Heart Valve Specialist Core Syllabus

A learning framework for continuous medical education on valvular heart disease

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Foreword

Heart valve disease becomes a major cardiovascular pathologic entity, as a result of an increase in prevalence in the continuously aging population. A recent (2015) large scale community screening study (OxVALVE) found a prevalence of moderate and severe heart valve disease of 11.3% in individuals over the age of 65, with a predicted double prevalence by 2046. The consequent increase in demand for heart valve disease diagnostic and management services require advance planning of education and training of heart valve disease specialists. Advances in diagnostic and management techniques require the development of specific individual expertise and the development of expert multidisciplinary Heart Valve Teams.

The ESC Council on Valvular Heart Disease aims to encourage structured education on heart valve disease and to support the development of an accreditation process. Describing knowledge requirements and providing the framework for structured education, the Core Syllabus provides a platform for certification in heart valve disease of individuals and of Heart Valve Teams and for accreditation of Heart Valve Centres of Excellence. The ESC Council on Valvular Heart Disease plans to provide certification and accreditation opportunities as an incentive and motivation for self-improvement and also to document the recognition of quality in heart valve disease care.

The Core Syllabus provides a learning framework for individual learning and for the development of educational material and teaching events.

Introduction

The diagnosis, follow-up and management of heart valve disease require specific knowledge and skills from the multidisciplinary team involved. The Core Syllabus outlines the elements of knowledge needed as background for the development of skills.

Following the publication of the Heart Valve Specialist Core Syllabus, the ESC Council on Valvular Heart Disease will encourage and support the development of sessions dedicated to the Core Syllabus at the EuroValve Congress, at the European Society of Cardiology annual Congress, at PCR London Valves, at the European Association for Cardio-Thoracic Surgery Annual Meeting and at EuroEcho Imaging. Furthermore, The Accreditation Taskforce of the ESC Council on Valvular Heart Disease will develop and publish accreditation criteria and the description of the accreditation process.
Core Syllabus

1. **Epidemiology**  
   *ESC Topics 15.1, 15.2*  
   - Epidemiology  
   - Variations in aetiology globally  
   - Increase in degenerative and iatrogenic disease  
   - Effect of ageing population  
   - Device related endocarditis  
   - IVDU related endocarditis  
   - Global and local prevalence of valve disease  
   - Results of population surveys (e.g. Global Burden of Disease, OxVALVE, Nkomo et al. US-based, Norwegian Tromsø, Finnish)  
   - Findings of EuroHeart Surveys I and II

2. **Mechanisms of disease**  
   *ESC Topics 15.1, 15.2*  
   - Pathology of calcific aortic disease  
     - Similarities and differences compared with coronary disease  
   - Pathology of bicuspid aortic valve disease and associated disease of the aorta  
   - Pathology of annulo-aortic ectasia  
   - Pathology of aortic valve cusp prolapse  
   - Pathology of subaortic stenosis  
   - Pathology of degenerative mitral valve disease  
     - Barlow Disease  
     - Forme fruste  
     - Fibroelastic deficiency  
   - Pathology of calcific mitral stenosis  
   - Pathology of rheumatic disease  
     - Jones, WHO and other criteria for initial and subsequent attacks
- Treatment of acute rheumatic fever
- Secondary prophylaxis including duration
- Reasons for decline in rheumatic disease
- Pathology of carcinoid valve disease
- Drug-induced valve disease
- Radiation-induced valve disease
- Valve disease in systemic diseases
  - SLE and antiphospholipid syndrome
  - Ankylosing spondylitis

3. **Valvular heart failure**
   **ESC Topics 15.1, 15.2**
   - Heart failure in primary heart valve disease
   - Left ventricular remodelling
     - Heart failure with preserved ejection fraction (HFpEF)
     - Heart failure with reduced ejection fraction (HFrEF)
   - Secondary pulmonary hypertension and right heart failure
   - Secondary heart valve disease in heart failure
     - Ventricular-secondary regurgitation of atrio-ventricular valves
     - Atrial-secondary regurgitation of atrio-ventricular valves (including regurgitation due to atrial fibrillation)

4. **General care**
   **ESC Topics 15.3, 15.4, 15.5, 15.6**
   - Management of patients requiring non-cardiac surgery
   - Effect on driving and insurance
   - Advice to athletes
   - Pregnancy
   - Dental surveillance
   - Advantages and drawbacks of population screening
   - Costs
- Medicalisation of well people
- Evaluating surgical risk
- Drawbacks of EuroSCORE
- Frailty index and Futility for intervention
- Quality of life
- Effect of multiple morbidities on symptoms and principles of assessment
- Use of biomarkers notably BNP
- Patient and family education
- Variation in access to specialist care
  - The Heart Valve Clinic
  - The Heart Valve Centre of Excellence
  - The endocarditis team in the endocarditis reference centers
  - Interhospital variation in perioperative mortality
  - Interhospital variation in mitral valve repair rates
  - The effect of surgeon and hospital volumes
- Methods for organising care
  - Arguments for and against specialist valve clinics and specialised surgeons
  - Structure of Multidisciplinary teams
  - Culture of safety
  - Defining a valve specialist
  - Reduced access for the elderly
  - Effect of TAVI programmes on conventional surgical rates
  - Standards of a Heart Valve Centre
  - Virtual valve clinics
  - Models for community care
  - GP with special interest in valve disease
  - Murmur clinic
  - Open access echocardiography
  - Screening
- Different yields from clinical vs. echocardiographic screening
- Groups at particularly high risk
  - Elderly
  - Relatives of probands with bicuspid valve disease
  - Relatives of probands with Barlow mitral valve disease
  - Migrants from countries in which rheumatic fever is endemic
  - Atrial fibrillation
- Patient involvement
  - Effect of education on acceptance of results

