Cardionics was founded by the late Dr. Abe Ravin, M.D., FACC in 1969. Dr. Ravin was a cardiologist and professor of clinical medicine at the University of Colorado in Denver. Dr. Ravin developed the first heart sound simulator to assist his students in learning to identify and differentiate normal and abnormal cardiac and pulmonary sounds. The American College of Cardiology acknowledged Dr. Ravin’s contribution with the distinguished Gifted Teacher Award.

Today and into the future, Cardionics' approach continues to set the pace for auscultation products and services through the development of unique, interactive, and experiential systems that integrate seamlessly into classroom, clinical, and telehealth applications.

To make the world a better place through life saving and medical education innovations.

To provide the medical industry with reliable, high-quality products which provide value to our customers and partners worldwide.

Cardionics was created from a desire to improve medical education, specifically the advancement of cardiac and pulmonary education. Invention and innovation are at the core of our products. Service is at the core of our team. Above all, our customer comes first.
TABLE OF CONTENTS

Cardionics Systems ........................................ 3
Comprehensive Solutions ................................. 4
Bionic Hybrid Simulator ................................. 5
SimScope ..................................................... 7
SimShirt ...................................................... 8
SAM 3G ......................................................... 9
SAM/PAT Comparison Chart ............................. 11
SAM Online .................................................. 12
PAT ............................................................ 13
SAM Basic/PAT Basic ....................................... 14
CardioSim VII ................................................ 15
CIE, HH, ISS ................................................ 16
3M Littmann .................................................. 17
SimulScope ................................................... 18
STS & PTS ..................................................... 19
Educational CD’s ........................................... 20
E-Scope and E-Scope HL ................................. 21
Telehealth Solutions ....................................... 22
Our Learning System is an innovative, holistic approach to auscultation and clinical education. With over a dozen products easily interconnected, the Learning System comprises comprehensive, instructive instruments in the classroom, simulation laboratory, and online. Our goal is to give students the opportunity to practice critical skills in a fun, engaging way by equipping them with the most advanced tools available.

Our Clinical System provides reliable equipment to medical professionals that is imperative to proper auscultation. Consisting of a line of electronic stethoscopes, the Clinical System enables physicians to amplify and analyze physiological sounds. For medical professionals or students with hearing loss, we offer top-grade solutions through our line of hearing-impaired model stethoscopes.

Our Telehealth Systems offer advanced auscultation solutions. Our solutions send and receive patient’s physiological sounds allowing for filtering, recording and distributing of live heart and lung sounds. In conjunction with telemedicine systems and carts our products provide the highest fidelity auscultation available.
As a leader in nursing education, it is paramount to have current technology that can assist students to become the best practitioners possible... SAM is very portable, easy to use and program and has very realistic sounds.

- Fran Kamp, MS, RN, CHSE
Clinical Associate Professor of Nursing
Georgia Baptist College of Nursing of Mercer University

Having an auscultation manikin with the capability and accessibility that SAM has, has proven to be the best solution to auscultation and assessment education for Indiana State University. With its customization, capability, and simplicity, students are able to learn and practice the assessment of physiological sounds more effectively than ever.

A true testament to this technology having actively engaged and immersed students into the learning process is that students would voluntarily use SAM for self-study.

- Robert Owegi, DNP, RN, CMSRN, CNE
Assistant Professor of Nursing
Indiana State University
Bionic Hybrid Simulator is designed to enhance students’ education of physical assessment skills. Worn by a Standardized Patient (SP) in a simulation laboratory, the Bionic Hybrid Simulator gives instructors real-time control over a vast range of normal and abnormal conditions — cardiac, respiratory, and bowel sounds, pulse points, blood pressures, cardiac rhythms, and more. This combination of customizable parameters with a live Standardized Patient makes the Bionic Hybrid Simulator the most realistic and instructive physical assessment simulation solution on the market.

**Wearable technology which can be used on live patients or manikins**

- Simulation of heart, breath, and bowel sounds
- Carotid and radial artery pulses
- 5-wire EKG Connection
- Simulates multiple physiological conditions
- Real time diagnostics and treatment capabilities
- Cardionics SimScope® Wifi and tablet Included with system
- Blood pressure cuff accessory*
  *Coming soon

Awards received for SimShirt® System technology which is used in Bionic Hybrid Simulator™, SimScope®, SAM Basic®, and PAT Basic® systems.
Developed in conjunction with The Multidisciplinary Simulation Center at Mayo Clinic’s campus in Rochester*.

