Discipline MCP5875 **H** Inovations on the Diagnosis and Treatment of Arrhythmias, Syncope and Prevention of Sudden Cardiac Death

Concentration area: 5131

Creation: 13/12/2016

Activation: 13/12/2016

Credits: 2

Workload:

Theory	Practice	Study	Duration	Total
(weekly)	(weekly)	(weekly)		
4	13	13	1 weeks	30 hours

Professors:

Denise Tessariol Hachul

Mauricio Ibrahim Scanavacca

Francisco Carlos da Costa Darrieux

Objectives:

To update and motivate a critical analysis of the diagnosis approaches and management (both clinical and interventionists) of cardiac arrhythmias and syncope, as well as of prevention of sudden cardiac death. At the end, the student is expected to achieve a critical sense on the interpretation of the methods, recognizing its potentialities and limitations. Core Question How to diagnose and manage a patient with arrhythmia or syncope, recognizing the risk of sudden cardiac death and achieving the better therapeutic option, considering cost-effectiveness and the influence on the patient's quality of life.

Rationale:

The risk assessment and treatment of heart rhythm disorders have been modified and advanced substantially in recent years, as a consequence of the development of the technology and recognition of the anatomical and electrophysiological substrates, autonomic modulation and, more recently, molecular origins of cardiac arrhythmias. These instruments provided earlier and more accurate diagnoses, as well as deepened pathophysiological knowledge at the functional, macroscopic and even at the ultra structural level. In this context, there has been constant progresses and accelerated development of new therapeutic options, pharmacological and non-pharmacological, for patients suffering from heart rhythm disorders. Therefore, the understanding of the methods used for its investigation, as well as the development of adequate critical analysis in the decision making to treat them are fundamental for the improvement of researchers in this broad area of cardiology.

Content:

The course will be divided into 4 modules. The teachers will give classes on the state of the art of the selected topics and the students will be requested to prepare specific seminars. At

the end, there will be an evaluation based on their performance in the seminars (content and didactics) and their participation in the discussions.

Type of Assessment:

Performance in the presentation and the content of seminars Assiduity Participation in discussions.

Notes/Remarks:

Minimum number of students: 5 Maximum number of students: 10

Bibliography:

Josephson ME. Clinical Cardiac Electrophysiology. 3rd ed. Philadelphia: Lippincott Williams & Wilkins; 2002: 812–830.

De Vreede-Swagemakers JJ, Gorgels AP, Dubois-Arbouw WJ, et al. Out-of-hospital cardiac arrest in the 1990's: a population based study in the Maastricht area on incidence, characteristics and survival. J Am Coll Cardiol. 1997; 30: 1500–1505.

Waalewijn RA, de Vos R, Koster RW. Out-of-hospital cardiac arrests in Amsterdam and its surrounding areas: results from the Amsterdam resuscitation study (ARREST) in 'Utstein' style. Resuscitation. 1998;38(3):157-67

Jouven X, Desnos M, Guerot C, et al. Predicting sudden death in the population: the Paris prospective study I. Circulation. 1999; 99: 1978–1983.

Zhi-Jie Z, Croft JB, Giles WH, et al. Sudden cardiac death in the United States, 1989 to 1998. Circulation. 2001; 104: 2158–2163.

Myerburg RJ, Castellanos A. Cardiac arrest and sudden cardiac death. In: Braunwald E, Zipes DP, Libby P, eds. Heart Disease: A Textbook of Cardiovascular Medicine. 6th ed. Philadelphia: WB Saunders: 2001: 890–931.

Spooner PM, Albert C, Benjamin EJ, et al. Sudden cardiac death, genes and arrhythmogenesis: consideration of new population and mechanistic approaches from a National Heart, Lung and Blood Institute workshop, part I. Circulation. 2001; 103: 2361–2364.

Spooner PM, Albert C, Benjamin EJ, et al. Sudden cardiac death, genes and arrhythmogenesis: consideration of new population and mechanistic approaches from a National Heart, Lung and Blood Institute workshop, part II. Circulation. 2001; 103: 2447–2452.