5. **Aortic stenosis**

   *ESC Topics 15.1, 15.2, 15.3, 15.4, 15.5*

   - Epidemiology
   - Aetiology
   - Common and less common causes
   - The bicuspid aortic valve
     - Functional vs. anatomical bicuspid aortic valve
     - Patterns of cusps morphology
     - Association with aortic dilatation / aortic coarctation / mitral valve prolapse
     - Natural history
       - Risk of developing haemodynamically significant valve disease
       - Risk of developing aortic dilatation
       - Risk of dissection
   - Natural history of aortic stenosis
     - Response of the left ventricle to pressure load
     - Gender differences in response
     - Effect of coexistent coronary disease and hypertension
     - Conduction disease
     - Effect of LV hypertrophy on outcome
     - Prevalence of pulmonary hypertension and effect on outcome
- Valvular heart failure in aortic stenosis
- Symptoms and signs
  - Exercise testing to reveal latent symptoms
- Principles of assessment by echocardiography (ESC Topic 3.1)
  - Classification of severity and how to approach apparent discrepancies
  - Effect of incorrect readings
  - Use of dimensionless index and indexing to body surface area
  - The role of valve stress echocardiography
- Role of CMR (ESC Topic 3.3)
- Role of MDCT (ESC Topic 3.2)
- Role of Nuclear Imaging (ESC Topic 3.4)
- Low-flow low-gradient aortic stenosis with reduced and preserved EF
- The approach to the patient with moderate aortic stenosis and symptoms
- Frequency of surveillance
- Indications for and timing of surgery for severe aortic stenosis (ESC Topic 26.2)
- Criteria for surgery at the time of CABG or aortic surgery (ESC Topic 26.2)
- Indications for TAVI
- Evidence for balloon valvotomy and role as bridge to conventional surgery
- Postoperative complications including LV outflow acceleration (ESC Topic 26.2)
- Medical therapy
  - To reduce the rate of progression
    - In valvular heart failure
      - In end-stage inoperable aortic stenosis
      - In HFpEF despite successful valve replacement
    - Evidence for medical therapy in aortic dilatation

6. Aortic regurgitation
   ESC Topics 15.1, 15.2, 15.3, 15.4, 15.5
   - Epidemiology
   - Aetiology
- Primary and secondary causes
- Natural history
  - Response of the left ventricle to volume load
  - Effect of LV size on wall stress
  - Valvular heart failure and aortic regurgitation
- Symptoms and signs
  - Exercise testing to reveal latent symptoms
- Principles of assessment by echocardiography *(ESC Topic 3.1)*
  - Classification of severity
  - Importance of LV volumes
  - The role of valve stress echocardiography
- Role of CMR *(ESC Topic 3.3)*
- Frequency of surveillance
- Indications for and timing of surgery *(ESC Topic 26.2)*
- Types of surgery *(ESC Topic 26.2)*
  - Aortic valve replacement
  - Aortic valve repair
  - Valve-sparing aortic surgery
- Likelihood of permanent pacing
- Medical therapy
  - To reduce the rate of progression
  - Evidence for nifedipine, ACE inhibitors and AT receptor-blockers
  - Use and avoidance of beta-blockers

### 7. Mitral stenosis

ESC Topics 15.1, 15.2, 15.3, 15.4, 15.5

- Epidemiology
- Aetiology
  - Rheumatic
  - Calcific – Mitral Annulus Calcification
- SLE
- Natural history
  - Effect on pulmonary artery pressures and right ventricular function
  - Valvular heart failure in mitral stenosis
  - Complications including thromboembolism
- Symptoms and signs
- Exercise testing to reveal latent symptoms
- ECG and radiographic features
- Principles of assessment by echocardiography \((ESC\ Topic\ 3.1)\)
  - Classification of severity
  - The role of 3D echocardiography
  - The role of valve stress echocardiography
- Role of CMR \((ESC\ Topic\ 3.3)\)
- Role of MDCT \((ESC\ Topic\ 3.2)\)
- Frequency of surveillance
- Indications for and timing of intervention
- Balloon valvotomy
  - Favoured over surgery
  - Morphologic criteria of eligibility (echocardiographic assessment)
  - Natural history after balloon valvotomy
- Types of surgery \((ESC\ Topic\ 26.2)\)
  - Open valvotomy
  - Replacement
  - The role of repair
- Need to intervene for secondary tricuspid regurgitation
- Medical therapy
  - Rate control
  - Diuretics
  - Criteria for anticoagulation in sinus rhythm
8. Mitral regurgitation
   ESC Topics 15.1, 15.2, 15.3, 15.4, 15.5
   - Epidemiology
   - Aetiology
     - Primary and secondary
   - Natural history
     - Effect of LV volume load
     - Pulmonary artery pressures
     - Valvular heart failure and mitral regurgitation
   - Symptoms and signs
   - Exercise testing to reveal latent symptoms
   - Principles of assessment by echocardiography *(ESC Topic 3.1)*
     - Classification of severity
     - The role of 3D echocardiography
     - Morphologic characteristics of primary and secondary mitral regurgitation
     - Detailed morphologic and physiologic analysis to guide surgery
     - Differences in effect of grading in primary and secondary regurgitation
     - Role of valve stress echocardiography
   - Role of CMR *(ESC Topic 3.3)*
   - Role of MDCT *(ESC Topic 3.2)*
   - Role of fusion imaging and planning (percutaneous mitral valve prosthesis)
   - Frequency of surveillance
   - Indications for and timing of intervention in primary / secondary mitral regurgitation *(ESC Topic 26.6)*
     - Mitral valve repair
     - Types of repair
       - Triangular resection, quadrangular resection, sliding plasty
       - Respect vs. resect
       - Neochords
- Annuloplasty
- Under-sizing annuloplasty in secondary mitral regurgitation
- Differences in indication according to suitability for repair / need for CABG
- The definition of successful repair
- Iatrogenic / functional mitral stenosis
- Iatrogenic LVOTO
- Residual mitral regurgitation
- Natural history after repair

- Transcatheter procedures
  - Indications
  - Suitability based on valve morphology
- Need to intervene for secondary tricuspid regurgitation

- Medical therapy
  - Rate control
  - Evidence for ACE inhibitors and beta-blockers
  - Medical therapy in valvular heart failure

9. Right heart valve disease
   
   ESC Topics 15.1, 15.2, 15.3, 15.4, 15.5
   - Epidemiology of tricuspid and pulmonary valve disease
   - Aetiology
     - Association with congenital syndromes
     - Primary and secondary causes
   - Natural history
     - Effect of RV volume load
     - Pulmonary artery pressures
     - Valvular heart failure and right heart valve disease
   - Principles of assessment by echocardiography (ESC Topic 3.1)
     - Classification of severity
     - Assessment of morphology
- Role of CMR *(ESC Topic 3.3)*
  - Prominent role in pulmonary regurgitation
  - Assessment of right ventricular volumes and ejection fraction
- Role of MDCT *(ESC Topic 3.2)*
- Role of fusion CT / Echo findings for guiding better the percutaneous treatments
- Frequency of surveillance
- Indications for and timing of intervention *(ESC Topic 26.2)*
  - In tricuspid stenosis and pulmonary stenosis
  - In primary and secondary tricuspid regurgitation
    - Effect of delay in surgery
  - In pulmonary regurgitation
- Types of repair *(ESC Topic 26.2)*
- Prototype transcatheter devices
- Medical therapy
  - Rate control
  - Off-loading

