

# **International Congress of Cardiology**

## **From Scientific Research to Clinical Practice**

### **Palermo (Italy), January 19-21, 2017**

#### **Highlights**

## **Introduction**



Prof. Novo chairman of the symposium, opened the congress, by highlighting the high scientific level of this meeting. The symposium was attended by many top researchers in Cardiology coming from all the world. This symposium was a very important occasion for an update in cardiology science, from epidemiology to genetics, imaging and therapy, in full compliance with the tradition of the Palermo University school of Cardiology.

To follow the presentations of this congress, click on the link below:

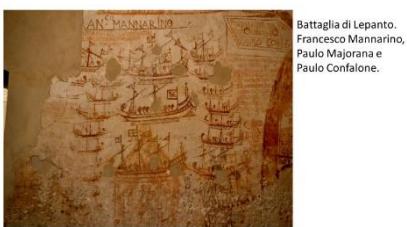
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## The history of Chiaramonte “Steri” Building



The history of Chiaramonte “Steri” Building was the topic discussed by Prof. Fiume in her lecture. The speaker, coming from Palermo (IT), went deeper in her talk by presenting very interesting pictures given by wall graffiti drawn during the centuries by the captives living in the Domus of Ludovico Paramo, the “Holy Office”

jails built in Palermo. Through these pictures showing a huge variety of images, the guests, poor people coming from different countries, transmitted a lot of messages about the life in this prison. The speaker, starting from these “graffiti” and drawings, spoke about some topics like authority, obedience and their limits. These graffiti have been considered as a space stolen from the religious authorities, as special witnesses of the justice and the legitimacy of the court of those times. These “graffiti” are not simple drawings, they look like facts and actions, they are the track of an experience. The authors have a corporal relationship with them, produced with their own saliva, urine and sperm, Prof. Fiume pointed out. In conclusion, the speaker highlighted that these graffiti are a unique proof of the voice of these victims.

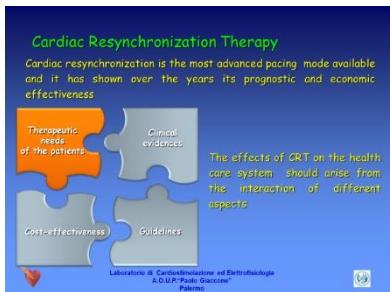


- What's about the history of Chiaramonte Palace presented by the speaker?
- What are the main pictures discussed by the author?
- What's about the written drawn on the walls by the captives?
- What's about the meaning of these graffiti from the speaker point of view?
- What's about the history of the Lepanto battle painted on the wall of one of these jails?
- What's about the religiosity displayed through these graffiti?
- Who are the captives living in these jails?

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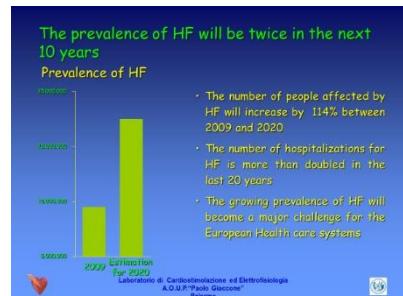
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# Effects on health care resource utilization and costs of Cardiac Resynchronization Therapy

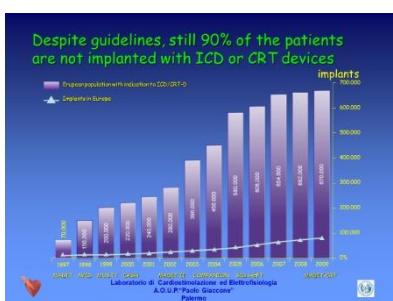


Prof. Ciaramitato from Palermo (IT), spoke about the effects of the Cardiac Resynchronization Therapy on health care resource utilization and costs, by presenting very interesting data on the therapeutic needs of the patients, the clinical evidences about this procedure, the cost-effectiveness and finally on the indications of the specific guidelines. The speaker went deeper in his lecture by

highlighting that HF is an increasing disease in Europe and CRT can be a very effective procedure in these patients. From the clinical point of view, Prof. Ciaramitato presented very interesting data on the effects of CRT in HF patients, by highlighting the significant reduction in mortality and



hospitalization for HF progression. The guidelines recommend the implantation procedure through CRT devices, but despite these recommendations still the 90% of patients are not implanted, the speaker pointed out. In conclusion, Prof. Ciaramitato highlighted that also from a cost-effective point of view, CRT is very effective as NNT demonstrates, more in particular in those patients not burdened with excessive comorbidities.



- What's about the impact on complications of the longevity of CRT devices?
- What's about the cost-effectiveness of CRT by considering the cost per life year saved?
- What's about the NNT for CRT compared to many pharmacological therapies?
- What is the impact of comorbidities on the CRT implantation procedures?
- What are the main clinical evidences on CRT presented by the speaker?

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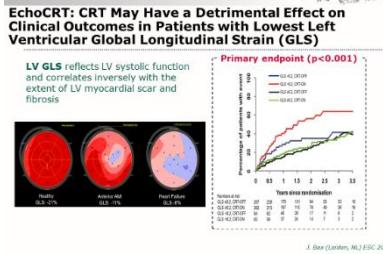
# Clinical use of multimodality imaging in the assessment of dilated cardiomyopathy

Cardiovascular Imaging 2017

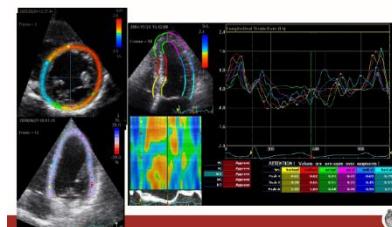
- Different imaging modalities
  - Echocardiography
  - Nuclear Cardiology
  - CT
  - CMR
  - PET
  - Fusion Imaging

The clinical use of multimodality imaging in the assessment of dilated cardiomyopathy, was the topic Prof. Pinto spoke about in his lecture. The speaker coming from Lisboa (Portugal), presented a huge amount of data on DCM and the different imaging modalities available in our era. More in particular Prof. Pinto spoke about echocardiography, nuclear cardiology, CT, CMR, PET and finally on Fusion Imaging.

Starting from the algorithm for the diagnosis of HF, the speaker presented very interesting data about Echo and systolic function,



2D Strain/Speckle Tracking Imaging



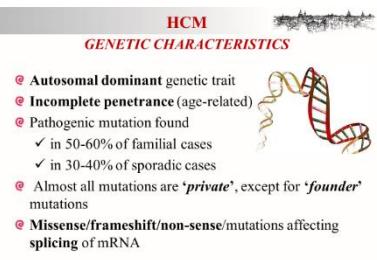
through the images of the main measures that can be taken. Prof. Pinto talked about all the available techniques like speckle tracking, transthoracic echocardiography, EchoCRT and others. In the main part of his presentation, Prof. Pinto talked about the value of the study of vortex and the prognostic prediction of vorticity. In conclusion, the speaker pointed out that Cardiac imaging has the potentiality to detail the DCM assessment in order to guide therapy.

- What's about cardiac magnetic resonance form the speaker point of view?
- What is the prognostic predictivity of vorticity?
- What is the potentiality of the 2D Strain/Speckle Tracking Imaging?
- What's about the central role of cardiac imaging in the HF diagnosis?
- What can be measured by Echo?
- What's about Echo and Systolic Function from the speaker point of view?

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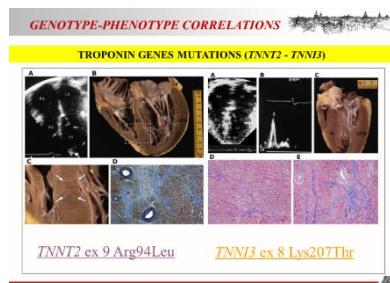
# Genetic screening in hypertrophic cardiomyopathy patients: clinical implications



patients, in order to explain the relationship between HCM



The Clinical implications of the genetic screening in patients affected by hypertrophic cardiomyopathy was the topic at the core of the lecture discussed by Prof. Calore from Padua (IT). In the main part of her talk the speaker presented very interesting data derived from genetic studies on familial hypertrophic cardiomyopathy and genetics from an etiopathogenetic and diagnostic point of view. More in particular the speaker talked about the genetic characteristics of HCM and the genetic testing, for a better characterization of patients and the related genetic screening. In the last part of her presentation, the speaker talked about the criteria leading to the pathogenetic mutations and finally, discussed the open issues related to the genetic testing.