When asked about the advantages of using the Bionic Hybrid Simulator with Standardized Patients, Thom Belda, Enterprise Simulation Technology Architect, from Mayo Clinic and primary contact in the joint development with Cardionics, stated:

“Human to human interaction increases aspects of realism, believability and engagement for participants training in medical simulation.”

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Bionic Hybrid Simulator</th>
<th>SimShirt</th>
<th>SimScope</th>
</tr>
</thead>
<tbody>
<tr>
<td>Award winning RFID technology</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simulates multiple physiological conditions</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can be worn by students and manikins</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>High-fidelity auscultation sounds</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simple one-on-one interaction</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quick setup</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Real time diagnostics and treatment capabilities</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Washable/Reusable</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RFID sensor tags integrated</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Audio prompts for SP</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse points</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-Wire EKG connections</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Mayo Clinic and Thomas Belda have a financial interest in the technology referenced in this catalog release. Mayo Clinic will use any revenue it receives to support its non-for-profit mission in patient care, education and research. ** Coming soon
The **SimScope** is the most instructive device available for auscultation and assessment in a patient simulation. With 30 physiological sounds, and packages offering up to 90 additional sounds to choose from, instructors will be able to customize patient parameters according to their curriculum, while retaining the real-life interaction between the student and Standardized Patient. The SimScope is designed to be incredibly easy to operate, while containing the largest library of physiological sounds in the industry — all to keep the simulation as educative and fluid as possible.

Awards received for SimShirt®, System technology which is used in Bionic Hybrid Simulator™, SimScope®, SAM Basic®, and PAT Basic® systems.
SimShirt System consists of SimShirt, SimScope®, and tablet with software

Simple one-on-one student to patient interaction

No standardized patient training required

Ideal for use with O.S.C.E. programs

Listen at anatomically correct auscultation sites

Reusable and washable

SimShirt is available in various sizes

The SimShirt System is designed to make physical assessment training easier and more informative than ever. The system contains RFID sensor tags woven into the fabric of the garment, providing a durable, customizable, and easy-to-use auscultation trainer in the classroom or simulation laboratory. The SimShirt can be worn by either a Standardized Patient (SP) during a simulation or by fellow students for more informal training in the classroom. With 30 physiological sounds available in the SimScope software, and packages of over 90 additional sounds available, the SimShirt System is the complete auscultation and assessment trainer for all academic levels.

Awards received for SimShirt® System technology which is used in Bionic Hybrid Simulator™, SimScope®, SAM Basic®, and PAT Basic® systems
The Student Auscultation Manikin — 3rd Generation — is an advancement on the leading auscultation manikin in the world. SAM 3G’s upgraded software has added dozens of case videos, a real sounds library, echocardiogram videos, and EKG waveforms to provide the complete auscultation training solution.

SAM 3G can be utilized in a variety of educative settings and levels. Its portability and ease of use make it optimal for simulation centers, classrooms, and auditoriums. With a host of lesson guides included, instructors can be confident that SAM 3G will equip their students with the skills necessary for accurate assessment and diagnosis.

If you already own a SAM II®, you can easily upgrade your existing software — either separately or as a bundle.
Case Videos
- SAM 3G contains 24 case videos with clinical interactions between medical student and patients.
- Users can watch a video and practice listening to the SAM for a life-like simulation.
- Users can also create and save their own case videos.

Real Sounds Library
- In addition to the largest simulated sounds library, SAM 3G now comes with a real sounds library.
- The real sounds library contains 24 sounds recorded from live patients.
- Real sounds provide a more realistic clinical setting scenario to train students in cardiac auscultation.

Echocardiogram Videos
- The new SAM 3G includes 12 echocardiogram videos recorded from real patients.
- Echocardiogram videos are associated with various cardiac pathologies.
- Each case has an apical and parasternal echocardiogram video.

