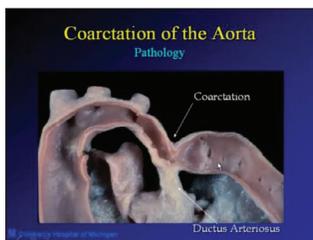
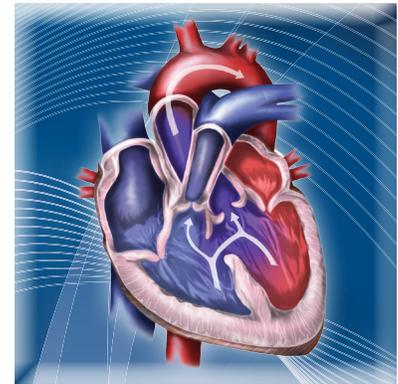


PEDIATRIC ECHOCARDIOGRAPHY

E-COURSE

SUMMARY

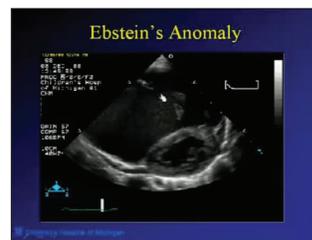
This eCourse, consisting of fourteen modules, is designed to provide a foundation for Pediatric Echocardiography. Beginning with the basic pediatric echo exam, Dr. Richard Humes of Children's Hospital of Detroit guides the participant through the anatomy, pathophysiology, and hemodynamics of cardiac disease in the pediatric population. CheckPoint questions are integrated throughout the presentation, providing immediate assessment of your mastery of the concepts presented.



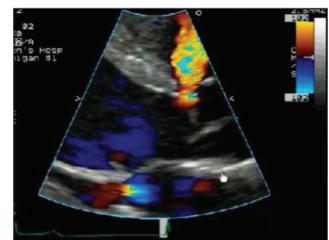
Coarctation of the Aorta



Tetralogy of Fallot



Ebstein's Anomaly



Ventricular Septal Defect

FACULTY



Richard A Humes, MD, FAAT, FAAC, FAHA, FASE

*Wayne State University, Children's Hospital of Michigan,
Detroit, Michigan*

Richard Humes, MD is the Chief of Cardiology and Professor of Pediatrics at Wayne State University and is on faculty at Children's Hospital of Michigan in Detroit. His clinical and research interests include echocardiography, fetal echocardiography, and telemedicine.

Dr. Humes holds board certifications from the American Board of Pediatrics and the American Board of Pediatrics, Cardiology Subspecialty. He has published extensively; most recently he has published articles on pediatric and adolescent cardiac issues in the

Journal of the American Society of Echocardiography, Pediatric Clinics of North America, American Society of Echocardiography Telemedicine Collaborators' Group, and Congenital Heart Disease.

MODULE DESCRIPTIONS

Module 1: Stats, the Cardiac Cycle, and the Basic Echo Exam

This introductory module covers the incidence of congenital heart disease, followed by a discussion of the basic phases of the normal cardiac cycle. Dr. Humes discusses the complete pediatric echo examination with emphasis on particular views which are unique to the pediatric examination. Dr. Humes demonstrates the various pediatric views through illustrations, ultrasound videos, and/or cadaver images, as indicated. The value of the M-Mode exam is discussed, including using M-Mode and color M-Mode as a timing tool. Dr. Humes emphasizes a systematic approach to the pediatric echo exam in order to minimize missing valuable information needed to provide an accurate diagnosis for your pediatric patient.

Core Concepts: 50 min

Focus Session: 38 min

Module 2: Assessment of Function

Within this module Dr. Humes discusses the techniques used to assess cardiac function, establish details of anatomy, and provide a complete hemodynamic evaluation. Beginning with the assessment of left ventricular function, myocardial contractility, and wall stress, Dr. Humes also covers right ventricular function, progressing to diastolic dysfunction, including spectral Doppler, tissue Doppler, and a discussion of contraction versus restriction. This module concludes with a section of intracardiac pressures and quantification of the cardiac hemodynamic profile.

Core Concepts: 45 min

Focus Session: 34 min

Module 3: Embryology and Fetal Circulation

This module covers cardiac development with special emphasis on those areas of cardiac embryology that lead to certain types of congenital defects. A solid understanding of cardiac development and embryology can greatly enhance the understanding of certain defects. Cardiac looping and realignment are discussed as they relate to cardiac abnormalities. Topics covered include atrial septal defects, septation of the AV canal, formation of AV valves, endocardial cushion defect, and Ebstein's anomaly. In addition, formation of semi-lunar valves, conotruncal malformations, ventricular septal defects, and arch anomalies are discussed. This module concludes with a review of normal fetal circulation and physiology so as to better understand how birth defects affect the fetal circulation in-utero as well as post birth.

Core Concepts: 45 min

Focus Session: 34 min

Module 4: Hemodynamics

In Module 4, Dr. Humes integrates a question and answer session into the discussion of basic cardiac hemodynamics and, after the concepts of normal hemodynamics are clearly presented, the discussion progresses to how blood flow and cardiac pressures are impacted by congenital heart disease. Dr. Humes simplifies the disruption of normal cardiac hemodynamics that congenital heart disease creates by discussing equilibration of pressures, saturations, effects of shunts, and changes in systemic venous and pulmonary venous flow. This module concludes with a clarification of confusing terminology.

