When preparing to take professional certification examinations, critical care nurses have commonly used a variety of resources such as classic texts, study guides, or compilations of practice questions such as those found in the Critical Care Nurse “Certification Test Prep” column. In recent years, commercially produced videos of review courses and webinars have been developed for online viewing via personal computer, tablet, or smartphone. Although these traditional resources are useful, smartphone applications present a new option for CCRN certification preparation.

According to the Pew Research Center, an estimated 56% of all American adults are smartphone owners. Because these devices are lightweight and commonly carried on one’s person, for many they are constantly available. They offer the potential to experience learning through sound, motion, video, or gaming strategies to engage and motivate the user. When application designers look beyond the smartphone’s capacity to display text and harness its power as a true miniature computer, the resulting rich content and convenience can make a well-designed certification review application a valuable tool for busy nurses.

A search of Android, iPhone, and Blackberry sales sites during October 2013 revealed 11 adult CCRN review applications available for download. Versions also were available for the PCCN, adult CCRN-CMC, adult CCRN-CSC, pediatric CCRN, neonatal CCRN, and all categories of the CCNS examinations. Although not all applications are available for each operating system, most are available for both Android and iOS systems. Prices range from $1.99 to $49.99, with the majority available for less than $10.
It is not within the scope of this article to recommend or endorse any specific product. Rather, the intent is to provide an understanding of the common strengths and weaknesses of existing CCRN review applications. Readers are then supplied with a checklist to use when evaluating potential purchases.

**The Ideal Application**

At present, most certification review applications consist primarily of practice questions, which can be valuable for building test-taking skills through repetition. Indeed, the opportunity to respond to a large number of questions and consider the rationales can be an important factor for successful test-takers, particularly those with test anxiety. The best applications reviewed excel in 3 key aspects: adherence to the blueprint of the CCRN examination, cognitive level of questions, and rationales for answers.

Regarding the test blueprint, an ideal application includes numerous and varied questions from each topic listed in the CCRN Test Plan and Testable Nursing Actions found in the *CCRN Exam Handbook*. Rather than a few similar questions focused on a particular body system, the best preparation is provided by items (questions) that explore the full array of content as defined in the Test Plan. An ideal application also contains items written in a style similar to the examination, avoiding overly basic or complex information. Because the majority of CCRN examination questions are written at the application and analysis levels of Bloom’s Taxonomy, practice questions should typically mirror those categories and require learners to progress beyond rote memorization of facts. Finally, clearly written rationales are invaluable in promoting higher order thinking skills; they provide users with an understanding of why each distractor (incorrect answer) is wrong, not just why the preferred answer is correct.

One additional feature in an ideal application is an emphasis on the Professional Caring and Ethical Practice components of the AACN Synergy Model for Patient Care, which accounts for 20% of the content of the CCRN examination. Most current study applications consist of questions based solely on clinical judgment pertaining to body systems or disease processes. Although critical care nurses routinely apply concepts from the Synergy Model in their practice, such as collaboration and systems thinking, they typically have not been exposed to standardized testing on these topics. The ability to review questions from this category can be critical for a nurse unfamiliar with such items.

In addition to practice questions, a model application would also provide features to serve as a more comprehensive resource. Some current applications include a glossary of pertinent terms, a chart of normal laboratory values, or a reference guide for hemodynamic monitoring values. Several versions had drills to test basic comprehension that could be accomplished in short sessions. Others had full-length examinations with a timer to mimic real-life test conditions. Unfortunately, those developers recycled questions from the practice examinations, so the full-length examination presented only questions that the test-taker had previously seen.

**Common Weaknesses**

Of the 11 applications reviewed, most appear to have been developed by individual application developers or enthusiasts, rather than established companies. Most do not indicate if the content has been verified by knowledgeable reviewers. Neither do they cite references for the subject matter.

