CAPIS, Innovative in Healthcare

# POUYA-HEART

**Intelligent Digital Phonocardiogram**

**Automated CHD and CCHD Screening**

**Intenationally Patented Technology**

## Screening Congenital and Critical Congenital Heart Defects in Neonates and Children

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# POUYA-HEART

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## Innovative in Healthcare

The company is specialized in research and development in new technologies especially in different fields of digital signal processing with emphasis in children and adults healthcare. We have close contact with Europeans universities in particular with Mons University in Belgium. We offer different patented products including children's congenital

Among neonates and children, congenital heart malformations is responsible for more than 30% of mortality caused by the birth defects. Various studies show that more than 50% of newborns with heart malformations are not recognized at birth. The population of adult Congenital Heart Disease (ACHD) patients is growing at a rate of 5% per year. This is a "tsunami" in terms of adult with CHD, disease heterogeneity and complexity of work. Thus, an intervention is needed. Accurate screening of all newborns for congenital heart malformation CHD and Critical congenital heart disease (CCHD) is a crucial step in overcoming the problem of congenital heart malformation. The inclusion of echocardiography as the standard routine diagnostic procedure is impractical. Accurate screening of congenital heart malformations (CHD & CCHD) can be accomplished by an internationally patented passive intelligent machine known as Pouya Heart that analysis heart sounds (phonocardiography) for automatic diagnosis. We have found that prevalence of real heart malformations in well-baby nursery is 5%. We also have understood that prevalence of congenital heart malformations (including small PFO and closing PDA), in well-baby nurseries is up to 21%. However, it is widely believed that prevalence of heart malformation is one percent which is highly underestimated.

Pouya Heart is the result of more than 30 years of continues research and development. Pouya Heart is the only solution for automated accurate screening of congenital heart malformations in neonates, in infants and in children. The technology of the intelligent machine is patented internationally including in European Union, India, U.S.A. Iran, China, Russia etc.

The intelligent digital phonocardiography, Pouya Heart, is composed of integration of the spectral mathematical modelling of a child's heart sound generation in conjunction with advanced artificial intelligence into the suitable hardware. The technician records 10 seconds of heart sound from two different sites of either one of four thoracic sites of a newborn into the intelligent machine. The diagnosis result appears on the screen, as either normal or abnormal in real-time, along with a printout. Innocent murmurs are automatically and precisely classified as healthy sounds by the Pouya Heart. The intelligent machine has the option of choosing whether to screen all heart defects, including small PFO and closing PDA or not. The clinical validation of Pouya Heart has been approved in different universities and private maternity hospitals and on a population of more than 9000 neonates, infants and children, the clinical validation process has taken more than 3 years.

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The echocardiography is requested for newborns suspicious of congenital heart malformations, through the standard examination and through the Pouya-Heart examination. A neonates setected with CCHD through the standard medical examination, goes directly to the NICU.

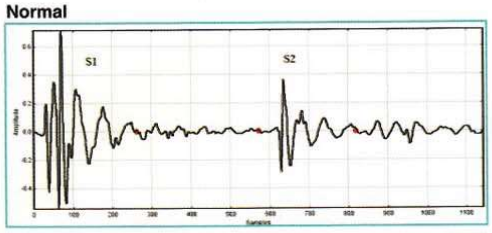
## Educatinal Tool:

Beside automated screening, as an intelligent digital cardiogram, Pouya-Heart also provides different options such as, listening and payback of recorded heart sounds with adjustable intensity levels, various selectable time scales for viewing the whole or part of a sound cycle, it shows the diagnosing results, segmentations and other characteristics of the signals. POUYA-HEART also provides the possibility of recording sound signals from different locations, ULSB, URSB, LLSB, and APEX.

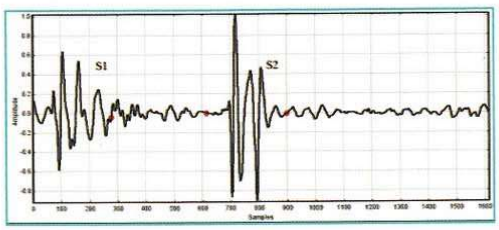
Discriminating between different heart sounds

Sample Signals Recorded and Segmented by POUYA-HEART

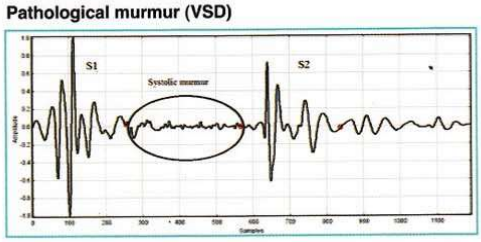
**Normal**




**Innocent murmur**




**Pathological murmur (VSD)**



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## Automated Digital Phonocardiogram

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