A web-accessible computer application for teaching arterial blood gas (ABG) interpretation

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Rationale: Seasoned respiratory care practitioners (RCPs) are frequently called upon to function as preceptors to junior practitioners and students in an effort to teach the latter the intricacies of arterial blood gas (ABG) interpretation.

Methods: A web-accessible computer application (“app”) has been created to essentially serve as an electronic “preceptor’s assistant”. This app, the “Acid-Base CLINIMApp™”, is accessible using any handheld, tablet, lap-top, or desktop computer, as well as any smartphone, which incorporates browser software (URL: www.clinimapp.com). It is based on the so-called tri-axial representation of acid-base equilibrium. In response to feedback received over the past two years from various clinicians, the app has been modified in order to render it more “user-friendly”.

Results: The Acid-Base CLINIMApp has proven to be very popular with respiratory therapy (RT) students, as well as graduate RCPs and registered nurses (RNs).

Conclusions: One’s ability to ascertain the acid-base derangement, if any, which applies to any patient is an important component of the skills inventory of bedside practitioners. Consequently, it is crucial that each member of the care team be conversant with the concepts and principles of ABG interpretation. The availability of “millenial-approved” teaching tools can be uniquely effective in teaching new graduates who are already extremely fluent with computer software. The functionality of the app will be demonstrated by means of screen-capture software to enable attendees of this presentation to evaluate the potential utility of this electronic tool in their own practice.

References:

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A screenshot of an image generated by the app

This graphic depicts a screen shot of the Acid-Base Triangle Map generated by the app after the user had keyed in 62 torr and 27 mEq/l for the prevailing pCO2 and [HCO3-], respectively. Under computer control, the app has scribbled a blue line corresponding to the pCO2, a red line corresponding to the [HCO3-], and a vertical black line, corresponding to the resulting [H+] value of 55 mEq/l. The black line also traverses the (green) pH axis, indicating that the prevailing pH is 7.26. Notice that the point of intersection of the three lines lies within the (yellow) region which is labelled “partially compensated respiratory acidemia”.

If you wish to implement the app as a component of your own teaching activities, navigate to the following universal resource locator (URL): www.clinimapp.com

If you wish to view a twenty-six-minute video which explores the physiology upon which the app is based, navigate to: http://www.ambulatorypractice.org/education-research/respiratory-therapy/education/acid-base-clinimapp

A handout, a verbatim script of the movie’s audio track, and a Post-Test are also downloadable from that site, as is the video itself. The video is written as an “.mv” file and will play on an iPod (Apple, Inc., Cupertino, CA) tablet computer.

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