**10. Infective endocarditis**  
*ESC Topics 16.1, 16.2, 16.3, 16.4, 16.5, 16.6*
- Prevalence estimates
- Changing epidemiology
  - Causative organisms for native, prosthetic and IVDU
  - Causes of culture negative IE
- Pathology of infective endocarditis (IE)
- Diagnosis of IE
  - Presentation of IE
  - When to suspect IE
  - Duke criteria for diagnosis
  - The differential diagnosis between IE and line infection
  - The difference between pacemaker pocket infection and device infection
- Complications of IE and of treatment
- The differential diagnosis between discitis and osteomyelitis
- Investigation of IE
  - Blood tests
    - Blood cultures, number and timing
  - Role of imaging
    - Central role of echocardiography
    - When TOE is indicated and when TTE is sufficient
    - Role of CT and PET
- Antibiotic management
  - Dose and duration
  - Methods of delivery including PICC or central line
  - Indications and evidence for outpatient management (OPAT)
- Determinants of mortality
- Indications for and timing of surgery
  - Effect of cerebral event and other complications
  - Effect of residual vegetation size
  - Special cases
    - Prosthetic valve IE
    - Right-sided IE
    - Management of implantable electrical device infection
- Service delivery
  Endocarditis teams
  Communication between hospitals and cardiothoracic center
  Patient education
- Outpatient follow-up
  - Recurrence and relapse rate
  - Requirement for surgery for residual regurgitation
  - Long-term survival
11. Replacement (‘prosthetic’) heart valves

ESC Topics 15.4, 26.2

- Types of replacement valve
  - Design
    - General design features (occluder, housing, sewing ring)
    - Common designs of mechanical valves
    - Common designs of stented xenograft
    - Types of stentless xenograft and potential advantages
  - Positioning (supra-annular, intra-annular, intermediate)
  - Homograft preparation and use
  - The Ross procedure and its indications

- Complications of replacement heart valves
  - Prevalence
  - Effect of valve design
  - Modes of primary failure of biological and mechanical valves
  - Valve dehiscence
  - Patient-prosthesis mismatch
    - Adverse effects
    - How it can be avoided

- Natural history of different valve types
  - Patient factors in determining failure: age, diabetes and hypertension

- Assessment of function
  - Detection of obstruction and regurgitation
  - Differentiation of thrombus and pannus
  - Identification of patient-prosthesis mismatch
- Management of anticoagulation
  - Pregnancy
  - Over-dose and active bleeding
  - Use of anticoagulants in biological valves
  - Role of vitamin K antagonists and of direct oral anticoagulants
- Management of valve thrombosis
- Management of valve dehiscence / paravalvular leak (regurgitation)
  - Conservative treatments and indications for intervention
  - Transcatheter paravalvular leak closure vs operative repair
- Principles of choosing type of valve
  - RCT of different designs of valve and microsimulation studies
  - Special cases, the woman of child-bearing age, the athlete, the fit elderly
- Risks of redo surgery
- Indications for valve-in valve transcatheter techniques
- Future directions for research and development
  - Design
  - Biopolymers and stem cell research
  - Transcatheter valves

Annex
ESC Topic List
ESC TOPIC LIST

A - BASICS
1 - History of Cardiology
2 - Clinical Skills
   2.1 - History Taking
   2.2 - Physical Examination
      2.2.1 - Auscultation
      2.2.99 - Physical Examination, Other
   2.3 - Electrocardiography
   2.99 - Clinical Skills - Other

B - IMAGING
3 - Imaging
   3.1 - Echocardiography
      3.1.1 - Echocardiography: Technology
      3.1.2 - Echocardiography: Dimensions, Volumes and Mass
      3.1.3 - Echocardiography: Systolic and Diastolic Function
      3.1.4 - Echocardiography: Valve Disease
      3.1.5 - Echocardiography: Masses and Sources of Emboli
      3.1.6 - Doppler Echocardiography
      3.1.7 - Transesophageal Echocardiography
      3.1.8 - Contrast Echocardiography
      3.1.9 - Tissue Doppler, Speckle Tracking and Strain Imaging
      3.1.10 - Stress Echocardiography
      3.1.11 - 3D Echocardiography
      3.1.12 - Intraoperative and Interventional Echocardiography
      3.1.99 - Echocardiography, Other
   3.2 - Computed Tomography
      3.2.1 - Computed Tomography: Technology
      3.2.2 - Computed Tomography: Dimensions, Volumes and Mass
      3.2.3 - Computed Tomography: Systolic and Diastolic Function
      3.2.4 - Computed Tomography: Valve Disease
      3.2.5 - Coronary Calcium Score
      3.2.6 - Coronary CT Angiography
      3.2.7 - Computed Tomography: Plaque Imaging
      3.2.8 - CT Myocardial Perfusion
3.2.9 - CT Imaging of Structural Heart Disease
3.2.10 - CT-derived FFR
3.2.11 - Computed Tomography: Extracardiac Findings
3.2.12 - Computed Tomography: Radiation Exposure
3.2.99 - Computed Tomography, Other

3.3 - Cardiac Magnetic Resonance
3.3.1 - Cardiac Magnetic Resonance: Physics and Technology
3.3.2 - Cardiac Magnetic Resonance: Dimensions, Volumes and Mass
3.3.3 - Cardiac Magnetic Resonance: Systolic and Diastolic Function
3.3.4 - Cardiac Magnetic Resonance: Valve Disease
3.3.5 - Cardiac Magnetic Resonance: Deformation Imaging
3.3.6 - Cardiac Magnetic Resonance: Flow Imaging
3.3.7 - Stress CMR
3.3.8 - Late Gadolinium Enhancement and Viability
3.3.9 - T1 and T2 Mapping, T2*
3.3.10 - Cardiac Magnetic Resonance: Coronary Imaging
3.3.11 - Cardiac Magnetic Resonance: Plaque Imaging
3.3.12 - Cardiac Magnetic Resonance: Angiography
3.3.13 - Cardiac Magnetic Resonance: Myocardium
3.3.14 - Cardiac Magnetic Resonance: Pericardium
3.3.15 - Cardiac Magnetic Resonance: Cardiac Masses
3.3.16 - Cardiac Magnetic Resonance: Safety
3.3.99 - Cardiac Magnetic Resonance, Other