Eisenberg MS, Mengert TJ. Cardiac resuscitation. N Engl J Med. 2001; 344: 1304–1313. Becker LB, Weisfeldt ML, Weil MH, et al. The PULSE initiative: scientific priorities and strategic planning for resuscitation research and life saving therapies. Circulation. 2002; 105: 2562–2570.

Wellens HJJ, Gorgels AP, De Munter H. Cardiac arrest outside of a hospital: how can we improve results of resuscitation? Circulation. 2003; 107: 1948–1950.

Pires LA, Lehmann MH, Buxton AE, et al. Differences in inducibility and prognosis of inhospital versus out-of-hospital identified non sustained ventricular tachycardia in patients with coronary artery disease: clinical and trial design implications. J Am Coll Cardiol. 2001; 38: 1156–1162.

Thomas KE, Josephson ME. The role of electrophysiology study in risk stratification of sudden cardiac death. Prog Cardiovasc Dis. 2008;51(2):97-105.

Bailey JJ, Berson AS, Handelsman H, et al. Utility of current risk stratification tests for predicting major arrhythmic events after myocardial infarction. J Am Coll Cardiol. 2001; 38: 1902–1911.

Beta-Blocker Heart Attack Trial Research Group. A randomized trial of propranolol in patients with acute myocardial infarction, I: mortality results. JAMA. 1982; 247: 1707–1714. Chadda K, Goldstein S, Byington R, et al. Effect of propanolol after acute myocardial infarction in patients with congestive heart failure. Circulation. 1986; 73: 503–510. Kendall MJ, Lynch KP, Hjalmarson, et al. Beta blockers and sudden cardiac death. Ann Intern Med. 1995; 123: 358–367.

Echt DS, Liebson PR, Mitchell LB, et al. Mortality and morbidity in patients receiving encainide, flecainide, or placebo: the Cardiac Arrhythmia Suppression Trial. N Engl J Med. 1991; 324: 781–788.

Doval HC, Nul DR, Grancelli HO, et al. Randomized trial of low dose amiodarone in severe

congestive heart failure: Grupo de Estudio de la Sobrevida en la Insuficiencia Cardiaca en Argentina (GESICA). Lancet. 1994; 344: 493–498.

Julian DG, Camm AJ, Frangin G, et al. Randomised trial of effect of amiodarone on mortality in patients with left-ventricular dysfunction after recent myocardial infarction: EMIAT.

European Myocardial Infarct Amiodarone Trial Investigators. Lancet. 1997; 349: 667–674. Boutitie F, Boissel JP, Connolly SJ, et al. Amiodarone interaction with beta-blockers: analysis of the merged EMIAT (European Myocardial Infarct Amiodarone Trial) and CAMIAT (Canadian Amiodarone Myocardial Infarction Trial) databases. The EMIAT and CAMIAT Investigators. Circulation. 1999; 99: 2268–75.

Hine L, Laird N, Hewitt P, et al. Meta-analysis of empirical long-term antiarrhythmic therapy after myocardial infarction. JAMA. 1989; 262: 3037–3040.

Cardiac Arrest in Seattle: Conventional Versus Amiodarone Drug Evaluation (the CASCADE study). Am J Cardiol. 1991 Mar 15;67(7):578-84.

Greene HL. The CASCADE Study: randomized antiarrhythmic drug therapy in survivors of cardiac arrest in Seattle. CASCADE Investigators. Am J Cardiol. 1993;72(16):70F-74F. Anderson JL. Contemporary clinical trials in ventricular tachycardia and fibrillation: implications of ESVEM, CASCADE, and CASH for clinical management. J Cardiovasc Electrophysiol. 1995;6:880-6.

Lau EW, Griffith MJ, Pathmanathan RK, et al. The Midlands Trial of Empirical Amiodarone versus Electrophysiology-guided Interventions and Implantable Cardioverter-defibrillators (MAVERIC): a multi-centre prospective randomised clinical trial on the secondary prevention of sudden cardiac death. Europace. 2004;6(4):257-66.

Domanski MJ, Exner DV, Borkowf CB, et al. Effect of angiotensin converting enzyme inhibition on sudden death in patients following acute myocardial infarction: a meta-analysis of randomized clinical trials. J Am Coll Cardiol. 1999; 33: 598–604.

