

## **Obstetric Anesthesia App: Development of a Mobile Application for Obstetrical Anesthesia Education**

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**Introduction:** The obstetrical anesthesia rotation is a unique experience in anesthesiology training. There are special considerations for complications, physiology, anatomy and pharmacologic agents. Furthermore, anesthesiologists care for both the mother and fetus at once. Among residents, these considerations are commonly addressed by independent study, or by consulting senior providers and reference materials. Independent study is a staple in resident learning; however learners may have difficulty prioritizing learning topics prior to gaining experience first. Consulting more experienced clinicians provides useful and targeted information, but these providers are not always immediately available. References such as review books and notes may be difficult to organize and carry at all times. Mobile applications have a virtually unlimited capacity for holding clinically relevant information, without increasing bulk or being otherwise difficult to carry. We sought to develop a mobile application to serve as a reference for anesthesia trainees.

**Methods:** The Android and iOS applications were developed with React Native, a framework with the tagline “learn once, write anywhere.” The underlying logic and graphical implementation was written in JavaScript which runs in a background WebView. Distinct from platforms like Cordova and Ionic, native components are drawn on the screen, as opposed to drawing web components into a WebView. A separate program was developed for updating content based on the Electron framework. We created content for the application based on needs discussed in interviews with providers, our personal experience and the established educational topics at our institution. We store all application content on Google Firebase and distribute the application directly to mobile devices.

**Results:** We developed a cross-platform application for use by trainees. Clinicians may easily update the application using software we created for administration of the app. This allows changes without needing to know the details of the underlying implementation. Storing content on Google Firebase allows for immediate propagation of updates to all devices. This foregoes delays with acquiring app-store approval for future updates, as content is dynamically downloaded from highly-available servers without requiring upgrades. All content updates are reflected in the app in real-time.

**Conclusion:** Mobile applications can be viable teaching tools for residents. With real-time databases content can be changed quickly, keeping it up-to-date and allowing for timely correction of errata. With the ubiquity of mobile phones among residents, mobile applications are still underutilized and provide an opportunity to improve resident education. This app will provide evidence-based obstetric anesthesiology clinical information, drug summaries, calculators and more for educating residents and for use at the point-of-care in labor ward. Future enhancements include providing links to Washington University in St. Louis library-subscribed obstetric anesthesiology journals and textbooks in a browsable format on iPad, iPhone or Android tablet and interactive quizzes.