

# eMurmur Primer – CE



## App Description

The eMurmur Primer app is designed to help you better recognize benign and pathologic heart sounds and murmurs. Upon completion of the app, you will be able to identify normal heart sounds versus abnormal heart sounds, identify benign and pathologic murmurs, and differentiate between murmurs that warrant further evaluation and those that do not.

The medical content in the eMurmur Primer app is not meant to diagnose, treat, or alter medical or surgical therapy (see EULA). The primary goal is to provide an app-based tool for nurses and nurse practitioners practicing auscultation, to help them maintain and improve their listening skills.

### App Structure and Design

The design approach for the eMurmur Primer app was based on scientific research by cardiologist Dr. John P. Finley (paper reference: *International trial of online auditory training programme for distinguishing innocent and pathological murmurs*, JP Finley et al., 2015). The results of this international trial showed that through heart sound comparison and repetition, users were able to distinguish between innocent and pathological murmurs with 90% accuracy.

eMurmur Primer offers a Background Reading section and a Modules section, containing hundreds of real patient heart sounds and heart murmur recordings, each verified by cardiologists and gold-standard echocardiogram. The Background Reading section includes chapters on the heart anatomy, auscultation, heart sounds, heart defects and heart murmurs. Each chapter includes a short pre- and post-reading assessment in multiple choice format. The Modules section includes 9 modules, grouped into Fundamentals (3 modules), Intermediate (3 modules), and Advanced (3 modules). Each module is made up of training and self-testing levels in which you are presented with a series of tasks. Each task is repeated many times using different heart sound recordings on a series of screens as a way to prime your listening skills.

All progress throughout the app is automatically tracked and stored. You can stop at any time and continue where you left off. Once a module is completed, a certificate can be requested via the app. Certificates are emailed to you electronically.

### Training and Self Testing

Tasks in the training levels of the app can always be repeated at liberty and completed training levels can be re-done. When you select an answer in a training level, you are told immediately whether that answer was correct, and if not, you can try again. If you exit a training level without completion, you can re-enter at any time to continue where you left off or start over.

When doing self-testing, you will not receive immediate feedback on your answer, nor are you able to repeat a question. Once the test is complete, however, you can review your incorrect answers, listen to those recordings again, or re-take those questions. You can also always re-do a test but note that the order of sound files is randomized so it will not be the exact same test.

# eMurmur Primer – CE



## Verified Heart Murmur Recordings

Each of the heart sound and murmur recordings and descriptions in the eMurmur Primer app has been verified by experienced cardiologist reading and independent gold-standard echocardiography. All recordings are from real patients; no computer-generated sounds are used.

## Outline of App Content

The app includes a Background Reading section and a Modules section providing the following content:

### BACKGROUND READING

Chapter 1 - Heart Anatomy

Chapter 2 - Auscultation Synopsis

Chapter 3 - Heart Sounds

Chapter 4 - Heart Defects

Chapter 5 - Heart Murmurs

Completion of all background reading chapters earns you 1 CE Credit.

### MODULES

#### Fundamentals 1 - Introduction

Introduces you to the basic differences between no murmurs, innocent murmurs, and pathologic murmurs.

#### Fundamentals 2 - Breath Sounds | 2 CE Credits

Learn how to distinguish heart sounds from breath sounds.

#### Fundamentals 3 - Clicks, Splits and S4 | 2 CE Credits

Learn how to recognize clicks, splits, S4 and arrhythmias.

#### Intermediate 1 - Murmur vs No Murmur | 4 CE Credits

Train your ability to hear 'something vs nothing' and learn to hear the presence or absence of a heart murmur.

#### Intermediate 2 - Identifying Murmur Classes I | 3 CE Credits

Listen for auditory differences between pathologic and innocent murmurs.

#### Intermediate 3 - Identifying Murmur Classes II | 3 CE Credits

Find the one sound of four that is either innocent or pathologic. The initial pathologic murmurs are easier to distinguish from innocent ones, and then gradually become more difficult.

#### Advanced 1 - Innocent or Pathological I | 2 CE Credits

Each question contains single murmur recordings in isolation, eliminating the ability to compare one sound to another.

#### Advanced 2 - Absent, Innocent or Pathological | 2 CE Credits

This module requires you to listen to a randomly selected heart sound recording in isolation and identify the presence and type of a murmur.

#### Advanced 3 - Innocent or Pathological II | 3 CE Credits

Identify each of four different sounds as being either innocent or pathologic.