Electrocardiogram Waveform
- Our latest addition of the electrocardiogram waveforms introduces students to the basics of EKG interpretation skills in limited teaching time.
- EKG waveform is displayed with various heart sounds to help identify S1.
- It also helps students with memorization and pattern.
# SAM/PAT Comparison Chart

<table>
<thead>
<tr>
<th>Benefits</th>
<th>SAM 3G™</th>
<th>SAM II™</th>
<th>SAM Basic™</th>
<th>PAT™</th>
<th>PAT Basic™</th>
<th>SAM online</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Fidelity Auscultation Sounds</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
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<tr>
<td>Heart Sounds</td>
<td>49</td>
<td>35</td>
<td>18</td>
<td>37</td>
<td>25</td>
<td>36</td>
</tr>
<tr>
<td>Lung Sounds</td>
<td>34</td>
<td>24</td>
<td>19</td>
<td>17</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>H&amp;L Combo Sounds</td>
<td>11</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td>Bowel Sounds</td>
<td>11</td>
<td>11</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Bruit Sounds</td>
<td>6</td>
<td>6</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Lightweight and Portable</td>
<td>16 lbs.</td>
<td>16 lbs.</td>
<td>13.5 lbs.</td>
<td>10.5 lbs.</td>
<td>8 lbs.</td>
<td></td>
</tr>
<tr>
<td>Use your own Stethoscope</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
<td></td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Laptop Pre-Installed with Software Included</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smart Classroom/Auditorium Ready</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>One-Year SAM Online Site License Included</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Software Includes Visual Phonocardiogram</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
<td></td>
<td></td>
<td>✔️</td>
</tr>
<tr>
<td>ECG Waveform</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
<td></td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Carotid Artery Palpation</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>24 Case Studies</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 Real Sounds Library</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 Echocardiogram Videos</td>
<td>✔️</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SimScope RFID Technology</td>
<td></td>
<td>✔️</td>
<td></td>
<td></td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>
New, improved, and easy to use software interface
Correct anatomical locations
Large library of sounds
Comprehensive lesson guides
Testing and tracking
Learning Arrhythmia Recognition

**SAM Online** provides access to a sound library of over 80 sounds including, heart, lung, bowel, and bruit sounds online for use anytime 24/7. Students, instructors, and practicing medical professionals alike are using SAM Online for at-home study, online instruction, and assessment of clinical auscultation skills.

**SAM Online** features excellent quality sounds along with lessons on each sound to help reinforce learning. SAM Online has proven to be a great value for student, instructors, nurses, and doctors. SAM Online now includes features that enable instructors to assign lectures, quizzes, and tests online.
PAT — the Pediatric Auscultation Trainer — provides engaging instruction for pediatric auscultation across all academic levels. Instructors will enjoy the extensive range of physiological sounds, while students will be able to use their own stethoscope — helping build confidence in their auscultation and assessment skills. PAT is designed with a host of pediatric-specific conditions, audible at their precise anatomical locations. Whether high school or graduate level, PAT is the complete pediatric auscultation trainer for students.

- Lightweight and portable
- Students use their own stethoscope
- Variable heart and respiration rate
- Phonocardiogram
- Smart classroom/auditorium ready
- Customized volume adjustments
- Online student learning
- Available in light and dark skin versions
- SAM Online site licence included
Utilizes the extensive Cardionics proprietary heart, lung, bowel, and bruit sounds library
Listen at anatomically correct auscultation sites
Easy to use
Portable and lightweight
Customizable to fit specific scenarios and programs
Light and dark skin models available
Wifi upgrade available allowing for remote selection of sound scenarios

The **SAM Basic** and **PAT Basic** offer affordable auscultation training solutions to users familiar with the SimScope®. Cooperative with the extensive sounds library of the SimScope software, these auscultative manikins combine simple operation with comprehensive parameters that can fit any level of curriculum.

Awards received for SimShirt®
System technology which is used in Bionic Hybrid Simulator™, SimScope®, SAM Basic®, and PAT Basic® systems
The **CardioSim VII** is the complete solution for presenting customizable physiological sounds and EKG waveforms in a classroom or auditorium. The CardioSim VII offers the ability to record and present patient sounds and EKGs, or simulate and customize those parameters from the extensive Cardionics sounds library for instructive purposes. Providing hundreds of physiological sounds, cardiac animations, ultrasound images, dissection slides, and the ability to edit every nuance of a heart sound, the CardioSim VII is the ultimate assistant for any lecture or presentation.
Broadcasts sounds to larger audiences
Excellent sound quality
Utilizes Heartman Infrared Headphones
Large number of applications
Easy to set up and use
Available for large and small auditoriums

The Classroom Infrared Emitter (CIE) and Auditorium Infrared Sound System (ISS) are designed to provide simultaneous listening for groups of any size. The CIE is intended for classrooms or simulation laboratories, while the ISS is optimal for larger classrooms and auditoriums with 30-90 members. Used in conjunction with the HeartMan Infrared Headphones, audience members will be able to listen to simulated or real patient sounds alongside the presenter for clearer interaction with the sounds.
We have teamed up with 3M™ Littmann to develop the 3M Littmann Listen-In Mobile Kit for effortless sharing of live patient physiological sounds. Users can pair up to five Littmann Model 3200 stethoscopes via a Bluetooth-enabled tablet and listen in on the auscultating stethoscope. This kit is optimal for both educative and clinical purposes — whether it’s students auscultating a SAM 3G manikin or an attending physician rounding with their residents.