In an analysis of those applications, various flaws are apparent. A surprising number contain significant typographical errors and lack rudimentary proofreading for grammar and clarity. This lack of basic editing raises concern that more sophisticated publishing functions have not been performed, such as verification of the content’s accuracy. The presence of typos and gross errors in syntax should be a red flag to consumers.

Another major weakness commonly found is inclusion of material in the application that would not be tested on an official certification examination. For example, one application posed questions about the layers of the

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urinary bladder and names for types of acne. Several applications included rudimentary questions on anatomy that seemed more suitable for a basic biology course, rather than a certification examination that validates knowledge of experienced critical care nurses.

A variation on this weakness is the tendency of some developers to include information that is not expected knowledge for nurses. For example, one application contains a question in which the learner is given a list of symptoms and is expected to name the corresponding stage of acute respiratory distress syndrome (eg, phase 1, 2, 3, or 4). Although acute respiratory distress syndrome is commonly encountered in critical care nursing practice, the ability to distinguish phases or provide highly specific classification is more appropriate to a physician’s diagnosis, rather than a critical care nurse’s assessment.

Even among applications with questions that are clearly written, factually accurate, and within the scope of critical care nursing practice, most do not have questions written in a style similar to that found on the examination. A common fault is excessive reliance on questions that assess only recall or recognition of basic facts. Because certification tests evaluate higher cognitive levels beyond memorization and basic understanding, practice questions should predominantly require application and analysis of knowledge. The potential consequence of such weaknesses could be that nurses obtain a high quiz score on the application and erroneously believe that they are well-prepared for certification testing.

Searching for Quality Applications

How can consumers avoid the pitfalls described and find a suitable product? User reviews may provide some information to prompt a potential buyer to investigate further. For example, a review that states that the questions are too easy should inspire the potential buyer to carefully examine that aspect in the sample questions. However, user reviews are frequently anonymous or permit the use of pseudonyms. This situation can allow a developer to post a positive review of his own product, or a competitor to post negative reviews of the same release. Therefore, opinions found in user reviews should be weighed carefully before making a buying decision.
A number of educators have devised rubrics to evaluate education applications. Based on those tools and personal experience, a checklist for evaluating certification applications has been created for consumers (see Figure). Although no application is likely to contain all of the suggested aspects, this list can be used as a prompt for consumers to examine available features. Even though it may not be possible to discern answers to all of the factors listed before purchase, many particulars can be assessed by careful review in the “Product Details” section found on the application’s sales site.

Using this guide, first choose a sales site on the basis of the device’s operating system and then enter a search term such as “CCRN” to find potential options. Read each product description carefully, paying attention to both content and clarity of expression. Descriptions that are not professionally written or proofread are strong indicators of inferior materials. Examine the screenshots provided, noting the visual characteristics, content quality, and cognitive level. Consider the user comments, preferably detailed reviews from a credible source. Next, check the application developer’s website, since some developers provide additional details on their releases.

Only 1 vendor offers a free download of multiple sample questions, with paid in-application upgrades to a more comprehensive version. The ability to review numerous items to scrutinize quality, investigate additional features, and judge the suitability of graphics is valuable to hesitant buyers. It is unfortunate that more vendors do not offer this option, as it could be a deciding factor in their favor.

Summary

Because of the pitfalls described, critical care nurses are advised to be discriminating consumers when considering purchases of review applications. The initial cohort of CCRN review applications may be useful study adjuncts for nurses who want to test their knowledge through repetition of questions; but for now, such applications should be used only in combination with other materials, not as a sole study resource. In designing future releases, vendors would do well to employ expert clinicians and item writers to participate in application development. In the same way that certain textbooks or review courses earn a following and can charge significant fees, an excellent review application will develop a reputation as well, and its utility will become known among users. Vendors who invest significant resources into researching and designing a high-quality application could make a significant return on investment, while serving critical care nurses well.

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None reported.

Smartphone Applications: Potential Tools for Use in Preparing for CCRN Certification Examinations
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