3.4 - Nuclear Imaging
3.4.1 - Nuclear Imaging: Technology and Tracers
3.4.2 - Single Photon Emission Computed Tomography (SPECT)
   3.4.2.1 - Single Photon Emission Computed Tomography (SPECT) - Dimensions, Volumes and Mass
   3.4.2.2 - Single Photon Emission Computed Tomography (SPECT) - Systolic and Diastolic Function
   3.4.2.3 - Single Photon Emission Computed Tomography (SPECT) - Ischaemia and Viability
   3.4.2.99 - Single Photon Emission Computed Tomography (SPECT) - Other
3.4.3 - Positron Emission Tomography (PET)
   3.4.3.1 - Positron Emission Tomography (PET) - Dimensions, Volumes and Mass
   3.4.3.2 - Positron Emission Tomography (PET) - Systolic and Diastolic Function
   3.4.3.3 - Positron Emission Tomography (PET) - Ischaemia and Viability
   3.4.3.4 - Positron Emission Tomography (PET) - Inflammation
   3.4.3.99 - Positron Emission Tomography (PET) - Other
3.4.4 - Nuclear Imaging: Dimensions, Volumes and Mass
3.4.5 - Nuclear Imaging: Systolic and Diastolic Function
3.4.6 - Molecular Imaging
3.4.99 - Nuclear Cardiology, Other

3.5 - Hybrid and Fusion Imaging

3.6 - Cross-Modality and Multi-Modality Imaging Topics
3.6.1 - Imaging: Cardiac Dimensions, Volume, and Mass
3.6.2 - Imaging: Systolic and Diastolic Function
3.6.3 - Imaging: Valve Disease
3.6.4 - Imaging: Arrhythmias
3.6.5 - Imaging: Heart Failure
3.6.6 - Imaging: Coronary Artery Disease
3.6.7 - Imaging: Acute Coronary Syndromes
3.6.8 - Imaging: Myocardial Disease
3.6.9 - Imaging: Pericardial Disease
3.6.10 - Imaging: Congenital Heart Disease
C - ARRHYTHMIAS AND DEVICE THERAPY
4 - Arrhythmias, General
4.1 - Arrhythmias, General – Pathophysiology and Mechanisms
   4.1.1 - Cellular Mechanisms of Arrhythmias
   4.1.2 - Genetic Aspects of Arrhythmias
   4.1.3 - Arrhythmias, General – Pathophysiology and Mechanisms: Ion Channel Disorders
   4.1.99 - Arrhythmias: Pathophysiology and Mechanisms, Other
4.2 - Arrhythmias, General – Epidemiology, Prognosis, Outcome
4.3 - Arrhythmias, General – Diagnostic Methods
   4.3.1 - Arrhythmias, General – Diagnostic Methods: Electrocardiography
   4.3.2 - Arrhythmias, General – Diagnostic Methods: Signal-averaged ECG
   4.3.3 - Arrhythmias, General – Diagnostic Methods: Holter Monitoring and Event Recorder
   4.3.4 - Arrhythmias, General – Diagnostic Methods: Non-invasive Diagnostic Methods
   4.3.5 - Arrhythmias, General: Invasive Diagnostic Methods
   4.3.99 - Arrhythmias, General: Diagnostic Methods, Other
4.4 - Arrhythmias, General – Treatment
   4.4.1 - Arrhythmias, General: Lifestyle Modification
   4.4.2 - Antiarrhythmic Drug Treatment
   4.4.3 - Cardioversion and Defibrillation
   4.4.4 - Catheter Ablation of Arrhythmias
   4.4.99 - Arrhythmias, General: Treatment, Other
4.5 - Arrhythmias, General – Prevention
4.6 - Arrhythmias, General – Clinical
4.99 - Arrhythmias, General – Other

5 - Atrial Fibrillation
5.1 - Atrial Fibrillation - Pathophysiology and Mechanisms
   5.1.1 - Cellular Electrophysiology
   5.1.2 - Cell-cell Interactions
   5.1.3 - Disease Modeling in Atrial Fibrillation
   5.1.4 - Genetic Causes of Atrial Fibrillation
      5.1.4.1 - Monogenic diseases causing Atrial Fibrillation
      5.1.4.2 - Common Gene Variants in Atrial Fibrillation
   5.1.5 - Atrial Stressors Causing Atrial Fibrillation
      5.1.5.1 - Ischemia and Metabolic Imbalance
      5.1.5.2 - Heart Failure and Left Ventricular Dysfunction
      5.1.5.3 - Atrial Stressors Causing Atrial Fibrillation: Valvular Heart Disease
      5.1.5.4 - Sleep Disordered Breathing
E - CORONARY ARTERY DISEASE, ACUTE CORONARY SYNDROMES, ACUTE CARDIAC CARE

12 - Coronary Artery Disease (Chronic)
12.1 - Coronary Artery Disease – Pathophysiology and Mechanisms
   12.1.1 - Chronic Ischemia
   12.1.2 - Coronary Circulation, Flow, and Flow Reserve
   12.1.3 - Coronary Microcirculation and Collaterals
   12.1.4 - Coronary Artery Disease: Inflammation and Immunity
   12.1.5 - Hibernation
   12.1.99 - Coronary Artery Disease: Pathophysiology, Other

12.2 - Coronary Artery Disease – Epidemiology, Prognosis, Outcome

12.3 - Coronary Artery Disease – Diagnostic Methods
   12.3.1 - Coronary Artery Disease: Noninvasive Diagnostic Methods
   12.3.2 - Coronary Artery Disease: Angiography, Invasive Imaging, FFR
   12.3.3 - Coronary Artery Disease: Diagnostic Methods, Other

12.4 - Coronary Artery Disease – Treatment
   12.4.1 - Coronary Artery Disease: Lifestyle Modification
   12.4.2 - Coronary Artery Disease: Non-pharmacological Treatment
   12.4.3 - Coronary Artery Disease: Pharmacotherapy
   12.4.4 - Coronary Artery Disease: Treatment, Revascularization
      12.4.4.1 - Percutaneous Coronary Intervention
      12.4.4.2 - Coronary Artery Disease: Treatment, Revascularization: Bypass Surgery
      12.4.4.99 - Coronary Artery Disease: Treatment, Revascularization, Other
   12.4.99 - Coronary Artery Disease: Treatment, Other