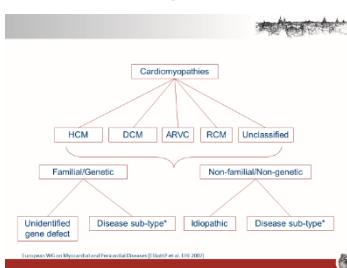


- What's about HCM as the disease of the sarcomere?
- What is the aetiology of HCM?
- What are the main genetic characteristics of HCM?
- Why to perform genetic testing in HCM patients?
- What are the suitable HCM patients for genetic testing?
- When is the right time to perform genetic testing?
- How to perform genetic testing?
- What are the main criteria leading to the pathogenetic mutations?

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# The diagnostic approach to the infiltrative cardiomyopathies



Prof. Elliott talked about the infiltrative cardiomyopathies and their diagnostic approach. The speaker, coming from London (UK), introduced his talk by presenting data on infiltration as the first defect leading to cardiomyopathy. Prof. Elliot went deeper in his presentation, by talking about the clinical pattern of a typical HCM patient from the beginning of his history to the final diagnosis. More in particular the speaker

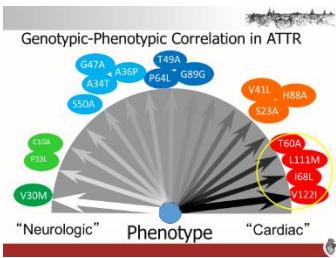
talked about amyloidosis and how to approach individuals with suspected heart muscle disease. In the main part of his lecture Prof. Elliot presented very interesting data on diagnosis, history and

familial examination of these patients. In the second part of his lecture Prof. Elliot spoke about myocarditis, its definition, the problems linked with the so called "gold standard", its incidence, its aetiology, the main clinical presentations and the diagnostic criteria for its detection. Finally, the speaker discussed about the persistent questions related to myocarditis from the diagnostic and therapeutic point of view.

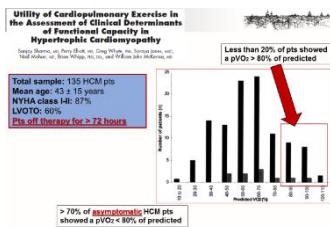
- 
- A complex flowchart titled "National Institute 2005 nomenclature". It starts with "Initial presentation" leading to "Cardiac MRI" or "Echocardiography". If "Cardiac MRI" is normal, it leads to "Normal or non-specific findings" and then "Reassurance". If "Cardiac MRI" shows "Abnormal findings", it leads to "Reassurance" or "Investigations". "Investigations" lead to "Normal or non-specific findings" and then "Reassurance". "Investigations" also lead to "Evidence of myocarditis" and then "Diagnosis of myocarditis". "Diagnosis of myocarditis" leads to "No myocarditis" and "Evidence of specific myocarditis" (which then leads to "Diagnosis of myocarditis").
- How do we define myocarditis?
  - How do we diagnose myocarditis?
  - How do we treat patients affected by myocarditis?
  - When should we suspect cardiac amyloidosis?
  - What is the diagnostic flow-chart in patients with clinically suspected cardiac amyloidosis?

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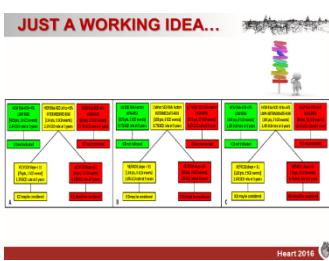


# Cardiopulmonary exercise testing in hypertrophic cardiomyopathy



Speaking about functional capacity assessment Prof. Magrì presented data on the utility of the cardiopulmonary exercise test and the determinants of the peak oxygen uptake. The speaker went deeper in his talk by discussing data on stroke volume, diastolic dysfunction, cardiac output and other clinical markers of exercise capacity in patients affected by hypertrophic cardiomyopathy.

In the final part of his lecture Prof. Magrì spoke about prognosis and the predictors of long-term outcomes in patients affected by hypertrophic cardiomyopathy, by highlighting the role played by CPET also in patients at high risk of sudden cardiac death. In conclusion, Prof. Magrì pointed out that CPET represents a safe and reliable approach for an estimation of the true exercise capacity in HCM patients.



- What are the main topics linked with the exercise capacity in HCM patients?
- What can we measure with CPET other than pVO<sub>2</sub>?
- What's about CPET and HCM prognosis?
- What is the possible application of CPET in HCM patients at high risk of sudden cardiac death?
- Why should CPET be routinely performed in HCM patients every 1-2 years from the speaker point of view?
- What are the main uses of the CPET-derived variables from the speaker point of view?

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# High Spatial Resolution Cardiovascular Magnetic Resonance in Patients with Hypertrophic Cardiomyopathy

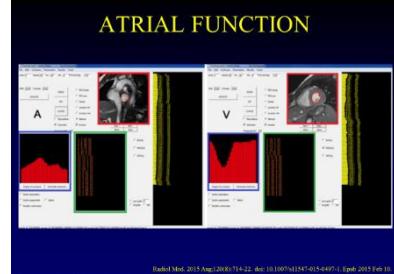


DIBIMED Sezione di Scienze Radiologiche Università degli Studi di Palermo

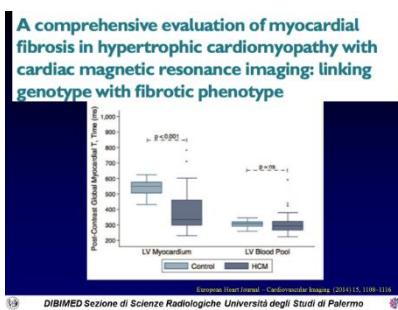
High Spatial Resolution Cardiovascular Magnetic Resonance in patients with Hypertrophic Cardiomyopathy was the topic of Prof. Midiri presentation. The speaker, coming from Palermo (IT), addressed the audience, by talking about the value of CMR. More in particular Prof. Midiri presented very interesting data on the CMR application in the detection of LV morphology and function, in myocardial fibrosis diagnosis and in differential diagnosis with other conditions.

differential diagnosis with other conditions. The speaker, at the beginning of his talk discussed about the 2014 ESC guidelines on hypertrophic cardiomyopathy management and diagnosis with the intention to introduce the CMR protocols to be applied in HCM diagnosis.

Prof. Midiri went deeper in his lecture by talking about the CMR protocols and more in particular, by presenting data on anatomy, LV function, LV thickness, Atrial function, LGE and quantitative analysis of late gadolinium enhancement evaluation and finally on Tagging module. In the last part of his lecture the speaker talked about the application of CMR in the diagnosis and management of Cardiac Tumors.



BioMed. 2015 Aug;20(8):714-22. doi: 10.1007/s11417-015-0497-1. Epub 2015 Feb 10.



Eur Heart J. 2014;35:1109-1116

- What are the relative merits of each non-invasive imaging modality for the assessment of HCM?
- What's about the stratification of the risk of sudden cardiac death in patients with HCM?
- What's about Tagging in HCM patients?
- What are the main measures detected with the LV protocol?
- What's about the detection of cardiac tumors with the application of the CMR protocols?

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# The system of high education in Italy and the role of the University of Palermo in the 210° anniversary of its foundation



Prof. Micari, Rector Magnificus of the University of Palermo spoke about its University founded in 1806, quite a relative young university the speaker highlighted, but characterized by very innovative ideas. Today the University is attended by 42.000 students and is the biggest university of Sicily, the speaker pointed out. More in particular Prof. Micari highlighted that this is a “generalistic” University but at the same time deeply involved in the growing of the territory.

Culture heritage is one of the key of the development of Sicily and this University is deeply involved in this task, the speaker pointed out. In the last part of his lecture, Prof. Micari spoke about the relationship between the University of Palermo and the Industries and on the so called “University third mission”. Finally, the speaker talked about the internationalisation of the Palermo University and the ERASMUS project, that involves more than 1000 students per year.