Core Concepts: 32 min

Focus Session: 24 min

Module 5A: Congenital Shunts, Part I

We begin the discussion of congenital heart disease with simple shunts, the most common form of congenital heart disease. The most frequently encountered shunts are ventricular septal defects or atrial septal defects. Anatomic variations, case examples, and alterations in cardiac hemodynamics are covered. Questions are integrated throughout to engage the participant. The clinical and surgical decisions of repair are discussed.

Core Concepts: 1 hour 9 min

Focus Session: 52 min

Module 5B: Congenital Shunts, Part II

In this module, Dr. Humes discusses somewhat less common, but important, congenital shunt lesions. Congenital shunt lesions covered include patent ductus arteriosus, aorto-pulmonary window, atrioventricular canal defects, and total anomalous pulmonary venous return. Dr. Humes explains the pathophysiology, anatomy, clinical presentation, echo findings, and hemodynamic impact of the various congenital lesions.

Core Concepts: 1 hour 4 min

Focus Session: 48 min

Module 6: Obstructive Lesions

Module 6 begins with a discussion of left ventricular outflow obstruction, congenital aortic valve disease, supra- and subvalvular stenosis. Other topics include pulmonary valve stenosis, LV inflow obstruction, and parachute mitral valve. Dr. Humes stresses the importance of determining anatomy, measuring gradients, and assessing valvular dysfunction. Case presentations and interactive questions enhance comprehension of the material.

Core Concepts: 47 min

Focus Session: 36 min

Module 7: Aortic Arch and Great Vessels

In this module, Dr. Humes begins with a discussion of coarctation of the aorta, including Doppler gradients and tips on proper documentation, and then progresses to interrupted aortic arch, Types A and B, and aortic arch anomalies, including vascular rings. This module concludes with anatomy, clinical presentation, echocardiographic findings, and repair of pulmonary sling. Dr. Humes reinforces the importance of recognizing both the defect as well as the symptoms which initiate suspicion of a problem.

Core Concepts: 59 min

Focus Session: 45 min

Module 8: Conotruncal Abnormalities

The first topic covered in this module is Tetralogy of Fallot, including clinical presentation, anatomy, associated anomalies, complications, echocardiographic findings, and clinical and surgical decisions. Transposition of the great arteries is discussed with review of the anatomy of D-transposition and L-transposition of the great arteries and congenitally corrected transposition of the great arteries. This module concludes with a section on the clinical features, echocardiographic presentation, and clinical and surgical decisions of truncus arteriosus and double outlet right ventricle.

Core Concepts: 1 hour 20 min

Focus Session: 1 hour

Module 9: Single Ventricle

In Module 9, topics covered include the anatomy, clinical presentation, echocardiographic findings, and clinical/surgical decisions of tricuspid atresia, pulmonary atresia, hypoplastic left heart syndrome, and double-inlet left ventricle. Case presentations highlight the views that best demonstrate each type of pathology. Dr. Humes integrates interactive questions throughout the presentation to enhance comprehension of the material.

Core Concepts: 57 min

Focus Session: 43 min

Module 10: Ebstein's and Coronary Anomalies, LSCV

Module 10 begins with a series of interactive questions, designed to bring attention to key components of Ebstein's Anomaly, followed by discussions of the clinical presentation, associated anomalies, anatomy, echocardiographic documentation, and possible clinical and surgical decisions. Dr. Humes concludes this module by covering coronary artery anomalies, including anomalous left coronary artery, coronary artery fistula, and persistent left superior vena cava to the coronary sinus. Case examples provide clarification of echocardiographic findings.

Core Concepts: 27 min

Focus Session: 21 min

Module 11: Post-Operative Assessment

In this module Dr. Humes begins with a review of basic operative concepts, including closed versus open heart surgery and cardiopulmonary bypass. He covers various types and complications of common palliative surgeries as well as procedures for anatomic correction and non-anatomic correction. Some of the repairs covered are atrial septal defects, ventricular septal defects, patent ductus arteriosus, Tetralogy of Fallot, D-transposition of the great arteries, and aortic valve surgery. The section covering repair of the single ventricle includes discussions of the Fontan, Norwood, and Damus-Kaye-Stansel operations and modifications of these procedures. In conclusion, Dr. Humes discusses the future of congenital heart disease.

Core Concepts: 1 hour 17 min

Focus Session: 58 min

Module 12: Acquired Disease

In Module 12, Dr. Humes reminds us that pediatric echocardiography is more than congenital defects. Several pediatric diseases with cardiac consequences are discussed including Marfan's syndrome, hypertrophic obstructive cardiomyopathy, dilated cardiomyopathy, pericarditis, endocarditis, rheumatic fever, Kawasaki disease, and cardiac tumors seen in the pediatric population. For each pathology, Dr. Humes reviews the clinical presentation, echocardiographic presentation, and image identification. Interactive questions are integrated throughout the presentation.

Core Concepts: 59 min

Focus Session: 45 min

Module 13: Procedures

There are some procedures for which echocardiography can be a useful imaging tool. The application of echo to these procedures can vary greatly from one institution to another. Dr. Humes discusses transesophageal echo, echo-guided pericardiocentesis, some congenital cath lab interventions and the use of contrast in congenital heart disease.

Core Concepts: 20 min

Focus Session: 15 min

Pediatric Echocardiography eCourse Summary

Viewing Time

Core Concepts: *12.2 hours*

Focus Sessions: *9.2 hours*

CME

This activity is approved for *12.2 SDMS CME credits*.

For more information:

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