MYOCARDIAL DEFORMATION IMAGING: FROM TISSUE DOPPLER TO SPECKLE TRACKING

Theoretical and practical intensive course

Course Directors: Luigi P. Badano, Denisa Muraru

PURPOSES
To offer basic and advanced theoretical knowledge about myocardial deformation, assessed by new echocardiographic techniques (TDI and STE).
To offer practical training in TDI and STE, with application into the clinical practice, in order to help echocardiographers who wish to implement deformation imaging in the routine of their echo-lab.

DESIGN
A 3-day intensive theoretical and practical course with theoretical lessons in the morning and hands-on sessions in the afternoon has been organized.

COURSE LANGUAGE: English (no translation will be available)

VENUE: Department of cardiac, thoracic and vascular sciences, University of Padua, Medical School, Via Giustiniani 2, 35128 Padua, Italy

LEARNING OBJECTIVES:
Those who will attend will receive a comprehensive overview on state-of-the-art tissue Doppler and speckle tracking echocardiography.
Practical sessions will be focused on how to acquire images suitable for deformation analysis and how to perform quantitative analyses at workstations.

Important! The practical sessions will be performed using MyLab echo scanner and MyLab Desk (ESAOTE) workstation only.

TEACHING MATERIAL AND TOOLS:
A collection of review papers covering most of the topics will be sent electronically in advance to all the attendees.
Hands-on 3 hours daily (acquisition + post processing on MyLab Desk) with a dedicated tutor.
Those attending the practical sessions will be allowed to access our database of clinical cases to practice during free time.

SUGGESTED READINGS:
Badano LP, Galderisi M, Muraru D, Mondillo S. “Speckle tracking echocardiography”, MB&Care, Livorno; 2011 (Book in Italian)

Theoretical Sessions from 9:00 AM to 12:00 PM, from Monday to Wednesday
Day 1 - PRINCIPLES AND METHODOLOGY

9:00 – 9.30 Introduction. Why do we need myocardial velocity imaging and strain?

9:30- 10:00 Myocardial fiber architecture and the link with left ventricular mechanics

10:00-11:00 Myocardial function analysis by echocardiography (Part I)
  • Tissue Doppler Imaging (TDI):
    • Definition and general principles about velocity, displacement, strain and strain rate
    • On-line and off-line TDI
    • One-dimensional strain by tissue Doppler

11:00-12:00 Myocardial function analysis by echocardiography (Part II)
  • Speckle-tracking echocardiography (STE):
    • General principles of 2D speckle tracking echocardiography
    • Definition of strain and strain rate
    • Regional and global strain
    • Longitudinal, radial and circumferential strain
    • Twist and untwist, torsion, twist rate and untwist rate

Day 2 - CLINICAL APPLICATIONS (I)

9:00 - 9:30 Normal heart
  • Normal sequence of cardiac events
  • Normal strain and strain rate patterns
  • Reference values: left and right ventricle, left atrium

9:30 – 10:00 Thick heart
  • Athletes
  • Hypertensive heart disease
  • Hypertrophic cardiomyopathy
  • Infiltrative cardiomyopathies
  • Endocrine disorders

10:00 - 11:00 Hidden myocardial dysfunction
  • Heart valve diseases
  • Cardiotoxicity
  • Heart transplant

11:00 -12:00 Failing heart
  • Additive prognostic value
  • LV dyssynchrony

Day 3 - CLINICAL APPLICATIONS (II)

9:00 -10:00 Ischemic heart
  • Myocardial infarction
  • Chronic ischemic heart disease
  • Myocardial viability
  • Stress echocardiography

10:00-11:00 Right ventricular function
  • Why do we need it and how to do it?
  • Arrhythmic right ventricular cardiomyopathy
  • Pulmonary hypertension
  • Before and after cardiac surgery

11:00-11:30 Left atrial function
  • Why do we need it and how to do it?
  • Atrial fibrillation
  • LV diastolic dysfunction

11:30 – 12:00 Practical issues and future developments
  • Technical challenges
  • Intervendor reproducibility
  • Three-dimensional strain by speckle-tracking echocardiography

Two seats for theoretical and practical sessions will be reserved to EACVI Club 35 members with a 50% discount on the registration fee.

For further information, contact: barbara.hildenbrand@unipd.it