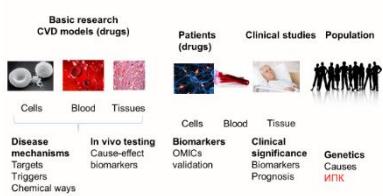
- Why did the king of Naples and Palermo, decide to found the University of Palermo?
- What are the main departments of the University of Palermo?
- What's about the exchange between the territory and the University?
- What's about the main activities of the University of Palermo?
- What is the quality of research of the University of Palermo?
- What's about of the so called “third mission” of the University of Palermo?

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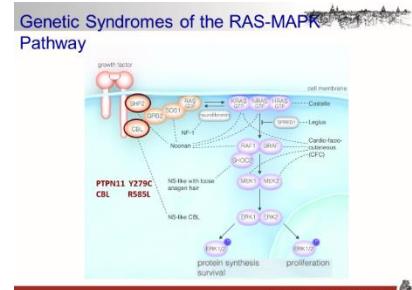
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# Translation Research in Cardiology

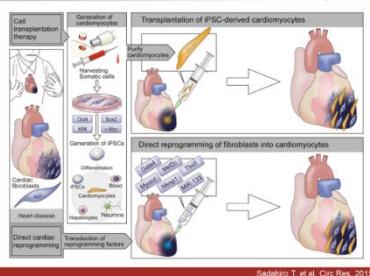
## Translational Research in Cardiology



approach. Going deeper in his lecture, the speaker discussed about the genetic syndromes of the RAS-MAPK pathway, the main epigenetic mechanisms like methylation, histone modifications, lncRNA interactions and their therapeutical application in HF patients. Prof. Shlyakhto presented also data on novel cardiac biomarkers like microRNA and its application in the prognosis and in the response to therapy in HF patients. In the main part of his lecture the speaker talked about myocardial protection by presenting very interesting data given by clinical studies on remote ischemic preconditioning, its effect on myocardial reperfusion and the role played by microvesicles, exomes and mitochondrial fusion and fission in this process. Finally, Prof. Shlyakhto spoke about cell technology and more in particular on cardiac repair through the implantation of mesenchymal stem cells or progenitors of cardiac myocardiocytes into the myocardium affected by post-MI scars and the autologous mitochondrial implantation. In conclusion, Prof. Shlyakhto pointed out that the introduction of new technologies like cell therapy, gene therapy, genome editing technology and others, will demand new qualified medical staff.



## Future of cardiac regenerative therapy



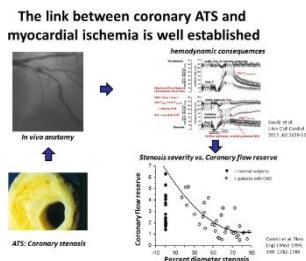
Satohira T, et al. Circ Res, 2015

- What's about myocardial rescue through autologous mitochondrial transplantation in ischemia-reperfusion?
- What are the main problems of MSCs using the translation's results into routine clinical practice?
- What is the algorithm of the heart's targeting with nanoparticles?
- What's about mitochondrial fusion and fission as new targets for cardiac protection?
- What's about microvesicles and exomes as biomarkers and regulators in myocardial ischemia-reperfusion?
- What's about the concept of remote ischemic conditioning presented by the speaker?

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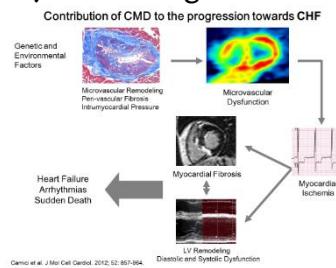
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# From Left Ventricular Hypertrophy to Dysfunction and Failure

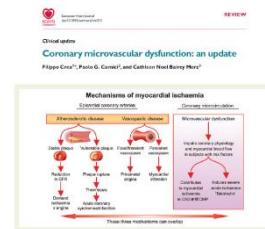


From Left Ventricular Hypertrophy to Dysfunction and Failure was the topic at the core of Prof. Camici presentation. The speaker, coming from Milan (IT), presented very interesting data, starting from the emerging concept of coronary microvascular disease. Prof. Camici went deeper in his lecture, by presenting a huge amount of data on coronary microvascular dysfunction and the mechanisms leading

to this disease from the vascular mechanisms to the extra-vascular mechanisms. In the second part of his talk Prof. Camici presented very interesting data on HCM patients affected by angina/ischemia



symptoms, by highlighting that almost 30% of patients affected by HCM have typical angina and/or ischemic signs despite normal coronary angiograms. More in particular the speaker talked about coronary remodelling in HCM, the end-stage HCM, the microvascular dysfunctions and the HCM prognosis and finally on the contribution of CMD to the progression towards CHF.

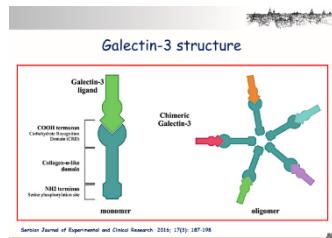


- What's about myocardial blood flow in patients affected by hypertrophic cardiomyopathy?
- What is the correlation between angina/ischemia and HCM?
- What are the main extra-vascular mechanisms leading to the coronary microvascular dysfunction?
- What are the vascular mechanisms leading to the coronary microvascular dysfunction?
- What's about fibrosis in primary and secondary LVH?
- What are the main cardiac and coronary alterations leading to the end-organ damage in patients affected by hypertension?

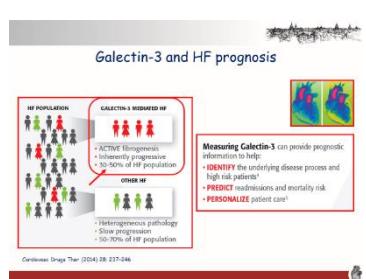
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# Diagnostic and prognostic role of galectin-3 in Cardiovascular Disease



Diagnostic and prognostic role of galectin-3 in Cardiovascular Disease was the topic discussed by Prof. Ciaccio. The speaker, coming from Palermo (IT), presented very interesting data about galectin-3 and its diagnostic and prognostic role. At the beginning of his lecture, Prof. Ciaccio spoke about the main galectin families, their architectural types, the structure and the Gal-3 gene organization and their interactions. The speaker went deeper in his lecture, by presenting a huge amount of data on the intracellular and extracellular function of Galectin-3. Speaking about the role of galectin-3 in the cardiovascular disease, Prof. Ciaccio highlighted the relationship between galectin-3 and MI leading to the onset and the progression of the fibrosis at the myocardial level and the relationship between



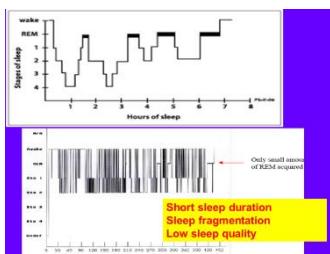
galectin-3 and the natriuretic peptides in patients with HF. Prof. Ciaccio presented very interesting data on the role played by galectin-3 in the development of HF. Finally, the speaker talked about the application of galectin-3 as a biomarker in patients affected by HF and the galectin-e inhibitors in the treatment of this disease. In conclusion, Prof. Ciaccio, pointed out that this biomarker can be useful in the selection of the HF patients that respond to specific therapies.

- What are the members of the Galectin Family of Mammalian Lectins?
- What's about the Galectin Family?
- What are the architectural types of Galectin?
- What's about the Galectin-3 structure?
- What are the main Galectins interactions?
- What are the intracellular and extracellular functions of Galectin-3?
- What's about Galectin-3 and angiogenesis?

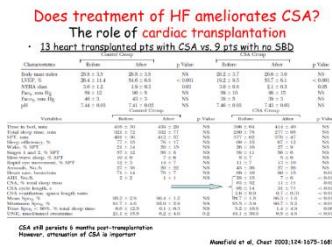
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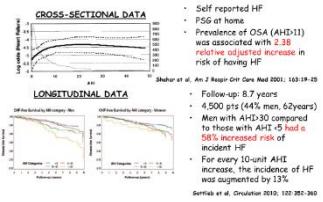
# Heart failure and sleep disorders



Prof. Parati from Milan (IT), spoke about heart failure and sleep disorders, starting from the main factors that may affect sleep quality and duration in HF patients. The speaker went deeper in his lecture, by presenting very interesting data on the prevalence, the pathophysiology and pathogenesis, the progression and prognosis and finally on the treatment. Speaking about prevalence, Prof. Parati presented data on obstructive and central sleep apnoea prevalence, by highlighting that patients affected by these diseases have a 58% increased risk of incident HF. Talking about pathophysiology and pathogenesis, Prof. Parati presented data on risk factors like male gender, atrial fibrillation, age and hypoxia. Talking about prognosis, the speaker highlighted that the HF patients affected by not treated central and obstructive apnoea are exposed to a worst outcome. Talking about treatment, Prof. Parati presented data given by clinical trials on the effects of diuretics, exercise rehabilitation, atrial overdrive pacing, nasal continuous positive airway pressure therapy, resynchronization treatment and finally on cardiac transplantation. In the final part of his presentation, the speaker talked about the effect of the OSA and CSA treatment on the HF evolution, by highlighting that there is a lack of data produced by randomized clinical trials. In conclusion Prof. Parati pointed out that in order to clearly define the effect of OSA and CSA on the HF evolution more evidences are needed.



