

Smartphones : An Innovative Guide for Healthcare Professionals

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ABSTRACT

Mobile phones have been widely used since many decades, but the smartphones are a more recent advance. The latest generations of smartphones are increasingly viewed as handheld computers rather than as just mobile phones, due to their more advanced computing capability and open operating systems that encourage application download and development. In a relatively short period of time, smartphone technology has penetrated significantly into society from school children to senior citizens. The level of smartphone usage by medical students and professionals is increasing day by day with the extensive availability of downloadable medical applications related to medical education and health. The purpose of this article is to provide brief knowledge about the useful and popular smartphone applications for medical students and practitioners which help to integrate technology into clinical practice.

KEYWORDS: Applications, Health care professionals, Smart phone

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INTRODUCTION

The latest generations of smartphones are increasingly viewed as handheld computers rather than as mobile phones, due to their more advanced computing capability, connectivity than basic feature phones and open operating systems that encourage application development.¹ Smartphones are now providing regular access to information in ways that were previously not possible, this includes the area of medical education.

In a relatively short period of time, smartphone has penetrated significantly into civilization, capturing an entire age spectrum of subscribers. Smartphone technology is changing the way that the medicine is learnt and practiced. Now users are more likely to access useful, regularly updated, web-based literature than refer to hard bound copies of books or journals.²

The most common mobile operating systems (OS) used by modern smartphones include Google's Android, Samsung's Bada, Nokia's Symbian, Microsoft's Windows Phone, Apple's iOS, Hewlett-Packard's web OS, and embedded Linux distributions such as Maemo and MeeGo. Among these, smartphones with Google's Android and Apple's iOS are very commonly used. Android platform is very popular and has market share of 43% compared with Apple iOS having 28% of market share.³ The mobile phone provides an essential "anytime, anywhere" connectivity into the entire world wide web of knowledge. Such continuous connectivity has important implications for use in education, healthcare and medicine. Mobile

Several studies have evaluated the use of smartphones to support healthcare and public health interventions, especially in the collection and collation of data for healthcare research, healthcare, education and clinical practice in the community.⁵

health (mhealth) apps are on the rise, with many medical students, clinicians and allied health workers adopting smartphone mobile health apps successfully in their practices. The Smartphone apps are self-contained software applications that can be downloaded by and run from these smartphones.⁴

These phones can also be used for support telemedicine and remote healthcare in developing nations.⁶ Patients too are accessing health information, maintaining contact with their healthcare providers and actively participating in their own care (participatory healthcare) through smartphones.⁷ In some of the medical schools such as Georgetown Medical School in the USA, is now requiring every medical student to have an iPhone.⁸ Smartphones are therefore useful to the medical and health related professions because they are quick on the trigger, handheld, easy

to use and can be used on the move. The level of smartphone usage by medical professionals seems to be increasing exponentially day by day. Now apps are available for all manner of medical conditions, from resuscitation to pedometers.

SMARTPHONE APPLICATION FOR MEDICAL STUDENTS AND PRACTITIONERS

Part of very popular and useful smartphone apps are listed below :

From Android Market:

1. Speed muscles MD, Speed bones MD, Speed Angiology MD, Speed Anatomy quiz, Speed Anatomy quiz:

These apps are useful for students who are studying Anatomy. They are apps which test the speed and memory of identifying the muscles, bones, arteries, veins in the body. Speed Anatomy quiz tests the speed and challenges your knowledge of human anatomy.

2. Medical encyclopedia - is a comprehensive medical reference from the University of Maryland Medical Center. It accommodates more than 50,000 pages of medical information in detail.

3. PubMed mobile pro – PubMed pro is simplified, mobile friendly Web interface to access PubMed provided by this application. PubMed comprises more than millions of citations for thousands of biomedical literature from life sciences journals, Medline and online books. Many citations include abstracts.

4. Medscape- The physicians, medical students and other healthcare professionals commonly use the Medscape, the leading medical resource for the clinical information. Tremendous features available in this app like it provides medical news, Drug information, Disease and condition information, Medical calculators, Continuing medical education courses and many more.

5. Medscape from WebMD- It offers a huge drug reference library, a disease library, procedures and decorum, and a drug interaction checker. These are grouped with their own menus, and subdivided by different body system. One can explore the directories of doctors, hospitals, and pharmacies; medical news articles. Finally, for future reference all of

the articles can be saved, so can collect and keep the pieces of information that matter the most.

6. MedPage today mobile - This app is for physicians and other healthcare professionals. It puts breaking medical news and Continuing Medical Education (CME) credits at your fingertips, with everyday coverage of over 30 specialties and yearly coverage of over 60 meetings and symposia. Physicians that provide a clinical perspective on the breaking medical news that their patients are reading through only this service. Co-developed by MedPage Today and the University of Pennsylvania School of Medicine, Office of CME offers physicians and other healthcare professionals CME credits at no cost by completing electronic educational programs.

7. MedCalc – It is a free medical calculator that gives easy access to a wide array of medical formulas and scores. The detailed information and bibliographic references for each formula is included in MedCalc application.

