videos, is divided into arterial puncture, arterial line and capillary sampling.

The second section of the app is an interactive troubleshooting guide. Preanalytical errors can affect patient values on certain blood gas and related parameters. With the troubleshooting guide, users can check whether an excessively high or excessively low parameter value may be linked to a preanalytical error, and if so, which one(s).

Finally, the app offers a skill test within arterial puncture, arterial line and capillary sampling, where users can test their knowledge on preanalytical errors.

Educational tool

The goal of the app is twofold: make recommendations based on existing literature and international best practices available to users in an interactive, easy-to-use format; and at the same time educate and enable users to take proactive steps themselves in avoiding these errors.

Particularly the Troubleshooting feature is popular. If a patient value in blood gas or a related parameter is too high or too low, users can check which preanalytical error may be potentially causing the outlying value.

Fig. 1: Screenshot of the Handbook section in the Blood gas – Preanalytics app for the iPhone.

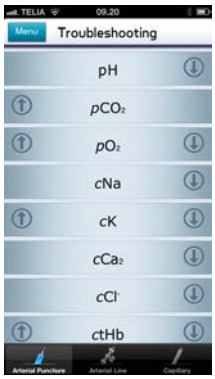

Fig. 2: Screenshot of the Troubleshooting section in the Blood gas – Preanalytics app for the iPhone

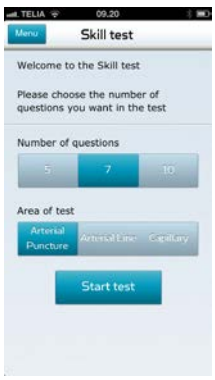

Fig. 3: Screenshot of the Skill test section in the Blood gas – Preanalytics app for the iPhone.

Acknowledgements

The app was developed by Radiometer's Scientific Affairs, Training and MarCom departments led by the paper's two authors, and with the help of the Danish web agency Trifork. Radiometer is a leading provider of technologically advanced acute care solutions within blood gas analysis, transcutaneous monitoring and immunoassay testing.

Conclusion

The *Blood gas – Preanalytics* app is currently available in English, Spanish, German and French. The app is available free of charge for iPhone, Android and Windows Phone. Users who do not have a smartphone can access the content of the app in English at www.avoidpreanalyticalerrors.com.

To date, more than 12,000 users from around the world have downloaded the app across the three mobile platforms. Downloads from the US (12%), Mexico (10%) and Germany (7%) account for one-third of all downloads. User feedback has so far been positive and the app is being used for internal hospital training purposes.

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