12.5 - Coronary Artery Disease – Prevention

12.6 - Coronary Artery Disease - Clinical
   12.6.1 - Coronary Artery Disease and Comorbidities
   12.6.99 - Coronary Artery Disease: Clinical, Other

12.7 - Non-Atherosclerotic Coronary Abnormalities

12.99 - Coronary Artery Disease - Other

13 - Acute Coronary Syndromes
13.1 - Acute Coronary Syndromes – Pathophysiology and Mechanisms
   13.1.1 - Acute Myocardial Ischemia
   13.1.2 - Thrombosis, Platelets, and Coagulation
   13.1.3 - Acute Coronary Syndromes: Inflammation
   13.1.4 - Vulnerable Plaque
   13.1.5 - Vasospasm
   13.1.6 - Reperfusion and Reperfusion Injury
   13.1.7 - Left Ventricular Remodeling
   13.1.8 - No Reflow
   13.1.99 - Acute Coronary Syndromes; Pathophysiology, Other

13.2 - Acute Coronary Syndromes – Epidemiology, Prognosis, Outcome

13.3 - Acute Coronary Syndromes – Diagnostic Methods
   13.3.1 - Acute Coronary Syndromes: Biomarkers
   13.3.2 - Acute Coronary Syndromes: Non-invasive Imaging
   13.3.3 - Acute Coronary Syndromes: Angiography, Invasive Imaging, FFR
   13.3.99 - Acute Coronary Syndromes: Diagnostic Methods, Other

13.4 - Acute Coronary Syndromes – Treatment
   13.4.1 - Acute Coronary Syndromes: Lifestyle Modification
   13.4.2 - Acute Coronary Syndromes: Pharmacotherapy
      13.4.2.1 - Acute Coronary Syndromes: Antiplatelet Agents
15.6.5.2 - Secondary Mitral Valve Regurgitation
15.6.5.99 - Mitral Valve Regurgitation, Other
15.6.6 - Mitral Valve Prolapse
15.6.7 - Mitral Valve Disease, Other
15.6.8 - Tricuspid Valve Disease
15.6.9 - Pulmonary Valve Disease
15.6.10 - Rheumatic Heart Disease
15.6.11 - Prosthetic Heart Valves
15.6.99 - Valvular Heart Disease: Clinical, Other
15.99 - Valvular Heart Disease - Other
16 - Infective Endocarditis
16.1 - Infective Endocarditis – Pathophysiology and Mechanisms
16.2 - Infective Endocarditis – Epidemiology, Prognosis, Outcome
16.3 - Infective Endocarditis – Diagnostic Methods
  16.3.1 - Infective Endocarditis – Diagnostic Methods: Imaging
  16.3.2 - Infective Endocarditis – Diagnostic Methods: Microbiology
  16.3.99 - Infective Endocarditis: Diagnostic Methods, Other
16.4 - Infective Endocarditis – Treatment
  16.4.1 - Infective Endocarditis: Pharmacotherapy
  16.4.2 - Infective Endocarditis: Surgery
  16.4.99 - Infective Endocarditis: Treatment, Other
16.5 - Infective Endocarditis – Prevention
16.6 - Infective Endocarditis – Clinical
16.7 - Cardiac Implantable Device-related Endocarditis
16.99 - Infective Endocarditis - Other
17 - Myocardial Disease
17.1 - Myocardial Disease – Pathophysiology and Mechanisms
17.2 - Myocardial Disease – Epidemiology, Prognosis, Outcome
17.3 - Myocardial Disease – Diagnostic Methods
17.4 - Myocardial Disease – Treatment
  17.4.1 - Myocardial Disease: Pharmacotherapy
  17.4.2 - Myocardial Disease: Treatment, Other
17.5 - Myocardial Disease – Prevention
17.6 - Myocardial Disease – Clinical
  17.6.1 - Myocarditis
  17.6.2 - Hypertrophic Cardiomyopathy
  17.6.3 - Dilative Cardiomyopathy
  17.6.4 - Restrictive Cardiomyopathy and Loeffler’s Disease
17.6.5 - Myocardial Disease – Clinical: Arrhythmogenic Right Ventricular Cardiomyopathy
17.6.6 - Hypertensive Heart Disease
17.6.7 - Infiltrative Myocardial Disease
  17.6.7.1 - Amyloid Heart Disease
  17.6.7.2 - Cardiac Sarcoidosis
  17.6.7.3 - Fabry’s Disease
  17.6.7.4 - Mucopolysaccharidosis (MPS)
  17.6.7.99 - Infiltrative Myocardial Disease, Other
17.6.8 - Chagas Disease
17.6.9 - Tako-Tsubo Cardiomyopathy
17.6.10 - Peripartum Cardiomyopathy
17.6.11 - Ventricular Non-compaction
17.6.99 - Myocardial Disease: Clinical, Other
17.99 - Myocardial Disease - Other
18 - Pericardial Disease
18.1 - Pericardial Disease – Pathophysiology and Mechanisms
18.2 - Pericardial Disease – Epidemiology, Prognosis, Outcome
18.3 - Pericardial Disease – Diagnostic Methods
18.4 - Pericardial Disease – Treatment
  18.4.1 - Pericardial Disease: Pharmacotherapy
  18.4.2 - Pericardial Disease: Intervention and Surgery
  18.4.99 - Pericardial Disease: Treatment, Other
18.5 - Pericardial Disease – Prevention
18.6 - Pericardial Disease – Clinical
  18.6.1 - Pericarditis
  18.6.2 - Pericardial Effusion
  18.6.3 - Pericardial Constriction
  18.6.99 - Pericardial Disease: Clinical, Other
18.99 - Pericardial Disease - Other
19 - Tumors of the Heart
  19.1 - Tumors of the Heart – Pathophysiology and Mechanisms
  19.2 - Tumors of the Heart – Epidemiology, Prognosis, Outcome
  19.3 - Tumors of the Heart – Diagnostic Methods
  19.4 - Tumors of the Heart – Treatment
  19.5 - Tumors of the Heart – Prevention
  19.6 - Tumors of the Heart – Clinical
    19.6.1 - Myxoma
    19.6.99 - Tumors of the Heart: Clinical, Other
19.99 - Tumors of the Heart - Other
20 - Congenital Heart Disease and Pediatric Cardiology
  20.1 - Congenital Heart Disease – Pathophysiology and Mechanisms
  20.2 - Congenital Heart Disease – Epidemiology, Prognosis, Outcome
  20.3 - Congenital Heart Disease – Diagnostic Methods
    20.3.1 - Congenital Heart Disease: Echocardiography
    20.3.2 - Congenital Heart Disease: CMR
    20.3.99 - Congenital Heart Disease: Diagnostic Methods, Other
  20.4 - Congenital Heart Disease – Treatment
    20.4.1 - Congenital Heart Disease: Lifestyle Modification
    20.4.2 - Congenital Heart Disease: Pharmacotherapy
    20.4.3 - Congenital Heart Disease: Intervention
    20.4.4 - Congenital Heart Disease: Surgery
    20.4.99 - Congenital Heart Disease: Treatment, Other
  20.5 - Congenital Heart Disease – Prevention
  20.6 - Congenital Heart Disease – Clinical
    20.6.1 - Fetal Heart Disease
    20.6.2 - Adult Congenital Heart Disease, Clinical
    20.6.99 - Congenital Heart Disease: Clinical, Other
20.7 - Pediatric Cardiology
  20.99 - Congenital Heart Disease and Pediatric Cardiology - Other
21 - Pulmonary Circulation, Pulmonary Embolism, Right Heart Failure
  21.1 - Pulmonary Circulation, Pulmonary Embolism, Right Heart Failure – Pathophysiology and Mechanisms
  21.2 - Pulmonary Circulation, Pulmonary Embolism, Right Heart Failure – Epidemiology, Prognosis, Outcome
  21.3 - Pulmonary Circulation, Pulmonary Embolism, Right Heart Failure – Diagnostic Methods
  21.4 - Pulmonary Circulation, Pulmonary Embolism, Right Heart Failure - Treatment
    21.4.1 - Pulmonary Circulation, Pulmonary Embolism, Right Heart Failure: Pharmacotherapy
    21.4.2 - Pulmonary Circulation, Pulmonary Embolism, Right Heart Failure: Intervention
    21.4.3 - Pulmonary Circulation, Pulmonary Embolism, Right Heart Failure: Surgery
    21.4.99 - Pulmonary Circulation, Pulmonary Embolism, Right Heart Failure: Treatment, Other
21.5 - Pulmonary Circulation, Pulmonary Embolism, Right Heart Failure - Prevention
21.6 - Pulmonary Circulation, Pulmonary Embolism, Right Heart Failure – Clinical
  21.6.1 - Pulmonary Embolism
  21.6.2 - Venous Thromboembolism
  21.6.3 - Pulmonary Hypertension
  21.6.99 - Pulmonary Circulation, Clinical, Other
21.99 - Pulmonary Circulation, Pulmonary Embolism, Right Heart Failure - Other