Prevalence of HF in patients controlled for OSA  
The Sleep Heart Health Study

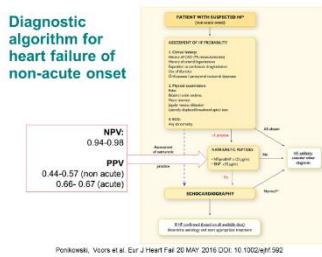


- Does treatment of CSA and OSA ameliorate HF?
- What's about CSA and OSA as prognosticators of adverse outcome in HF patients?
- What is the pathophysiology of Central and Obstructive apnoea?
- What's about the prevalence of HF in patients affected by OSA?
- What's about the prevalence of OSA and CSA in HF patients?

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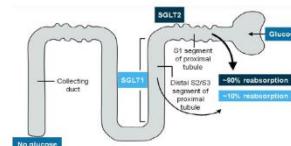
# The European Guidelines 2016 on Acute and Chronic Heart Failure



The European Guidelines 2016 on Acute and Chronic Heart Failure, was the topic discussed by Prof. Metra from Brescia (IT), more in particular the speaker presented very interesting data on the novelties driven by these guidelines, like a new algorithm for the HF diagnosis in the non-acute setting, the new classification concerning the patients with HF with mid-range EF, the early use of statins, ACE-inhibitors and Beta-blockers in patients with asymptomatic left ventricular dysfunction and at high risk of coronary artery disease, the use of SGLT-inhibitors in diabetic patients, the implementation of a life-saving pharmacotherapy in HFrEF patients, by combining ACE-I, Beta blockers, MRA and the Sacubitril-Valsartan combination, the ICD implementation in HF patients affected by arrhythmia and the implantation of a cardiac resynchronization therapy in HF patients with LVEF < 35%. In the last part of his lecture, Prof. Metra talked about the new recommendations for patients affected by acute HF and the indication on the enrolment of the patients affected by HF in a multidisciplinary care management program in order to reduce the risk of HF hospitalization and mortality.

## SGLT-2 inhibitors

Inhibit proximal tubular glucose reabsorption, cause diuresis and natriuresis, lower BP and reduce weight. Also renoprotective (in diabetes)?



Recommendations for exercise, multidisciplinary management and monitoring of patients with HF					
Recommendations	Class <sup>a</sup>	Level <sup>b</sup>	Recommendations		
It is recommended that regular aerobic exercise is encouraged in patients with HF to improve functional status and reduce the risk of HF hospitalization.	I	A	National HF primary care for long-term follow-up may be considered as an essential element of optimal therapy to monitor for changes in clinical status, disease progression and patient adherence.	IIa	B
It is recommended that regular aerobic exercise is encouraged in individuals with HF to reduce the risk of HF hospitalization.	I	A	Monitoring of pulmonary artery pressure by echocardiography or implantable hemodynamic monitoring (IHM) may be considered in symptomatic patients with HFrEF and HF hospitalization in order to reduce the risk of resources HF related admissions.	IIb	B
It is recommended that patients with HF are referred to multidisciplinary care management programs to reduce the risk of HF hospitalization and mortality.			Multiparameter monitoring based on ICD (implantable cardioverter defibrillator) may be considered in symptomatic patients with HFrEF (LVEF <35%) in order to improve clinical outcomes.	IIIa	B

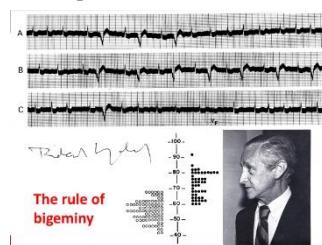
Ponikowski P, Voors AA, Anker SD, et al. Eur J Heart Fail 2016; DOI: 10.1002/ejhf.592

- What are the main recommendations for LVAD implantation?
- What's about the INTERMACS stages for patients with advanced HF?
- What's about the treatment of Acute Heart Failure?
- What are the main points of the recommendations for cardiac resynchronization therapy implementation?
- What's about the diagnosis and treatment of acute and chronic heart failure?

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# Atrial fibrillation with wide QRS complexes: ventricular origin, aberrant conduction or preexcitation?



Prof. Oretto from Messina (IT), spoke about atrial fibrillation with wide QRS complexes, and its etiology, by presenting very interesting data on three main topics like aberrant conduction, ventricular origin and preexcitation, with the intention to determine the real origins of this type of atrial fibrillation. More in particular the speaker talked about the actual R-R interval, the preceding R-R cycle, the pause following the wide beat, the wide QRS complex morphology and finally about the coupling interval of wide QRS complex. Prof. Oretto went deeper in his lecture and presented a lot of ECG data indicative for any of these pictures. Among these topics,

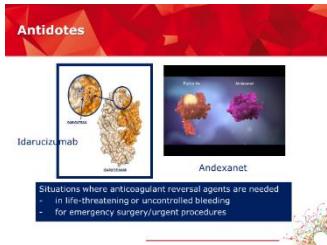
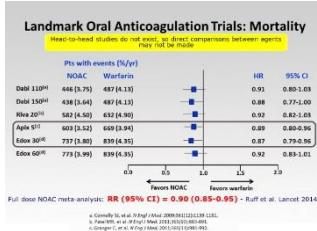
he spoke about the so called “Ashman phenomenon” and about Linking as the concealed retrograde conduction of an impulse that penetrates into a section of a re-entry circuit in which the same impulse had been anterogradely blocked. Speaking about the wide QRS complex morphology, Prof. Oretto pointed out that a QS morphology in lead V6 cannot be observed in any case of aberrant conduction of preexcitation.

- What is the rule of bigeminy?
- What's about the actual R-R cycle and the preceding R-R cycle?
- When does aberration occur based on the explanation presented by the speaker?
- What's about linking?
- What's about the wide QRS complex morphology?

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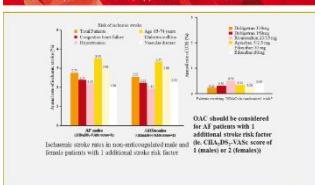
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# Oral anticoagulant therapy: when, which?



Oral anticoagulant therapy: when, which? was the topic discussed by Prof. De Caterina in his lecture. The speaker coming from Chieti (IT), talked about NOACs as life-saving drugs, the definition of non-valvular AF, the risk scores and OAC in low thrombotic risk, the focus on elderly, the registries and subgroups, the approved dosing vs trial protocols and finally about antidotes. Prof. De Caterina presented very interesting data on all these topics in order to find a valuable answer to all these questions, by highlighting that: NOACs are really life-saving drugs and the elderly benefit from their use. Finally, the speaker pointed out that antidotes for NOACs have been developed and one of them, idarucizumab, is already available.

Is OAC Necessary in AF Patients with a CHA<sub>2</sub>DS<sub>2</sub>-VASc Score=1 (males) or 2 (females)? A nationwide cohort study  
Ciblin, Liu, ... Lip, Chen. JACC 2015; 65(7): 838-42. Presented at ESC 2014

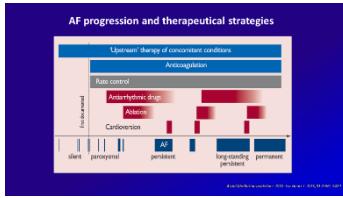


- What's about idarucizumab?
- What are the main antidotes presented by the speaker?
- What's about Edoxaban FDA and EMA approval?
- What's about the underdosing NOAC prescription?
- What are the main ARISTOTELE outcomes?
- What's about rivaroxaban in different populations in real world?

