

## **How to Harness the Power of the Possible: Mobile Point of Care Information**

KIMBERLEY LAMARCHE & SARAH NICOL

### **Abstract**

Mobile technology and hand-held communication devices are now a significant part of life for many Canadians. The data is clear; nurses and nursing students have access to appropriate technology like never before. The profession is harnessing the power of technology to access and improve care and knowledge. A recent study by Doran et al (2010) added to the knowledge base found that “It is feasible to provide nurses with access to evidence –based practice resources via mobile information technologies to reduce the barriers to research utilization”. The question is where to start? This article is aimed at assisting the novice mobile user, or the expert social network user to harness the possible power of the technology to improve patient care at the point of care. Concrete examples of applications will be provided to illustrate what is possible, acknowledging that new applications and platforms are emerging daily. Specific attention is provided to student centered applications as well as primary health care applications for practice based nursing professionals, focusing on advanced practice. The concept of harnessing the power of point of care information is not only exciting, but essential in this digital age. It is urgent that we understand how to adopt the use of these devices and to understand the barriers that we face. The power of what is possible with mobile technologies can be staggering; however taking the first step can be far less daunting.



Mobile technology and hand-held communication devices are now a significant part of life for many Canadians. They afford both unprecedented communication opportunities (individual, group and mass) anywhere, anytime and creative new services are offered from amateur creators to gigantic corporations. Research about the influence and contribution of mobile communication devices to Canadian life is still emerging. There is a change to Canadian culture that has

presented itself well ahead of our understanding. This is particularly so in relation to the impact mobile devices may have on those who are engaged in formal learning (Doran, Haynes, Kushniruk, Straus, Grimshaw, Hall & Jedras, 2010).

The widespread adoption of mobile wireless technology in the form of cell phones, personal digital assistants (PDAs), laptop computers, and MP3 players is now irrefutable (Wagner, 2005). A recent US survey asked almost 4,000 nurses about their use of smartphones and reported that 71% use a smartphone for their job (Dolan, 2012). Current mobile technologies - especially third generation (3G) wireless devices such as the Apple iPhone and Google Android cell phone - provide an unprecedented opportunity for inexpensive and beneficial computing power for learners (Hill & Roldan, 2005; Wagner, 2005). Although not specific to nursing, IAB Canada (2010) recently released Canadian mobile statistics; 85% own cell phones, 50% of cell customers have monthly data access. Of these data subscribers they report the top four mobile activities as downloading apps (85%), browsing (75%), emailing and accessing Social Networks/Blogs.

Mobile technology and hand-held communication devices have revolutionized the lives of many Canadians. Technology has afforded unprecedented opportunities for communication. Research about the influence and contribution of mobile communication devices to Canadian life is still emerging. Understanding how technology has and is influencing Canadian culture and formal education is ongoing.

The data is clear; nurses and nursing students have access to appropriate technology like never before. The profession is harnessing the power of technology to access and improve care and knowledge. A recent study by Doran et al (2010) added to the knowledge base found that "It is feasible to provide nurses with access to evidence-based practice resources via mobile information technologies to reduce the barriers to research utilization". The question is where to start? This article is aimed at assisting the novice mobile user, or the expert social network user to harness the possible power of the technology to improve patient care at the point of care. Concrete examples of applications will be provided to illustrate what is possible, acknowledging that new applications and platforms are emerging daily. Specific attention is provided to




student centered applications as well as primary health care applications for practice based nursing professionals.

Mobile technologies have been used broadly across sectors to provide goods and services to consumers and have revolutionized how organizations and individuals go about their daily activities (Ally & Palalas, 2011). Mobile devices are significantly changing human–computer interaction, communication, and learning activities. Ubiquitous access to remote resources is one of the most interesting characteristics achievable by using mobile or handheld devices (Liaw, Hatala & Huang, 2009).

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When making the transition from paper based resource information searching to mobile connecting there are many elements to consider. Once the hardware has been selected, the next option to consider is pre-packaged resource bundles. When considering the adoption of these resources professionals must consider the primary reason for adoption. Patient safety has been identified as the paramount reason for introducing mobile technology (Yoost, 2011). Although there are limited free bundled packages, the investment may prove valuable at the point of care. Prior to purchase, check to see if the application offers free trials to users or if your employers/education institution has a pre purchased group license to share. Table one presents some examples of common bundled packages and comprehensive mobile solutions packages. Items identified with a maple leaf are Canadian in origin.