G - AORTIC DISEASE, PERIPHERAL VASCULAR DISEASE, STROKE
22 - Aortic Disease
22.1 - Aortic Disease – Pathophysiology and Mechanisms
22.2 - Aortic Disease – Epidemiology, Prognosis, Outcome
22.3 - Aortic Disease – Diagnostic Methods
  22.3.1 - Aortic Disease: Echocardiography
  22.3.2 - Aortic Disease: Computed Tomography
  22.3.3 - Aortic Disease: CMR
  22.3.99 - Aortic Disease: Diagnostic Methods, Other
22.4 - Aortic Disease - Treatment
  22.4.1 - Aortic Disease: Lifestyle Modification
  22.4.2 - Aortic Disease: Pharmacotherapy
  22.4.3 - Aortic Disease: Intervention
  22.4.4 - Aortic Disease: Surgery
  22.4.99 - Aortic Disease: Treatment, Other
22.5 - Aortic Disease – Prevention
22.6 - Aortic Disease – Clinical
  22.6.1 - Acute Aortic Syndromes, Aortic Dissection
  22.6.2 - Aortic Aneurysm, Thoracic
  22.6.3 - Aortic Aneurysm, Abdominal
  22.6.4 - Inflammatory Aortic Disease
  22.6.5 - Traumatic Injury of the Aorta
  22.6.99 - Aortic Disease: Clinical, Other
22.99 - Aortic Disease - Other
23 - Peripheral Vascular and Cerebrovascular Disease
23.1 - Peripheral Vascular and Cerebrovascular Disease – Pathophysiology and Mechanisms
23.2 - Peripheral Vascular and Cerebrovascular Disease – Epidemiology, Prognosis, Outcome
23.3 - Peripheral Vascular and Cerebrovascular Disease – Diagnostic Methods
23.4 - Peripheral Vascular and Cerebrovascular Disease - Treatment
  23.4.1 - Peripheral Vascular and Cerebrovascular Disease: Lifestyle Modification
  23.4.2 - Peripheral Vascular and Cerebrovascular Disease: Pharmacotherapy
  23.4.3 - Peripheral Vascular and Cerebrovascular Disease: Intervention
  23.4.4 - Peripheral Vascular and Cerebrovascular Disease: Surgery
  23.4.99 - Peripheral Vascular and Cerebrovascular Disease: Treatment, Other
23.5 - Peripheral Vascular and Cerebrovascular Disease – Prevention
23.6 - Peripheral Vascular and Cerebrovascular Disease – Clinical
  23.6.1 - Peripheral Artery Disease
  23.6.2 - Carotid Disease
  23.6.3 - Venous Disease
  23.6.99 - Peripheral Vascular and Cerebrovascular Disease: Clinical, Other
23.99 - Peripheral Vascular and Cerebrovascular Disease - Other
24 - Stroke
24.1 - Stroke – Pathophysiology and Mechanisms
24.2 - Stroke – Epidemiology, Prognosis, Outcome
24.3 - Stroke - Diagnostic Methods
24.4 - Stroke - Treatment
    24.4.1 - Stroke: Lifestyle Modification
    24.4.2 - Stroke: Pharmacotherapy
    24.4.3 - Stroke: Acute Intervention
    24.4.4 - Stroke: Surgery
    24.4.99 - Stroke: Treatment, Other
24.5 - Stroke - Prevention
24.6 - Stroke – Clinical
    24.6.1 - Stroke: Carotid Stenosis
    24.6.2 - Stroke: Persistent Foramen Ovale and PFO closure
    24.6.3 - Stroke: Cardiogenic Embolism
        24.6.3.1 - Stroke: Atrial Fibrillation
        24.6.3.2 - Stroke: LAA and LAA closure
        24.6.3.99 - Stroke: Cardiogenic Embolism, Other
    24.6.99 - Stroke: Clinical, Other
24.7 - Heart and Brain Interaction
24.99 - Stroke - Other
H - INTERVENTIONAL CARDIOLOGY AND CARDIOVASCULAR SURGERY
25 - Interventional Cardiology
25.1 - Invasive Imaging and Functional Assessment
    25.1.1 - Invasive Hemodynamic Assessment/Right Heart Catheterization
    25.1.2 - Coronary Angiography
    25.1.3 - Peripheral Angiography
    25.1.4 - Intracoronary Ultrasound
    25.1.5 - Optical Coherence Tomography
    25.1.6 - Fractional Flow Reserve
    25.1.7 - Coronary Flow Reserve
    25.1.99 - Invasive Imaging, Other
25.2 - Coronary Intervention
    25.2.1 - Coronary Intervention: Vascular Access
    25.2.2 - Coronary Intervention: Devices
    25.2.3 - Coronary Intervention: Stents
    25.2.4 - Coronary Intervention: Technique
    25.2.5 - Coronary Intervention: Complications
    25.2.6 - Coronary Intervention: Primary and Acute PCI
    25.2.7 - Coronary Intervention: CTO
    25.2.8 - Coronary Intervention: Adjunctive Pharmacotherapy
    25.2.9 - Coronary Intervention: Mechanical Circulatory Support
    25.2.10 - Coronary Intervention: Restenosis
    25.2.11 - Coronary Intervention: Stent Thrombosis
    25.2.12 - Coronary Intervention: Outcome
    25.2.99 - Coronary Intervention, Other
25.3 - Non-coronary Cardiac Intervention
    25.3.1 - Aortic Valve Intervention
    25.3.2 - Mitral Valve Intervention
    25.3.3 - Tricuspid Valve Intervention
    25.3.4 - Pulmonary Valve Intervention
    25.3.5 - PFO/ASD Closure
    25.3.6 - LAA Closure
    25.3.99 - Non-Coronary Cardiac Intervention, Other
25.99 - Interventional Cardiology - Other
26 - Cardiovascular Surgery
26.1 - Cardiovascular Surgery – Coronary Arteries
26.2 - Cardiovascular Surgery – Valves
26.3 - Cardiovascular Surgery – Congenital Heart Disease
26.4 - Cardiovascular Surgery – Aorta
26.5 - Cardiovascular Surgery – Carotid and Peripheral Arteries
26.6 - Cardiovascular Surgery – Ventricular Assist Devices and Artificial Heart
26.7 - Cardiovascular Surgery – Circulatory Support
26.8 - Cardiovascular Surgery - Transplantation
26.9 - Cardiovascular Surgery – Arrhythmias
26.10 - Cardiovascular Surgery – Minimally Invasive Surgery
26.99 - Cardiovascular Surgery - Other