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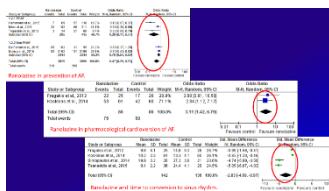
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# Cardioversion or Ablation of atrial fibrillation: state-of-the-art and future perspectives

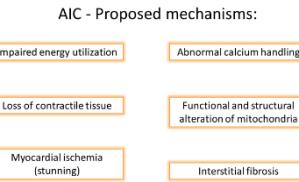


Prof. Capucci from Ancona (IT), presented very interesting data on this topic: “the state of the art and future perspective of cardioversion or ablation of atrial fibrillation”. The speaker went deeper in his lecture by presenting a huge amount of data given by the main clinical trial conducted on patients affected by atrial fibrillation. AIC - Proposed mechanisms: Impaired energy utilization Abnormal calcium handling

fibrillation. At the beginning of his talk, the speaker presented data on the rate control compared with rhythm control for the prevention of death and morbidity for cardiovascular causes. In the main part of his presentation Prof. Capucci spoke about the therapeutical tools available for the treatment of atrial fibrillation, catheter ablation and on the oral antiarrhythmic drugs used after



and its combination with metoprolol, dronedarone, amiodarone, vernakalant and ranolazine. In conclusion, Prof. Capucci pointed out that the antiarrhythmic drugs are well known AF therapies with very few surprises when drugs properties and indications are followed and that catheter ablation remains quite empirical.

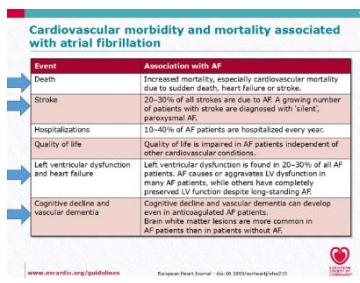


- What are the main arrhythmia-induced cardiomyopathy proposed mechanisms?
  - What's about ranolazine in the atrial fibrillation control?
  - What are the main problems linked to catheter ablation in AF patients?
  - What's about flecainide in patients with atrial fibrillation?
  - What is the main activity of dronedarone in AF?
  - What's about the effect of amiodarone and digitalis?

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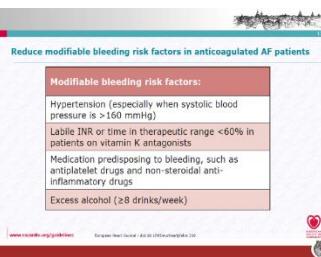
# ESC Guidelines 2016 on Atrial Fibrillation



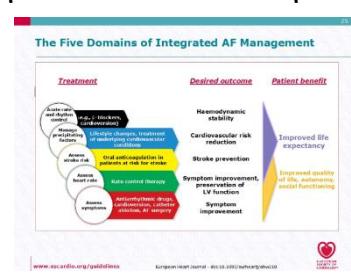
management and its five domains, the prediction of stroke and bleeding risk and their prevention, the diagnostic workup of AF patients with a particular attention to the transthoracic

The main topic at the core of Prof. Carerj presentation, was ESC guidelines on Atrial Fibrillation. The speaker, coming from Messina (IT), presented very interesting data given by the 2016 ESC guidelines on atrial fibrillation management. More in particular, Prof.

Carerj talked about the screening of AF for its early detection in asymptomatic patients, the integrated AF



echocardiography, the rhythm control therapy with a particular attention to the management of anticoagulation after ischemic stroke or intracranial bleeding and finally about the catheter ablation as the rhythm control therapy of choice in patients with symptomatic recurrences of paroxysmal AF. In conclusion, the speaker pointed out that the 2016 ESC AF guidelines can be reviewed in only 17 bullet points as simple rules for guiding diagnosis and management of AF patients.

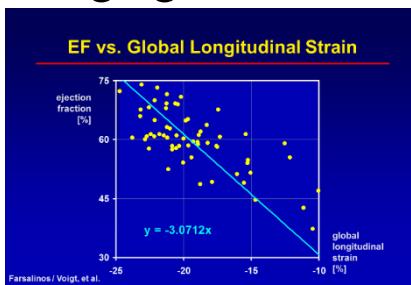


- What's about catheter ablation of atrial fibrillation?
- What are the five domains of the integrated AF management?
- What's about the long-term heart rate control in patients with atrial fibrillation?
- What are the key points of the rhythm control therapy?
- What is the diagnostic workup of atrial fibrillation patients?
- What's about stroke prevention in atrial fibrillation patients?
- What are the key points of the screening for atrial fibrillation patients?

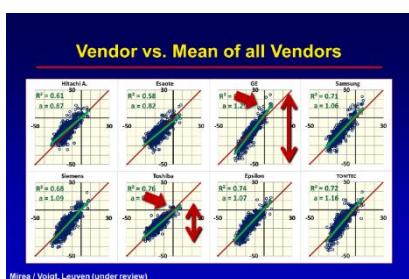
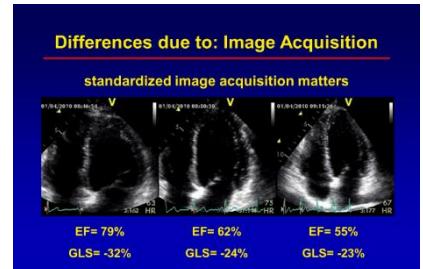
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# Inter-vendor variability of strain measurements and the joint efforts of EACVI, ASE and Industry to standardize strain imaging



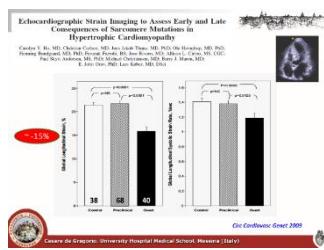
Prof. Voigt presented very interesting data on Aortic stenosis. The speaker coming from Leuven (Belgium) talked about inter-vendor variability of strain measurements and the joint efforts of EACVI, ASE and Industry for the standardization of strain imaging. More in particular the speaker presented a huge amount of data on the strain rate imaging, on speckle tracking and on global longitudinal strain as a new parameter of the LV functions. In the main part of his presentation the speaker talked about the description of the quality of the measurements of global strain and the differences between vendors, by presenting data on image acquisition, and data processing in order to present the EACVI-AVE Industry task force for the GLS measurements standardization. Prof. Voigt talked also about the two Inter-vendor comparative studies and their results. In the second part of his lecture, the speaker talked about the regional function assessment with particular attention to the impact of timing on the measurements. In conclusion, Prof. Voigt pointed out that global longitudinal strain is ready for its application in clinical practice, it is a robust and reproducible technique as a valuable complement to traditional function parameters, but inter-vendor differences are still present and must be considered.



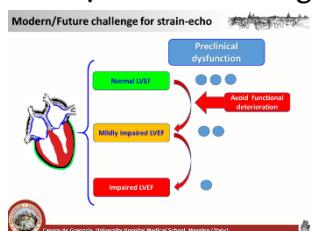
- What's about the predictive value of global longitudinal strain compared to EF?
- What's about the normal values of global longitudinal strain between different vendors?
- Where do the differences come from?
- How to standardize GLS measurements?
- What's about accuracy in global longitudinal strain measurements?
- What's about strain standardization of regional function?
- How to define end-diastole and end-systole?

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# Cardiomyopathies

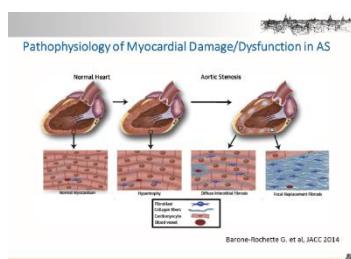


The main topic at the core of Prof. De Gregorio presentation, was Cardiomyopathies. The speaker, coming from Messina (IT), presented very interesting data, starting from the ultrasound investigation of the human heart and its main measurements. More in particular Prof. De Gregorio spoke about the application of global longitudinal strain in ischemic heart disease, hypertrophic cardiomyopathy and cardiac amyloidosis. In the second part of his lecture, the speaker talked about the GLS-related prognosis in HCM and about the atrial wall deformation. Finally, Prof. De Gregorio spoke about the determinants of strain dysfunction in cardiomyopathies and more in particular on longitudinal function and twisting, longitudinal and radial function and on circumferential function and untwisting. In conclusion, the speaker pointed out that normal ranges should be better established through the improvement of the technical consistency, for a better diagnosis of the preclinical dysfunctions.