**Table 1: Comprehensive mobile applications/packages**

Application	Location	Comments
Unbound Medicine	<a href="http://www.unboundmedicine.com/products/nursing">http://www.unboundmedicine.com/products/nursing</a>	Nursing Central or Medicine Central
Up to Date	<a href="http://www.uptodate.com/home/about/mobile-access.html">http://www.uptodate.com/home/about/mobile-access.html</a>	Evidence-based clinical decision support system authored by physicians to help clinicians make the right decisions at the point of care. All Up To Date content is written and edited by a global community of 5,100 physicians, world-renowned experts in their specialties
Towards Optimized Practice 	<a href="http://www.topalbertadoctors.com">www.topalbertadoctors.com</a>	Complimentary downloads including Canadian clinical practice guidelines and practice management tools offered to assist physicians and healthcare professionals
RNAO Best Practice Guidelines 	<a href="http://nao.ca/bpg/pda">http://nao.ca/bpg/pda</a>	Comprehensive bilingual compilation of nursing practice guidelines; unique feature includes a video to assist in implementation of the resources into your practice
Skyscape	<a href="http://www.skyscape.com">http://www.skyscape.com</a>	Includes over 200 nursing texts in mobile format for purchase. Select medical applications (RX drugs, Archimedes, Outlines & MedAlert) available for free
Lexicomp	<a href="http://www.lexicomp.com">www.lexicomp.com</a>	Concentrates on drug information software
Pepid	<a href="http://www.pepid.com">www.pepid.com</a>	Offers free 14 day trial
NurseONE 	<a href="http://www.nurseone.ca">www.nurseone.ca</a>	Web-based service providing up-to-date credible health information. Developed in partnership with the Canadian Nurses Association, Health Canada, and the First Nations and Inuit Health Branch of Health Canada. Excellent library including mobile access. Free for most Canadian nurses/nursing students

Dolan (2012) reported in a recent US survey that 66% respondent reported using a smartphone for nursing school. Although to the some in the academy these devices may seem like a distraction or nuisance, it has been reported that students can be more actively engaged in learning both in the classroom and in clinical rotations by incorporating mobile technology (Yoost, 2011). Table two represents a sample of

commonly used nursing student applications, both for basic undergraduate and advanced practice students.



**Table 2: Student specific mobile applications**


Application	Location	Comments
Prognosis	<a href="http://www.prognosisapp.com/">http://www.prognosisapp.com/</a>	Free, fun and interactive case studies added each week
OSCE trainer	<a href="http://www.one2onemedicine.com/pages/view/17">http://www.one2onemedicine.com/pages/view/17</a>	63 free mock OSCE sheets available in practice and test mode
CVD Risk Check 	<a href="http://www.cvdriskcheck.com/">http://www.cvdriskcheck.com/</a>	Free bilingual cardiovascular risk assessment tool
Lippincott's Anatomy Q & A	<a href="http://itunes.apple.com/ca/app/moores-clinical-anatomy-q-a/id404004091?mt=8">http://itunes.apple.com/ca/app/moores-clinical-anatomy-q-a/id404004091?mt=8</a>	Anatomy quiz app which lets you create your own testing based on established questions
MyCME	<a href="http://www.mycme.com/mycme-app/section/2670/">http://www.mycme.com/mycme-app/section/2670/</a>	Free access to hundreds of continuing medical education activities
Medical History & Physical Exam	<a href="http://getipa.info/index.php?content3=games&amp;game=10211">http://getipa.info/index.php?content3=games&amp;game=10211</a>	Pocket guide offering a clear structured and systematic approach to history taking and physical exam
Case Hx	<a href="http://www.smartddx.com/">http://www.smartddx.com/</a>	A free stepwise systematic approach to conducting a case history
Anatomy	<a href="http://enlightenedlabs.com/products/ios/humananatomyapp">http://enlightenedlabs.com/products/ios/humananatomyapp</a>	Basic anatomy app available for free, includes zoom feature
Grasp Student System	<a href="http://nursing.unboundmedicine.com/nursingcentral/ub/grasp-welcome-tutorial">http://nursing.unboundmedicine.com/nursingcentral/ub/grasp-welcome-tutorial</a>	Users can search individual content channels, then link to additional content with Cross Links, define terms in-text with Glimpse™, and create study decks to share and review with Grasp™. Using Favorites, students can save specific entries for quick recall when preparing treatment plans or caring for patients.

