REVIEW ARTICLE

# Mobile Apps for Point-of-Care Calculations, Warfarin Nomogram & Following Guidelines

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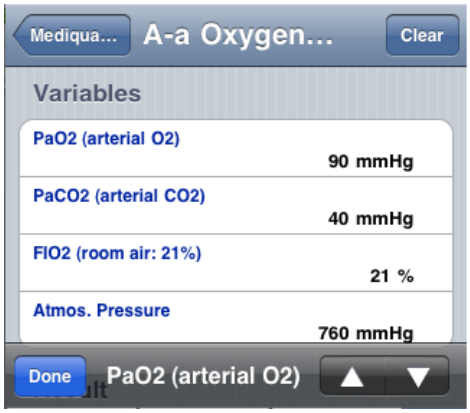
Research into evidence-based medicine has yielded a large number of clinical calculators and nomograms to aid physicians with the care of patients. This article describes three apps that make these evidence-based tools easily accessible and readily available at the point of care of the patient.

## MEDIQUATIONS

Evidence-based medicine has revolutionized the knowledge base of medicine. The challenge lies with how to bring this knowledge to the point of care.[1] The invention of mobile apps has brought a means to allow the use of this powerful knowledge easily at the point of care. One prodigious app that allows for point of care application is Mediquations.




Mediquations is intuitive and a simple to use. It contains 232 medical calculations that include the most common equations a family physician would want to employ. The app costs $4.99 for all of the medical equations and is available in the iTunes App Store. It is a simple and fast way to calculate, using everything from the PHQ-9 Patient Health Questionnaire to the Modified Centor score for Streptococcal pharyngitis. The app also provides quick access to original peer-reviewed articles, where calculations have been validated, with a clickable link to view them in PubMed or other respective website. The app has an exceptional built-in search tool that allows easy access for evidence-based calculators that the clinician might need. For instance, a search for alcohol yields calculators for the alcoholic hepatitis discriminant score, CAGE questionnaire, CIWA-Ar alcohol scale, and the Glasgow Alcohol Hepatitis Score. Mediquations gives a large number of accessible medical equations that are appropriately referenced. It is arguably the easiest to use and is significantly better than the free options, such as using the internet for the individual equations Mediquations gives a large number of accessible medical equations that are appropriately referenced. It is arguably the easiest to use and is significantly better than the free options, such as using the Internet for the individual equations.

The calculators are easy to use. Each calculator allows for quick entry of patient characteristics in logical ways. The scores are calculated instantly and the results are shown in the same pane. Each calculator has a built-in note section where the clinician can add notes. It also has a "Favorites" and a "Recents" tab that makes it convenient to access calculators commonly used in an individualized practice setting. Over time this feature becomes invaluable; the clinician is able to index the calculators he needs most often and eliminate the need for repeated searches.

## WARFARINGUIDE

Warfarin is arguably one of the most dangerous medications that physicians prescribe.[2] It has now been used for clinical purposes for over 50 years, and is still one of the most commonly prescribed medications in the United States.[3] While there are a number of newer anticoagulants that do not require monitoring of a patient's international normalized ratio (INR), they are not approved for all indications that require anticoagulation (such as prosthetic valves) and cost about five times as much as warfarin.[4]

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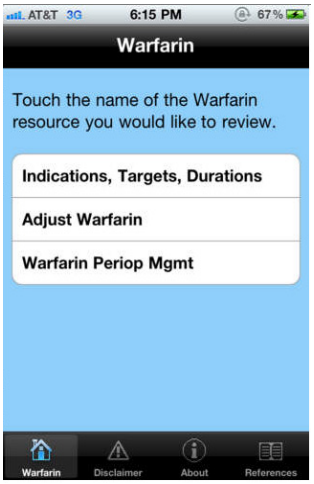
Since 2012, the American College of Chest Physicians guidelines have recommended that for dosing decisions, physicians use "validated decision support tools (paper nomograms or computerized dosing programs) rather than no decision support".[5] However, paper-based nomograms are frequently not convenient to use, counter-intuitive, and not available at the point of care of the clinician.

One solution is WarfarinGuide[6], a free app available on the iTunes App Store. It offers an easy-to-use nomogram that assists in dosing decisions. It gives information on initial dosing. For patients who are on Warfarin, it asks the clinician to tap on the desired goal (2.0 to 3.0 or 2.5 to 3.5), and then asks for the most recent result with common ranges. When this range is selected, it gives the recommended adjustment recommendation (if any) to the patients warfarin dosing as well as recommendations for when to repeat INR testing, consistent with current evidence-based guidelines. Even though you may approach patient treatment differently, this app allows for practical use of accepted standards of care. This should help the family physician supplement their base knowledge, allowing for enhanced clinical practice and optimal patient care.




## ePSS (ELECTRONIC PREVENTIVE SERVICES SELECTOR)

Modern healthcare hinges on providing preventative healthcare to our patients. Adhering to guidelines and recommendations of the U.S. Preventive Services Task Force (USPSTF) can be challenging, especially at the point of care. ePSS is an excellent app by the Agency for Healthcare Research and Quality (AHRQ) and is available free of charge on iPhone, iPad, Android devices, Blackberry and Windows devices. It can also be accessed by a web browser.

The app offers an intuitive user interface, utilizing a combination of five questions: age, sex, pregnancy status, tobacco use, and sexual activity status to provide targeted guidelines. The guidelines are divided into grades A, B, C, and D. Grades A and B are "Recommended", whereas D is "Not Recommended". Category C falls in the realm of "Uncertain".

The developer has provided ability to "Save Searches" for quick access to common demographics based on individual practitioner preference. It also offers a "Bookmark" feature to provide reference to frequently used guidelines and an ability to curate them to your needs. The app has a hidden gem in the "Tools" section, which houses it has a collection of validated tools ranging from depression scale to stroke calculator. These are very important and practical tools that further improve the ease of use in a point of care setting.

The app also has very good documentation, including a "FAQ" (frequently asked questions) section; "What's New" section and "Instructions for Use". The user can choose to subscribe to updates via email as well.

Overall, ePSS is a robust app with a well-designed user interface; excellent documentation and several practical tools make it an essential companion for every clinician.

These apps offer unprecedented ease for the family physician to access evidence-based decision support tools at the point of care.

## REFERENCES

1. J. Med Internet Res. 2010 Jul-Sep; 12(3):e26.
2. Blood 2008 May; 111:4471.
3. Goodman & Gilman's The Pharmacological Basis of Therapeutics, 12e.
4. Prescriber's Letter 2011; 18(12):271220.
5. Chest 2012; 141:7S-47S.

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**1. c 2. d 3. a 4. d 5. c 6. c 7.b 8. c 9. d 10. a**