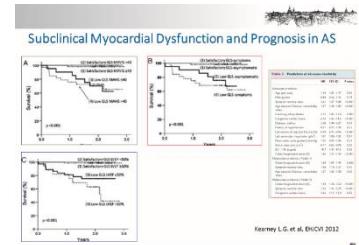


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# Valvulopathies



Prof. Agricola from Milan (IT) spoke about valvulopathies. The speaker presented very interesting data on the LV dysfunction as a background of valvulopathies, their scientific evidences and finally on the clinical application of deformation imaging. Going deeper in his talk, Prof. Agricola presented data on the early myocardial dysfunction in the presence of aortic stenosis (AS) and on the pathophysiology of myocardial damage in AS. Prof. Agricola talked also about GLS applied to the diagnosis of myocardial fibrosis in patients affected by AS and about the detection of the myocardial functions after AVR. In the second part of his presentation, the speaker talked about aortic and mitral regurgitation and the GLS application for the management of these patients. Finally, Prof. Agricola presented data on mitral stenosis and the right ventricular function in VHD.



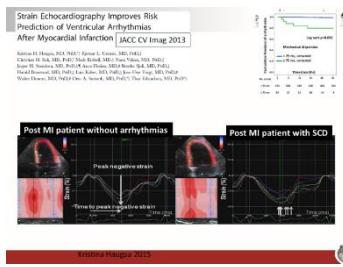
In conclusion, the speaker pointed out that the earlier detection of subclinical myocardial dysfunction by 2DSTE may permit the identification of those patients at high risk of irreversible myocardial damage.

- What's about the subclinical myocardial dysfunction and the prognosis in AS
- What's about GLS and myocardial fibrosis in AS patients?
- What are the main points of the pathophysiology of the myocardial dysfunction in AS presented by the speaker?
- What's about aortic regurgitation?

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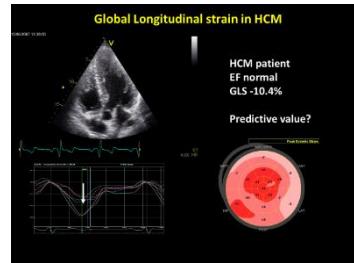
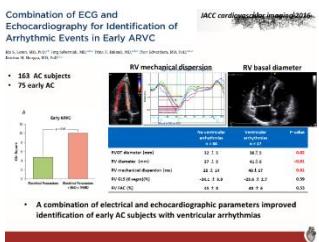
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# Ventricular arrhythmias



superiority of GLS in the detection of arrhythmias. In the main part of her presentation, the speaker talked about the use of GLS in patients affected by HCM and its predictive value. In the last part of her talk, Prof. Hermann Haugaa presented several data on

patients affected by ventricular cardiomyopathy and the application of imaging in the diagnosis of the early phases of the disease. In conclusion, the speaker pointed out that strain echocardiography has a prognostic value in patients affected by ventricular arrhythmias after myocardial infarction or secondary to hypertrophic and arrhythmogenic cardiomyopathy.

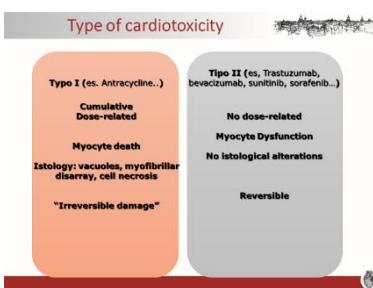


- What are the task force criteria for ARVC diagnosis?
  - What's about GLS in HCM patients?
  - What's about the risk stratification and the preventive management of patients affected by HCM?
  - What's about the prognosis and the risk stratification of patients affected by SCS?
  - What's about the comparison between GLS and EF for the early detection of arrhythmias in STEMI and NSTEMI patients?

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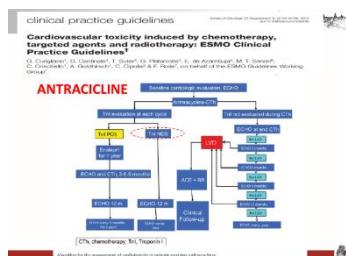
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## Biomarkers



Prof. Novo from Palermo (IT) spoke about biomarkers in cardiology, by presenting very interesting data on this topic. More in particular the speaker talked about cardiotoxicity, its types and timing and about the most effective and widely used biomarkers like cardiac troponin, brain natriuretic peptides and its N-terminal fragment. Going deeper in her lecture, Prof. Novo presented very interesting data on

the use of troponin and more in particular of his cTnI unit for the early detection of the damages derived from chemotherapy, by highlighting the advantages of its application. In the second part of her presentation the speaker talked about other



Proposed diagnostic tools for the detection of cardiotoxicity			
Techique	Capacity enable diagnostic criteria	Advantage	Major limitations
Echocardiography	<ul style="list-style-type: none"> <li>- 1D-Doppler LVEF</li> <li>- 2D-Doppler LVEF</li> <li>- GLS</li> </ul>	<ul style="list-style-type: none"> <li>• QFR &gt; 15% per cent para-oxonazine</li> <li>• GLS &lt; -14%</li> <li>• LVEF &lt; 55% per cent</li> <li>• LVEF &lt; 45% per cent using 10% cut-off</li> </ul>	<ul style="list-style-type: none"> <li>• Wide availability</li> <li>• Non-invasive</li> <li>• Assessment of haemodynamics and other cardiac structures.</li> </ul>
Nuclear cardiac imaging (MUGA)	<ul style="list-style-type: none"> <li>- MUGA</li> <li>- Ejection fraction decrease in patients with cardiotoxicity</li> </ul>	• Reproducibility	<ul style="list-style-type: none"> <li>• Confusion between ejection fraction and other functional information on other cardiac structures.</li> </ul>
Cardiac magnetic resonance	<ul style="list-style-type: none"> <li>- T1-weighted and T2-weighted MRI</li> <li>- Cardiac MRI</li> <li>- T1/T2 mapping</li> </ul>	<ul style="list-style-type: none"> <li>• Assessing myocardial function</li> <li>• Detection of myocardial fibrosis using T1/T2 mapping and late gadolinium enhancement</li> </ul>	<ul style="list-style-type: none"> <li>• Availability</li> <li>• Cost</li> <li>• Patient safety (cardiac arrhythmias, breath hold, leg ischaemia).</li> </ul>
Cardiac biomarkers	<ul style="list-style-type: none"> <li>- Troponin I</li> <li>- N-terminal pro-B-type natriuretic peptide</li> <li>- BNP</li> <li>- NT-proBNP</li> </ul>	<ul style="list-style-type: none"> <li>• Assessing myocardial infarction who benefit the most</li> <li>• Assessing risk of HF and Myocarditis in a subclinical phase of heart failure</li> <li>• Other biomarkers</li> </ul>	<ul style="list-style-type: none"> <li>• Ability to establish the significance of false-negatives</li> <li>• Risk for toxicity or adverse effect clearly established</li> </ul>

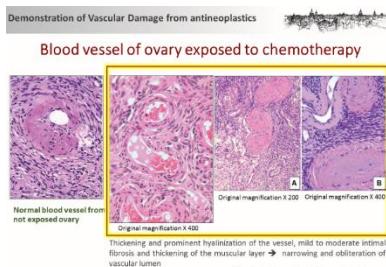
**biomarkers like BNP and NT-proBNP, by presenting very interesting data given by clinical studies conducted on patients treated with chemotherapy agents.** Finally, Prof. Novo presented data on new possible biomarkers like ROS, hs-CRP, GPBP, H-FABP and mRNAs. In conclusion Prof. Novo pointed out that the integrated evaluation of biomarkers and imaging (GLS) increases the sensitivity and the specificity in the detection of cardiotoxicity in patients treated with chemotherapy agents.

- What are the main topics of cardio-oncology from the speaker point of view?
  - What's about the type I and II Cardiotoxicity?
  - What is the main definition of cardiotoxicity from the speaker point of view?
  - What are the steps for the evaluation of the cardiotoxicity risk presented by the speaker?
  - What are the limits of the EF detection?
  - What are the characteristics of the ideal biomarker presented by the speaker?
  - What's about Troponin, Natriuretic Peptides and the emerging biomarkers?