Chocinov et al. (2011) report that when considering enhanced nursing productivity through mobile computing solutions that “the simplest concepts often make the biggest differences in patient care”. Table three provides a list of common

applications specific to practice is meant to provide a non-exhaustive list of examples of applications you can discover.

**Table 3: Practice specific mobile applications**

Application	Location	Comments
ICD9	<a href="http://itunes.apple.com/us/app/icd9-consult-2012-free/id358845668?mt=8">http://itunes.apple.com/us/app/icd9-consult-2012-free/id358845668?mt=8</a>	Free searchable database
OCP + ipc	<a href="http://itunes.apple.com/us/app/contraception-i-pocketcards/id389489400?mt=8">http://itunes.apple.com/us/app/contraception-i-pocketcards/id389489400?mt=8</a>	The Contraception pocket card set includes contraceptive information related to efficacy rates, guidelines for OCPs and progestin-only and intrauterine devices including quick start algorithms
Rh Med Labs	<a href="http://itunes.apple.com/ca/app/rh-medical-labs-normal-labs/id401631074?mt=8">http://itunes.apple.com/ca/app/rh-medical-labs-normal-labs/id401631074?mt=8</a>	Highly rated app which includes date for pregnant and pediatric patients, allows search according to age and sex
Stat Ref	<a href="http://www.statref.com/products/SRMobile.html">http://www.statref.com/products/SRMobile.html</a>	Evidence based point of care, fully searchable program. Enables users to cross-search 300+ resources. Subscription available through NurseOne
AHRQ ePSS	<a href="http://epss.ahrq.gov/PDA/index.jsp">http://epss.ahrq.gov/PDA/index.jsp</a>	Designed for primary care clinicians to identify clinical preventive services based on the U.S. Preventive Services Task Force.
CPS Essentials 	<a href="http://www.pharmacists.ca/index.cfm/function/store/ProductDetail.cfm?ProdCompanyPassed=cpa&amp;ProdCdPassed=cpa-CPSESS-MOB&amp;PriceCategPassed=std&amp;indexstart=1">http://www.pharmacists.ca/index.cfm/function/store/ProductDetail.cfm?ProdCompanyPassed=cpa&amp;ProdCdPassed=cpa-CPSESS-MOB&amp;PriceCategPassed=std&amp;indexstart=1</a>	Canadian Pharmacists Association product includes trials of text "Therapeutic Choices" and free productivity apps including Health Canada advisories among others.
PLetterC 	<a href="http://canadianpharmacistsletter.therapeuticresearch.com/content.aspx?cs=&amp;s=PLC&amp;page=content&amp;lm=apps">http://canadianpharmacistsletter.therapeuticresearch.com/content.aspx?cs=&amp;s=PLC&amp;page=content&amp;lm=apps</a>	Canadian Pharmacist Letter app includes free access to one monthly article and recommendation from <i>Pharmacist's Letter</i> , plus the details from the <i>Detail-Document</i> , <i>PL Patient Handout</i> , <i>PL Drug/Dosage Comparison Chart</i> , or Treatment Guideline.
BMI tool	<a href="https://play.google.com/store/apps/details?id=tools.bmirechner&amp;hl=en">https://play.google.com/store/apps/details?id=tools.bmirechner&amp;hl=en</a>	BMI calculation tool
Flashlight	<a href="http://www.freewarelovers.com/android/app/flashlight">http://www.freewarelovers.com/android/app/flashlight</a>	Free flashlight tool
Preg Wheel & Wheel SP	<a href="http://www.iphonepregnancywheel.com/">http://www.iphonepregnancywheel.com/</a>	Actual wheel simulates hand held paper tool
RX Drugs	<a href="http://www.skyscape.com/app/rxdrugs.aspx">http://www.skyscape.com/app/rxdrugs.aspx</a>	1,600+ drug monographs including both US and international brands. Includes a pill identifier and over