I - HYPERTENSION
27 - Hypertension
27.1 - Hypertension – Pathophysiology and Mechanisms
   27.1.1 - Target Organ Damage/ Left Ventricular Hypertrophy
   27.1.2 - Renin-Angiotensin System
   27.1.3 - Endocrine Hypertension
   27.1.4 - Renal Artery Stenosis / Autonomic Nervous System
   27.1.99 - Secondary Hypertension, Other
27.2 - Hypertension – Epidemiology, Prognosis, Outcome
27.3 - Hypertension – Diagnostic Methods
   27.3.1 - Blood Pressure Measurement
   27.3.2 - Hypertension: Diagnostic Methods, Other
27.4 - Hypertension – Treatment
   27.4.1 - Hypertension: Lifestyle Modification
   27.4.2 - Hypertension: Pharmacotherapy
   27.4.3 - Hypertension: Device Treatment and Intervention
      27.4.3.1 - Renal Denervation
      27.4.3.2 - Hypertension: Device Treatment and Intervention, Other
   27.4.4 - Hypertension: Treatment, Other
27.5 - Hypertension – Prevention
27.6 - Hypertension – Clinical
27.99 - Hypertension - Other

"J - PREVENTIVE CARDIOLOGY"

28 - Risk Factors and Prevention
28.1 - Risk Factors and Prevention – Epidemiology
28.2 - Risk Factors and Prevention – Cardiovascular Risk Assessment
   28.2.1 - Prevention – Cardiovascular Risk Assessment: Scores
   28.2.2 - Prevention – Cardiovascular Risk Assessment: Biomarkers
   28.2.3 - Prevention – Cardiovascular Risk Assessment: Imaging
   28.2.99 - Prevention – Cardiovascular Risk Assessment, Other
28.3 - Secondary Prevention
28.4 - Lipids
   28.4.1 - Lipids: Drug therapy
   28.4.99 - Lipids, Other
28.5 - Tobacco
28.6 - Obesity
28.7 - Diabetes and the Heart
   28.7.1 - Diabetes and the Heart: Pathophysiology
   28.7.2 - Metabolic Syndrome, Insulin, Insulin Resistance
   28.7.3 - Diabetes and the Heart: Pharmacotherapy
   28.7.4 - Diabetes and the Heart: PCI and Surgery
   28.7.99 - Diabetes and the Heart, Other
31.1.3 - Angiotensin-Renin-Bradykinine System
31.1.4 - Anticoagulants
31.1.5 - Antiplatelet Drugs
31.1.6 - Beta Blockers
31.1.7 - Calcium Channel Blockers
31.1.8 - Diuretics
31.1.9 - Nitrates
31.1.10 - Lipid-Lowering Agents
  31.1.10.1 - Statins
  31.1.10.2 - Cholesterol Resorption Antagonists
  31.1.10.3 - LDL-Receptor Antagonists
  31.1.10.4 - PCSK9-Antagonists
  31.1.10.99 - Lipid-Lowering Agents, Other
31.1.11 - Anti-Diabetic Pharmacotherapy
31.1.99 - Cardiovascular Drug Therapy, Other

31.2 - Pharmacogenetics
31.3 - Biotherapies
31.4 - Cardiotoxicity of Drugs
31.99 - Pharmacology and Pharmacotherapy - Other

M - CARDIOVASCULAR NURSING
32 - Cardiovascular Nursing
32.1 - Acute Nursing Care
32.2 - Chronic Nursing Care
32.99 - Cardiovascular Nursing - Other