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# Vascular damage



second part of her presentation, Prof. Zito presented data on the effects of other chemotherapy agents than VEGF inhibitors, like trastuzumab, cisplatin, cyclophosphamide, 5-fluorouracil, anthracyclines and on the pathophysiology of the vascular damage due to radiotherapy.

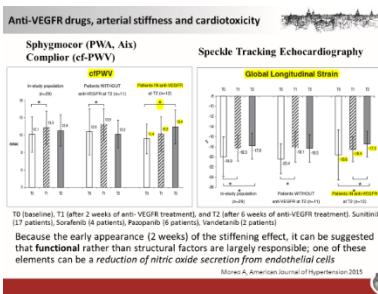
Prof. Zito from Messina (IT) spoke about Vascular damage, by presenting very interesting data on the metabolic pathways leading to vascular damage in patients treated with chemotherapy agents. More in particular the speaker talked about VEGF/VEGFR inhibitors

## Hypertension and VEGF-Inhibitors

Drug	Number of studies included	Number of patients	Incidence of all grades of HTN, %	Incidence of grades 3-4 HTN, %
Bevacizumab	20	6754	23.6	7.9
Sunitinib	13	4999	21.6	6.8
Sorafenib	13	2492	15.3	4.4
Axitinib	10	1908	40.1	13.1
Vandetanib	11	3154	24.2	6.8
Regorafenib	5	750	44.4	12.5

Most recent reviews and meta-analyses on the incidence of hypertension with major VEGF treatment

ESC Position Paper EHJ 2016; 37:2768-2801



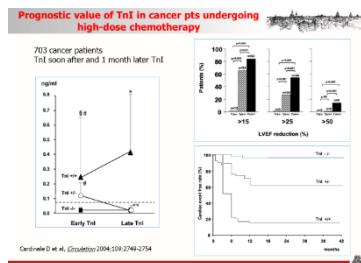
In the last part of her lecture, the speaker talked about the strategies to be applied for the prevention of vascular damage in case of hypertension, thromboembolic disease, coronary artery disease, peripheral arterial disease, stroke and pulmonary hypertension. Finally, Prof. Zito presented data on the strategies to be implemented for an early diagnosis and treatment.

- What there are the main characteristics of the Vascular damage from the speaker point of view?
- What's about endothelial dysfunction?
- What are the main factors that possibly contribute to the chemotherapy vascular toxicity?
- What are the main clinical manifestations of the vascular damage?
- What is the pathophysiology of the vascular damage caused by VEGF/VEGFR?
- What's about the effect of 5-fluorouracil?
- What are the vascular damages of anthracyclines over time?
- What is the pathophysiology of the vascular damage due to radiotherapy?
- What are the main strategies for the vascular damage prevention presented by the speaker?
- What are the main anti-VEGFR drugs presented by the speaker?

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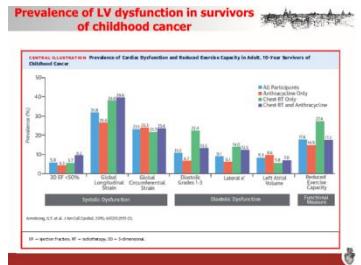
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# Multimodality Imaging approach

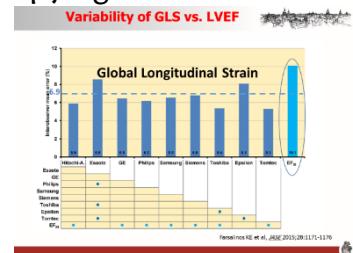


Prof. Galderisi from Naples (IT), spoke about the Multimodality Imaging approach. The speaker at the beginning of his lecture, talked about the needs of oncologists, like the use of less toxic anti-cancer drugs on the heart, tools for the diagnosis of the overt and the early toxicity of the chemotherapy agents and tools for monitoring the adverse CV events of these agents and radiotherapy. Going deeper in his lecture, Prof. Galderisi

presented very interesting data on the strategies for the early detection of cardiotoxicity, divided into biomarkers and LV function detection. The speaker, more in particular, talked about



the main imaging techniques used for the detection of the EF level in patients treated with anti-cancer drugs, by presenting data on the 2D echo and on the global longitudinal strain, their advantages and limits. In conclusion, Prof. Galderisi pointed out that physicians have two ways for initiating a cardio-protective therapy in patients treated with chemotherapy agents, the LVEF way and the GLS based way.

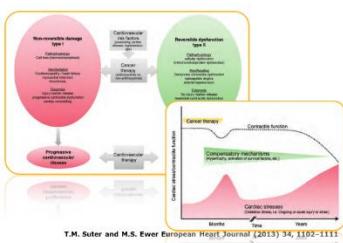


- What do the oncologists need from the cardiologists?
- What are the main strategies for the early detection of cardiotoxicity?
- What is the prognostic value of Tn I in cancer patients treated with high-dose chemotherapy?
- What are the echo criteria for the anti-cancer therapy drop-out?
- What's about GLS variability compared to LVEF?
- What's about GLS reproducibility?
- What's about the early detection of cardiotoxicity by using GLS?

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# European Position Paper on Cardio-Oncology



Prof. Tocchetti from Naples (IT), spoke about the European Position Paper on Cardio-Oncology. The speaker presented very interesting data on the strategies for preventing cardiotoxicity induced by antineoplastic drugs, by speaking about the evaluation of novel sensitive strategies in detecting early cardiovascular damage, the comprehension of the cardiac role of proteins involved in cancer biology and finally about the cardioprotective approaches.

Going deeper in his lecture Prof. Tocchetti presented very interesting data on the malignant effects of anthracyclines on the heart, on the cardiomyocyte-intrinsic molecular mechanisms underlying anthracyclines toxicity and on the paracrine molecular mechanism underlying main TKI cardiotoxicity. In the second part of his lecture Prof. Tocchetti talked about the methods for identifying patients at high risk of CAD, Arrhythmias and QT prolongation, by presenting data on the proposed diagnostic tools for the detection of cardiotoxicity in cancer-treated patients.

Finally, the speaker talked about the cardioprotective strategies, by presenting data on the protective effects of ranolazine, telmisartan, statins and beta blockers.

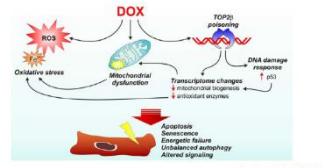
Table 10 Risk factors for QT prolongation in cancer patients

Correctable	Non-correctable
Electrolyte imbalance	
- Nausea and vomiting	Family history of sudden death (congenital arrhythmia)
- Diuretics	Genetic predisposition (e.g. polymorphisms)
- Treatment with loop diuretics	Baseline QTc interval prolongation
- Hypokalemia	- Advanced age
- Hyperkalemia (≥ 5.1 mg/dL)	- Male sex
Hypothyroidism	- Myocardial infarction
Concurrent use of QT-prolonging drugs	- Impaired hepatic drug metabolism
- Anti-nauseants	
- Anti-emetics	
- Diuretics	
- Antifibrillatory	
- Cholinergics	
- Antidepressants	
- Antipsychotics	
- Antidiabetic	
- Antihistamine	

LQTS = long QT syndrome.

Zamorano et al, Eur Heart J 2016

Cardiomyocyte-intrinsic molecular mechanisms underlying anthracycline cardiotoxicity.

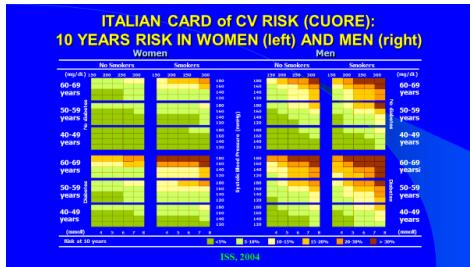


- What are the main the main strategies for the prevention of the cardiotoxicity induced by antineoplastic drugs?
- What's about the incidence of LV dysfunction induced by the main chemotherapy agents?
- What are the cardiomyocyte-intrinsic molecular mechanisms underlying anthracycline cardiotoxicity?
- What are the paracrine molecular mechanism underlying main TKI cardiotoxicity?
- What are the proposed diagnostic tools for the detection of cardiotoxicity?
- What's about CAD in cancer treatment?
- What's about arrhythmias in cancer treatment?
- What's about QT prolongation in cancer therapy?
- What are the main characteristics of the protective effect of ranolazine in doxorubicin treated patients?