		400 drug calculations
10 Year (OP Risk) 	<a href="http://www.osteoporosis.ca/multimedia/fracture-risk-tool.html">http://www.osteoporosis.ca/multimedia/fracture-risk-tool.html</a>	Free risk fracture assessment tool based on Canadian 2010 guidelines
StethoExpert	<a href="http://itunes.apple.com/us/app/istethoscope-expert-2013/id447933327?mt=8">http://itunes.apple.com/us/app/istethoscope-expert-2013/id447933327?mt=8</a>	Your device is pressed against the chest where its built-in microphone is able to pick up on the heart's beat. The user then shakes the iPhone to hear the last eight seconds of recording and see a phonocardiograph display and a spectrogram.
Eye Test	<a href="http://itunes.apple.com/us/app/eyetest/id414652461?mt=8">http://itunes.apple.com/us/app/eyetest/id414652461?mt=8</a>	Free app includes vision screening and color blindness resource
Dragon Dictation	<a href="http://www.dragonmobileapps.com/apple/dictation.html">http://www.dragonmobileapps.com/apple/dictation.html</a>	Dragon NaturallySpeaking software at your fingertips
Derm101	<a href="http://itunes.apple.com/us/app/derm101-point-of-care/id434886826?mt=8">http://itunes.apple.com/us/app/derm101-point-of-care/id434886826?mt=8</a>	Point of care resource including free trial of diagnostic and investigation of skin diseases
LactMed	<a href="http://toxnet.nlm.nih.gov/help/lactmedapp.htm">http://toxnet.nlm.nih.gov/help/lactmedapp.htm</a>	Free app which compiles a database of drugs and other chemicals to which breastfeeding mothers may be exposed
Micromedex Drug Information (Thomson reuters)	<a href="http://healthcare.thomsonreuters.com/micromedexMobile/">http://healthcare.thomsonreuters.com/micromedexMobile/</a>	Free evidence based app that includes off-label indications, dosing recommendations, therapeutic class, administration, monitoring, toxicology and clinical teaching
QR Reader	<a href="http://www.mobile-barcodes.com/qr-code-software/">http://www.mobile-barcodes.com/qr-code-software/</a>	Site includes link to popular QR downloads to allow you to scan and read mobile barcodes. Many apps are made available via QR codes

## Mobile Pitfalls and Timesavers

Using your mobile device at the point of care needs to be carefully considered both in terms of perceptions and policies. Privacy concerns related to mobile device integrated cameras or the perception that you are accessing social media while working may display the perception of unprofessional conduct. It is imperative that you use your mobile device with caution in the workplace; acknowledging your clients generation, culture and privacy.

A common pitfall for mobile users is the inability to fully appreciate and integrate timesaving and high efficiency solutions. The internet has a variety of virtual back up utilities just as there are applications available on the internet. Virtual backups are an

essential tool to harness for students and professionals alike. One such example is the service 'Dropbox' (<https://www.dropbox.com>). Dropbox can be used on both mobile devices and your computer and is available for free with up to 2GB of storage. The concept is simple; the program stores synchronized files "in the cloud" making them available on any smartphone or tablet computer with internet access. Many reference texts are now produced by industry in a downloadable format (i.e. PDF). Using a program such as Dropbox or the 'cloud' allows access to traditional texts without having them physically with you.

Utilizing a smart phone requires one to be cautious with data fees. Various data packages are available from your phone provider but it is essential to be wary of one's use. Each application used or information accessed is part of your data use. Connecting your device to a wireless network whenever possible will save valuable data usable. Invest in applications that can have access to resources without internet connection can be useful where there is no cellular or data coverage available or permitted.

As with any other investment, your mobile technology requires vigilance with password protection. Many institutions, academic and professional, have policies in place mandating access protection. Password protecting not only your phone but applications such as your virtual backup servers is essential. There are many free applications available to secure your device, applications, and resources. An example of a service which can protect from theft is Apple's 'Find My iPhone' available through Apple's iCloud ([www.icloud.com](http://www.icloud.com)), which not only can locate a lost or stolen phone, however it affords the ability to remotely wipe clean or lock your device.

In order to ensure consistency between your devices and protection of resources it is vital that you sync or back up your phones. Some providers such as Apple automatically update your devices with each connection, new adopters should be sure to investigate how their particular smartphone is backed up. This reserve can become invaluable if your device is lost or stolen, as it protects your information and can restore all data and photographs.

