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Apps for improving cardiac auscultation

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Cardiac auscultation skills amongst many physicians are lacking. This brief report discusses 2 mobile apps designed to improve cardiac auscultation skills.

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Physicians have been using the stethoscope for nearly 200 years since Laennec invented the device in 1813 as a physical examination tool that would overcome modesty concerns of the day.¹ Since then, the cardiac auscultation has been an integral part of the physical examination and offers important diagnostic opportunities.

Unfortunately, the cardiac auscultatory skills of many physicians are lacking. In one study,² 73.3% of healthcare providers could not identify common heart sounds. There are some who believe that cardiac auscultation will be replaced with pocket echocardiography, but with the current price of handheld echocardiography devices being more than \$5000 and the requirement of echocardiography skills, it is likely that cardiac auscultation will remain part of the physical examination armamentarium for the years ahead.³

Simulation-based cardiac auscultation has been proven to effectively teach cardiac auscultation.⁴ With the proliferation of mobile devices and apps used in medical education, there have been a number of applications that are focused on teaching and improving cardiac auscultation skills. The brief report discusses 2 important mobile apps for this purpose.

One excellent application is the Blaufuss Sound Builder by Blaufuss Medical Multimedia Laboratories, LLC. The application is currently available on the App Store and is compatible with iOS devices (iPad, iPhone, and iPod

touch). It is a free application, but to unlock most features, a \$9.99 in-app purchase is required.

The Blaufuss Sound Builder replicates nearly all conceivable common heart sounds. It is easy to use and gives the user the ability to add nearly any sound to the cardiac cycle with clickable buttons for various heart sounds (first, second, third, fourth, opening snap, holosystolic murmur, early diastolic murmur, etc.). The quality of the sounds is accurate and good. They are best heard with headphones in a quiet room, but certainly can be attached to speakers in an auditorium for teaching purposes (as the author has done on numerous occasions) with good results. It also displays a phonocardiogram at the top of the screen that visualizes any heart sound that is being replicated. This is particularly helpful in timing auscultation events with availability of the carotid pulse.

Also included in the Blaufuss Sound Builder is a differential diagnosis tool that gives a differential diagnosis with each heart sound that is generated. For instance, when a midsystolic click and late systolic murmur is generated, the differential diagnosis tool correctly lists mitral valve prolapse as one of the differential conditions.

Another key feature of the Blaufuss Sound Builder is a small compendium that is linked to displayed sounds that gives an accurate overview of key features of selected heart sounds that includes where the sound is best heard, a static phonocardiogram, and associated conditions.

Another excellent application is the 3M Littman SoundBuilder by 3M. The application is currently available on the App Store and is compatible with iOS devices (iPad,

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iPhone, and iPod touch). It is a free application with a few links to promote their stethoscopes and products. It is somewhat reminiscent of the audio CDs and tapes that were included with the purchase of Littman stethoscopes in the past, but with some key and helpful features that were not possible in an audio-only format.

The Littman SoundBuilder has 14 heart sounds that represent common or important conditions. For each heart sound, there is a brief and concise summary on the first screen for each heart sound. There is a second screen that demonstrates the best auscultation post for each heart sound. A third screen gives a phonocardiogram for each component heart sound with the ability to only hear a portion of the heart sound, such as S1, S1 + S2, S1 + Sys + S2, and the full sound. The last screen for each heart sound is probably the most useful as it is a video of an anatomically accurate and realistic rendering of a cross-section of the heart that gives the learner the ability to see the physiological process that produces the heart sound corresponding with the audio component.

The sound-building properties of the Littman SoundBuilder are not as robust as the Blaufuss Sound Builder, but

has the physiological-correlating videos are unique to the Littman app and I think adds a richness in learning and appreciating cardiac auscultation findings that is novel. The author of this article uses these apps frequently when educating physicians and students on cardiac auscultation and represents a new approach to teach cardiac auscultation.

Both of these applications offer unique and novel approaches for the family physician to improve or refresh their cardiac auscultation skills.

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