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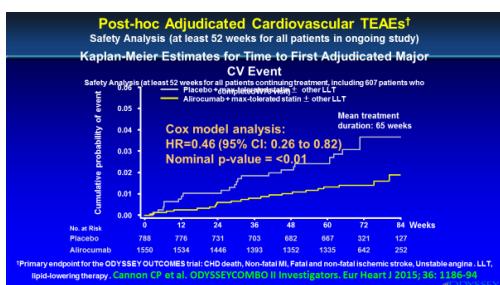
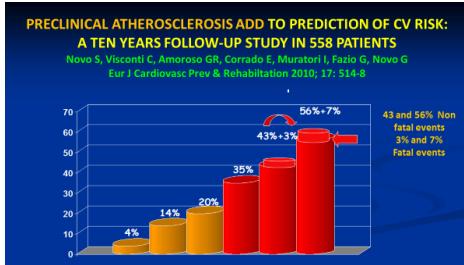
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# European Guidelines on Cardiovascular Prevention 2016



Prof. Novo, chairman of this symposium, spoke about the 2016 European Guidelines on Cardiovascular Prevention. The speaker presented very interesting data, by comparing the European guidelines on cardiovascular disease and the guidelines for the management of dyslipidaemias. At the beginning of his lecture the speaker discussed on the recommendations about the assessment

of total cardiovascular risk and compared the Euro score with the Italian score given by the so called "Progetto Cuore", by highlighting the different methods applied for the risk calculation between them. Prof. Novo went deeper in his lecture, by presenting data on the risk factors like smoking, diet, physical activity, body weight, blood pressure, HDL-C, triglycerides, diabetes and LDL-C. More in particular the speaker talked about the recommendations in nutrition and on new risk factors like rheumatoid arthritis and other inflammatory diseases. Prof. Novo presented also data on socio economic status and psychosocial risk factors. Talking about atherosclerotic risk, the speaker presented very interesting data on a study conducted on the preclinical atherosclerotic detection for a better calculation of the total CV risk. In the second part of his lecture the speaker talked about the



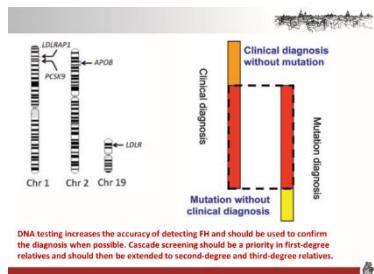
recommendations for post-ACS patients and the ones affected by moderate and severe CKD. Finally, Prof. Novo presented data on the recommendations for the pharmacological treatment of elevated LDL-C, also in patients affected by diabetes, the recommendations on BP level in the elderly and those one for the vaccination therapy and the cardiovascular disease prevention in primary care.

- What are the main differences between euroscore and cuore cards?
- What are the recommendations for individuals < 50 years of age for the CV prevention?
- What are the key points of the Italian CARD of CV risk?
- What's about the risk factor goals and target levels for important cardiovascular risk factors?
- What are the main recommendations on nutrition?
- What are the main psychosocial risk factors discussed by the speaker?
- What are the main recommendations for the lipid control?

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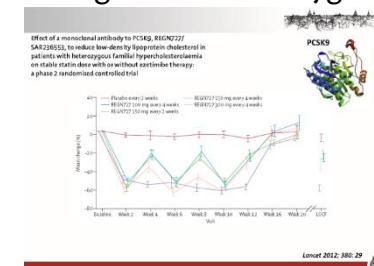
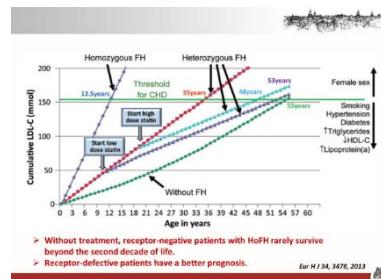
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# Familial hypercholesterolemia: gaining decades of life by optimizing detection and treatment



Prof. Manzato from Padua (IT), spoke about Familial hypercholesterolemia: gaining decades of life by optimizing detection and treatment. The speaker presented very interesting data on the main characteristics of the familial hypercholesterolemia, how to detect and how to treat. Speaking about the methods for its detection, Prof. Manzato

highlighted the multigenetic condition at the basis of the familial hypercholesterolemia and presented the loci involved in these mutations, the majority at the level of the LDL receptor and others at the level of APOB and PCSK9 receptor protein. More in particular the speaker pointed out that not in all patients affected by this disease it is possible to identify the specific genetic mutations and on the other hand, not all the patients with genetic mutations present high LDL-cholesterol levels. The speaker went deeper in his presentation, by discussing on the criteria for the diagnosis of familial hypercholesterolemia. Talking about homozygosity, Prof. Manzato highlighted that there are three conditions: the true homozygote, the compound heterozygosity and finally the double heterozygosity with different mutations at different levels. The speaker presented also data on the treatment algorithm to be applied in these patients, with the aim to maintain the less LDL-cholesterol level as possible. Finally, Prof. Manzato spoke about therapy, by presenting data on statins, on PCSK9 inhibitors and on lomitapide.

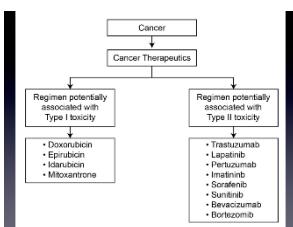


- What are the main criteria for the clinical diagnosis of familial hypercholesterolemia?
- What are the three different LDL cholesterol distributions in normal population, in heterozygous for LDLR mutations and in homozygous for LDLR mutations?
- What are the main characteristics of homozygous patients?
- What's about the relative risk of CHD for FH patients before and after statins?
- What is the treatment algorithm for sever FH patients?
- What's about the effect of PCSK9 inhibitors on the LDL-C levels in FH homozygous patients?
- What's about the effect of lomitapide on LDL-C levels in FH homozygous patients?

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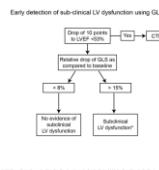
# Cardio Oncology 2017



Cardio Oncology 2017 was the topic discussed by Prof. Plana in his presentation. The speaker coming from Houston (USA) spoke about the methods used for the evaluation of the cardiotoxicity risk in patients treated with chemotherapy agents. More in particular Prof. Plana presented very interesting data on ejection fraction and its addressed issues like CTRCD, the mechanisms leading to the LVEF reduction and the sub-clinical LV dysfunction. In the second part of his lecture the speaker talked about Global longitudinal strain, its reproducibility and its cost effectiveness ratio for a better and early detection of cardiovascular toxicity signs and symptoms in patients treated with chemotherapy agents. Going deeper in his lecture, Prof. Plana presented data on the intra and inter-observer variability between GLS and EF, on the reproducibility and on the vendor dependence biases and finally, on the strain- targeted cardioprotection and its QALY index. In conclusion, the speaker pointed out that the intra and inter-observer variability of GLS proved to be superior to that of EF and other conventional echocardiographic parameters, hence GLS may be safely used in routine clinical practice.

	QALY	Cost
EFGCP	3.53	\$7033
UCP	3.64	\$5967
SGCP	3.79	\$4159

reduction and the sub-clinical LV dysfunction. In the second part of his lecture the speaker talked about Global longitudinal strain, its reproducibility and its cost effectiveness ratio for a better and early detection of cardiovascular toxicity signs and symptoms in patients treated with chemotherapy agents. Going deeper in his lecture, Prof. Plana presented data on the intra and inter-observer variability between GLS and EF, on the reproducibility and on the vendor dependence biases and finally, on the strain- targeted cardioprotection and its QALY index. In conclusion, the speaker pointed out that the intra and inter-observer variability of GLS proved to be superior to that of EF and other conventional echocardiographic parameters, hence GLS may be safely used in routine clinical practice.



\* The data supporting the initiation of new treatments for the treatment of subclinical LV dysfunction is limited.

- What's about the cardiac dysfunction related to cancer therapeutics?
- What is the echocardiographic reproducibility for the evaluation of the cancer patients?
- What's about the reproducibility and the vendor dependence?
- What's about the inter and intra-observer variability from the speaker point of view?
- What's about the comparison of inter-vendor variability?
- What's about strain guided cardioprotection and the QALY index?

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