Ensuring your device remains safe in terms of contamination is critical when working in clinical settings. Data shows that there is a real potential for risk of transmission of microorganisms to mobile phones in the clinical setting (Sumritvanicha,



Chintanavilas & Apisarnthanarak, 2011). Alcohol pads to clean your device accompanied with proper hand hygiene should become second nature to limit to spread of infection attributable to mobile devices.

## Conclusion

The concept of harnessing the power of point of care information is not only exciting, but essential in this digital age. It is urgent that we understand how to adopt the use of these devices and to understand the barriers that we face. In a recent article discussing e-health and nursing, Wyatt and Krauskopf (2012) caution that each and every healthcare provider must take the responsibility to ensure that the technology utilized meet the standards necessary for providing quality and safe healthcare. The introduction of new programs and applications continues to evolve at an alarming pace. These initiatives have the potential to bring mobile technology and health solutions to nursing professionals. The power of what is possible with mobile technologies can be staggering; however taking the first step can be far less daunting.

**About the Authors:** *Kimberely Lamarche, RN NP, DNP, is a Primary Health Care Nurse Practitioner at the Canadian Coast Guard College in Sydney, Nova Scotia and is an Assistant Professor with Athabasca University. Contact Dr Lamarche at [lamarche@athabascau.ca](mailto:lamarche@athabascau.ca). Sarah Nicol, received her BA from The University of Waterloo and her BSc Nursing from the University of Windsor Ontario, she is currently a Nurse Practitioner student at Athabasca University. Contact Ms. Nicol at [s.liz.nicol@gmail.com](mailto:s.liz.nicol@gmail.com)*

## References

- Ally, M., & Palalas, A. (2011). *State of mobile learning in Canada and future directions*. Unpublished manuscript, Athabasca University, Athabasca, Alberta, Canada.
- IAB Canada (2010). *Mobile in Canada: A Summary of Current Facts + Trends*. Retrieved from [http://www.iabcanada.com/wp-content/uploads/2012/04/IABCanada\\_MobileInCanada\\_041012\\_FINAL.pdf](http://www.iabcanada.com/wp-content/uploads/2012/04/IABCanada_MobileInCanada_041012_FINAL.pdf)
- Chochinov, J. (2011). Enhancing nursing productivity through mobile computing solutions. *Health Management Technology*, 32(8), 9-9. Retrieved from <http://0-search.proquest.com.aupac.lib.athabascau.ca/docview/885082372?accountid=8408>
- Dolan, B. (2012). Survey: 71 percent of US nurses use smartphones. *Mobihealthnews*. Retrieved from <http://mobihealthnews.com/17172/survey-71-percent-of-us-nurses-use-smartphones/>

- Doran, D. M., Haynes, R. B., Kushniruk, A., Straus, S., Grimshaw, J., Hall, L. M., Jedras, D. (2010). Supporting evidence-based practice for nurses through information technologies. *Worldviews on Evidence-Based Nursing*, 7(1), 4-15. doi: 10.1111/j.1741-6787.2009.00179.x
- Hill, T. & Roldan, M. (2005) Toward third generation threaded discussions for mobile learning: Opportunities and challenges for ubiquitous collaborative environments. *Information Systems Frontiers*. 7(1):15-70.
- Liaw, S., Hatala, M., & Huang, H. (2010). Investigating acceptance toward mobile learning to assist individual knowledge management: Based on activity theory approach. *Computers and Education*, 54(2), 446-454. doi:[10.1016/j.compedu.2009.08.029](https://doi.org/10.1016/j.compedu.2009.08.029)
- Sumritivanicha A, Chintanavilas K., & Apisarnthanarak A. (2011). Prevalence and Type of Microorganisms Isolated from House Staff's Mobile Phones before and after Alcohol Cleaning. *Infection Control and Hospital Epidemiology*. 32(6) 6.
- Wagner.E. (2005). Enabled mobile Learning. *Educause review*. 40 (3): 40-53. Retrieved from <http://www.educause.edu/ero/article/enabling-mobile-learning>
- Wyatt, T. & Krauskopf, P. ( 2012). E-health and Nursing: Using Smartphones to Enhance Nursing Practice. *Online Journal of Nursing Informatics (OJNI)*, 16 (2). Retrieved from <http://ojni.org/issues/?p=1706>
- Yoost, B. (2011). Mobile technology & nursing education practice. *Advance for Nurses*. Retrieved from <http://nursing.advanceweb.com/Columns/Nursing->