8. Drug infusion - An intravenous medication drip rate calculator designed for the doctors who work in the intensive care unit. This ensures accurate calculations of dose, concentration or rate of infusion, and offers both weight-based and non-weight-based calculations with unit conversion flexibility.

9. Quick LabRef- It provides quick look at the up-to-date information on the most commonly used clinical laboratory values and other useful relevant information such as lab data in Microbiology, Physiology / Pathophysiology, Toxicology and etc. For reference normal values are provided in both Conventional Units (CU) and in units of the “Système International” (SI).

10. Eponyms - It allows for quick look up, the meaning of more than 1700 medical eponyms using full text search or by selecting from one of 28 categories. One can make a starred list of eponyms to track those they tend to forget, which will be very useful for medical students.

11. Taber's medical dictionary - Taber's is the leading medical dictionary used by healthcare professionals. This app contains more than 60,000 terms, 1,000 photos. It also has medical symbols and units of measurement, immunization schedules, abbreviations, nursing diagnoses, and more.

12. Drugs dictionary – Drugs dictionary is very useful application that allows you to search for information related to the active drug: uses, how to take, side effects, precautions, missed dose, storage.

13. Disease Handbook – It is a complete disease book which provides actual information about diseases, disease symptoms, disease causes, and much more. It is helpful for all medicals which want the meaning of particular disease.

14. Sanford guide- It is the essential resource for healthcare professionals who care for patients with infectious diseases. This application produces fast, convenient access to critical information on treatment of infectious diseases, for timely and effective decisions at the point of care.

15. Epocrates- It offers a free drug reference application—Epocrates Rx—featuring thousands of drug-drug interaction checker, pill identifier, drug monographs and health plan formula rises. Premium applications—Epocrates Essentials, Epocrates Essentials Deluxe, and Epocrates Rx Pro—include

additional features such as disease information, billing codes and more.

16. Prognosis: Your Diagnosis – It is designed with busy physicians in mind which presents an engaging series of clinical case scenarios which assess the decision making skills of the player. It takes only few minutes to play each clinical cases scenario, and is associated with a comprehensive yet concise discussion of the diagnostic thinking involved, and the main lessons applicable to everyday practice.

17. My pregnancy today- This app is brought out by BabyCenter, one of the faithful parenting resource, supporting 25 million women worldwide. It is useful for pregnant women. By entering the baby's due date, the smartphone will be converted into an expert guide for your exact day of pregnancy. This application can be used to get the answers what you need, at any time.

18. I'm Expecting - Pregnancy App- The comprehensive pregnancy app from the world's largest online health community. It helps to keep track of everything that's happening to the mother and the baby. Weekly updates of the baby's growth track the symptoms and compare them to other pregnant women to see how common they are, get answers to your questions.

19. WomanLog Calendar- WomanLog is a menstrual and fertility calendar for women. It may help the infertile couple for knowing the fertile period.

From Apple's iOS:

1. Peds anesthesia - On launching this app, the user is prompted to enter the patient's age, weight and fasting time. Once you enter the above information, five icons are given:

- Endotracheal tube sizing tool – based on patient's finger size.
- IntraOp crystalloid calculator – giving a maintenance rate, based on the 4-2-1 rule, and allowing the user to input insensible and blood losses to generate an hourly total.
- PreOp sedation – doses of oral ketamine, midazolam, and nasal dexmedetomidine.
- Age appropriate vitals – heart and respiratory rate and blood pressure.
- IntraOp Medications – giving calculated doses, with references, of common anesthetic drugs, divided into induction; muscle relaxant; pain medications; and STAT drugs and Misc.

2. Drug calc: Drug calc app is very simple to use and easy to navigate, which allows weight to be calculated if unknown. One excellent feature is the 'Press in an emergency' button, which puts essential resuscitation information only two button presses away. This takes the user, via an age selection button to basic resuscitation information (epinephrine and atropine doses, endotracheal tube size, fluid bolus, and DC shock). The main part of the app is accessed via three icons at the bottom of the screen:

- Normal Values – heart and respiratory rate, blood pressure, hemoglobin, and blood volume.
- Equipment – sizes of endotracheal tube and laryngeal mask airway, fluid maintenance and DC shock power.
- Drugs – alphabetical list, with 'quick links' to each letter and the ability to select 'favorites' from the list. The initial alphabetical list shows the calculated dose to be given, with more information available when the individual drug is selected.

3. Draw MD series: It is a patient education app. This app enables doctors to communicate better with their patients and helps improve the doctor patient relationship. The app enables doctors to draw out surgical procedures to their patients in a palatable manner. The series contains nine apps, with seven specialties covered: Cardiology, General Surgery, Orthopedic Surgery, obstetrics and gynaecology, ENT, Urology, and anaesthesia.

4. Radiology 2.0- The app contains 65 Radiology cases that pertain to Emergency Medicine, but one can use the knowledge that for almost every other specialty.

4. ECG Guide- This is a teaching guide to ECG interpretation with examples.

5. Paeds ED- This app helps to calculate Age / weight / situation-specific paediatric drug and dosage which will be helpful for paediatricians and students for dosage calculation.

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