The software and stethoscopes are incredibly user-friendly, allowing users to quickly switch between presenting stethoscopes for more intensive and accurate training. Through the 3M Littmann Listen-In Mobile Kit, instructors will gain confidence in their students’ accuracy and students will gain confidence in their own assessment skills.
The SimulScope allows clinicians and students the ability to hear live patient physiological sounds with up to 20 people simultaneously. The SimulScope is designed to provide targeted, bedside instruction for students, while minimizing intrusion on the patient. It is also beneficial in classrooms and simulation centers when auscultating simulators or manikins.
The **STS and PTS Systems** are designed for student self-instruction. The STS and PTS Systems were developed at the University of Texas Medical Branch (UTMB), Galveston, Texas by William Thornton, M.D., Professor of Medicine and former astronaut.

The **Self-Teaching System (STS)** is a guided program that introduces students to cardiac auscultation. The four-course system includes the STS software, pulse palpator, sounds reproducer, and 50-page illustrated workbook.

The **Pulse-Training System (PTS)** is a self-teaching program designed to introduce students to the theory and manual practice of arterial pulse palpation. Palpation is often the first assessment procedure a patient encounters, and proper method requires both knowledge and skill. The Pulse-Training System teaches both.

<table>
<thead>
<tr>
<th>STS - Introduction to cardiac auscultation</th>
</tr>
</thead>
<tbody>
<tr>
<td>STS - Normal variant heart sounds</td>
</tr>
<tr>
<td>STS - Abnormal heart sounds and murmurs</td>
</tr>
<tr>
<td>PTS - full range of arterial pulses – single and bimanual</td>
</tr>
<tr>
<td>PTS - Visualization of pulse waveform while palpating the pulse</td>
</tr>
<tr>
<td>PTS - Two palpators for bimanual palpation of the arterial pulse</td>
</tr>
</tbody>
</table>
Excellent teaching tool for any curriculum
Can be shared by entire class
Assists in student self-study
Focused topics for specialized learning

Learning Arrhythmia Recognition #717-9010
Learning Coronary Artery & Valvular Heart Disease #717-9146*
Learning Cardiac Auscultation #717-9147

Learning Electrocardiography #717-9136*
Learning Lung Sounds #717-9148

* These CD’s are not compatible with Windows 64-Bit Systems
The **E-­Scope (Electronic Stethoscope)** Clinical Model allows medical professionals to auscultate with increased volume by amplifying sounds up to 30 times louder than an acoustic scope. The E-­Scope is popular around the world in clinics, hospitals, research laboratories, and telemedicine settings. Additionally, the E-­Scope can be paired with an accessory cord to broadcast sounds through speakers or other audio outputs.

The **E-­Scope Hearing Impaired Model** includes an assortment of auditory accessories, allowing users with hearing loss the ability to choose the appropriate listening device for their specific needs. This model is identical in functionality to the Clinical Model — amplifying sounds up to 30 times louder than an acoustic scope. Separate headphones and accessories are offered to ensure we find the right solution for any user with hearing loss.

- Used with hearing aid or hearing impairment
- One-­handed control over volume adjustments
- Specialist adult diaphragm
- Automatic shut off after 1.5 to 2 minutes
- Audio output jack
- Battery operated (single AAA battery)
- Supplied with accessory pack
The **Cardionics Telehealth System** is a new approach to sending and receiving a patient’s physiological sounds over the internet. Using the Cardionics Telehealth System, a patient’s heart, lung, and bowel sounds are sent over telecommunication devices, usually from remote or rural locations, to a physician or hospital where the sounds can be better analyzed.
With 1200 students a year using them, the SAMs are my most useful tool. They're very dependable and functional. Seeing that "aha" moment when it all comes together for our students is very gratifying. It's proof that we're improving their educational experience.

- Dr. Bill Boudreaux  EdD RN CEN
  Assistant Professor/Medical Educator
  UTMB School of Medicine