N - E-CARDIOLOGY / DIGITAL HEALTH, PUBLIC HEALTH, HEALTH ECONOMICS, RESEARCH METHODOLOGY
33 - e-Cardiology / Digital Health
33.1 - Image Processing and Imaging Standards
33.2 - Cardiovascular Signal Processing
  33.2.1 - ECG and Arrhythmia Analysis
  33.2.99 - Cardiovascular Signal Processing, Other
33.3 - Computer Modeling and Simulation
33.4 - Digital Health
  33.4.1 - Remote Patient Monitoring and Telemedicine
  33.4.2 - Hospital Information Systems
  33.4.3 - Digital Health: Big Data Analysis
  33.4.4 - e-Health
  33.4.5 - m-Health
  33.4.99 - Digital Health, Other
33.99 - e-Cardiology - Other

34 - Public Health and Health Economics
34.1 - Public Health
34.2 - Health Policy
34.3 - Health Economics
34.99 - Public Health and Health Economics - Other

35 - Research Methodology
35.1 - Biostatistics
35.2 - Research Methodology: Big Data Analysis
35.3 - Cardiovascular Epidemiology
35.4 - Trial Design
35.5 - Research Ethics
35.99 - Research Methodology - Other

O - BASIC SCIENCE
36 - Basic Science
36.1 - Basic Science - Cardiovascular Development and Anatomy

36.1.1 - Basic Science - Cardiovascular Development and Anatomy: Stem Cells, Cell Cycle, Cell Senescence, Cell Death

36.1.2 - Basic Science - Cardiovascular Development and Anatomy: Genetics, Epigenetics, ncRNA

36.1.99 - Cardiovascular Development and Anatomy, Other

36.2 - Basic Science - Cardiac Biology and Physiology

36.2.1 - Stem Cells, Cell Cycle, Cell Senescence, Cell Death

36.2.2 - Basic Science - Cardiac Biology and Physiology: Genetics, Epigenetics, ncRNA

36.2.3 - Basic Science - Cardiac Biology and Physiology: Signal Transduction, Mechano-Transduction

36.2.4 - Basic Science - Cardiac Biology and Physiology: Ion Channels, Electrophysiology

36.2.5 - Basic Science - Cardiac Biology and Physiology: Mitochondria

36.2.6 - Basic Science - Cardiac Biology and Physiology: Microvesicles, Exosomes

36.2.7 - Basic Science - Cardiac Biology and Physiology: Metabolism

36.2.8 - Basic Science - Cardiac Biology and Physiology: Leukocytes, Inflammation, Immunity

36.2.9 - Basic Science - Cardiac Biology and Physiology: Biomaterials, Tissue Engineering

36.2.99 - Cardiac Biology and Physiology, Other

36.3 - Basic Science - Cardiac Diseases

36.3.1 - Ischemia, Infarction, Cardioprotection

36.3.2 - Basic Science - Cardiac Diseases: Cardiac Hypertrophy

36.3.3 - Basic Science - Cardiac Diseases: Heart Failure

36.3.4 - Basic Science - Cardiac Diseases: Arrhythmias

36.3.5 - Basic Science - Cardiac Diseases: Cardiomyopathies

36.3.6 - Basic Science - Cardiac Diseases: Valvular Heart Disease

36.3.7 - Basic Science - Cardiac Diseases: Congenital Heart Disease

36.3.8 - Basic Science - Cardiac Diseases: Leukocytes, Inflammation, Immunity

36.3.9 - Basic Science - Cardiac Diseases: Fibrosis

36.3.10 - Basic Science - Cardiac Diseases: Drugs, Drug Targets

36.3.11 - Basic Science - Cardiac Diseases: Gene Therapy, Cell Therapy

36.3.12 - Basic Science - Cardiac Diseases: Biomarkers

36.3.99 - Cardiac Diseases, Other

36.4 - Basic Science - Vascular Biology and Physiology

36.4.1 - Stem Cells, Cell Cycle, Cell Senescence, Cell Death

36.4.2 - Basic Science - Vascular Biology and Physiology: Genetics, Epigenetics, ncRNA

36.4.3 - Basic Science - Vascular Biology and Physiology: Signal Transduction, Mechano-Transduction

36.4.4 - Vascular Tone, Permeability, Microcirculation

36.4.5 - Vascular Biology and Physiology: Ion Channels, Electrophysiology

36.4.6 - Basic Science - Vascular Biology and Physiology: Mitochondria

36.4.7 - Basic Science - Vascular Biology and Physiology: Microvesicles, Exosomes

36.4.8 - Lipids, Metabolism

36.4.9 - Platelets, Haemostasis, Coagulation

36.4.10 - Basic Science - Vascular Biology and Physiology: Leukocytes, Inflammation, Immunity

36.4.11 - Basic Science - Vascular Biology and Physiology: Biomaterials, Tissue Engineering
36.4.99 - Vascular Biology and Physiology, Other

36.5 - Basic Science - Vascular Diseases
   36.5.1 - Microcirculation, Angiogenesis, Arteriogenesis
   36.5.2 - Atherosclerosis, Cerebrovascular Diseases, Aneurysm, Restenosis
   36.5.3 - Hypertension, Pulmonary Hypertension
   36.5.4 - Thrombosis, Bleeding
   36.5.5 - Lipid Metabolism, Metabolic Syndrome, Diabetes
   36.5.6 - Basic Science - Vascular Diseases: Leukocytes, Inflammation, Immunity

   36.5.7 - Basic Science - Vascular Diseases: Fibrosis
   36.5.8 - Basic Science - Vascular Diseases: Drugs, Drug Targets
   36.5.9 - Basic Science - Vascular Diseases: Gene Therapy, Cell Therapy
   36.5.10 - Basic Science - Vascular Diseases: Biomarkers
   36.5.99 - Vascular Diseases, Other

36.99 - Basic Science - Other

P - OTHER
80 - Training and Education
90 - European Society of Cardiology
   90.1 - Acute Cardiovascular Care Association
   90.2 - Heart Failure Association
   90.3 - European Heart Rhythm Association
   90.4 - European Association of Percutaneous Cardiovascular Intervention
   90.5 - European Association of Preventive Cardiology
   90.6 - European Association of Cardiovascular Imaging
   90.7 - Councils
   90.8 - Working Groups
   90.9 - ESC Board
   90.10 - ESC Committees
   90.11 - European Heart House
   90.12 - European Heart Agency
   90.13 - EURObservational Research Programme
   90.14 - Education and Certification
   90.99 - European Society of Cardiology - Other
99 - Other