Pitt B, Remme W, Zannad F, et al, for the Eplerenone Post-Acute Myocardial Infarction Heart Failure Efficacy and Survival Study Investigators. Eplerenone, a selective aldosterone blocker, in patients with left ventricular dysfunction after myocardial infarction. N Engl J Med. 2003; 348: 1309–1321.

Leaf A, Kang JX, Xiao YF, Billman GE. Clinical prevention of sudden cardiac death by n-3 polyunsaturated fatty acids and mechanism of prevention of arrhythmias by n-3 fish oils. Circulation. 2003;107(21):2646-52.

Guiraudon G, Fontaine G, Frank R, et al. Encircling endocardial ventriculotomy: a new surgical treatment for life-threatening ventricular tachycardias resistant to medical treatment following myocardial infarction. Ann Thorac Surg. 1978; 26: 438–444.

Josephson ME, Harken AH, Horowitz LN. Endocardial excision: a new surgical technique for the treatment of recurrent ventricular tachycardia. Circulation. 1979; 60: 1430–1439. Sosa E, Scanavacca M, d'Avila A, et al. Long-term results of visually guided left ventricular

reconstruction as single therapy to treat ventricular tachycardia associated with postinfarction anteroseptal aneurysm. J Cardiovasc Electrophysiol. 1998;9(11):1133-43.

Sosa E, Scanavacca M, d'Avila A, Pilleggi F. A new technique to perform epicardial mapping in the electrophysiology laboratory. J Cardiovasc Electrophysiol. 1996;7(6):531-6.

Reddy VY, Reynolds MR, Neuzil P, et al. Prophylactic catheter ablation for the prevention of defibrillator therapy. N Engl J Med. 2007;357(26):2657-65.

Stevenson WG, Wilber DJ, Natale A, et al. Irrigated radiofrequency catheter ablation guided by electroanatomic mapping for recurrent ventricular tachycardia after myocardial infarction: the multicenter thermocool ventricular tachycardia ablation trial. Circulation. 2008;118(25):2773-82

Kuck KH, Schaumann A, Eckardt L, et al. Catheter ablation of stable ventricular tachycardia before defibrillator implantation in patients with coronary heart disease (VTACH): a multicentre randomised controlled trial. Lancet. 2010;375(9708):31-40.

Sacher F, Roberts-Thomson K, Maury P, et al. Epicardial ventricular tachycardia ablation a multicenter safety study. J Am Coll Cardiol. 2010;55(21):2366-72.

Mirowski M, Reid PR, Watkins L, et al. Clinical treatment of life-threatening ventricular tachyarrhythmias with the automatic implantable defibrillator. Am Heart J. 1981; 102: 265–270.

The Antiarrhythmics Versus Implantable Defibrillators (AVID) Investigators. A comparison of antiarrhythmic-drug therapy with implantable defibrillators in patients resuscitated from near-fatal ventricular arrhythmias. N Engl J Med. 1997; 337: 1576–1584.

Moss AJ, Hall WJ, Cannom DS, et al. Improved survival with an implanted defibrillator in patients with coronary artery disease at high risk for ventricular arrhythmia. N Engl J Med. 1996; 335: 1933–1940.

Bigger JT Jr; Coronary Artery Bypass Graft (CABG) Patch Trial Investigators. Prophylactic use of implanted cardiac defibrillators in patients at high risk for ventricular arrhythmias after

coronary-artery bypass graft surgery. N Engl J Med 1997;337:1569-75

Buxton AE, Lee KL, Fisher JD, et al. A randomized study of the prevention of sudden death in patients with coronary artery disease. N Engl J Med. 1999; 341: 1882–1890.

Connolly SJ, Gent M, Roberts RS, et al. Canadian implantable defibrillator study (CIDS): a randomized trial of the implantable cardioverter defibrillator against amiodarone. Circulation. 2000; 101: 1297–1302.

Moss AJ, Zareba W, Hall WJ, et al, for the Multicenter Automatic Defibrillator Implantation Trial II Investigators. Prophylactic implantation of a defibrillator in patients with myocardial infarction and reduced ejection fraction. N Engl J Med. 2002; 346: 877–883.

Reynolds MR, Josephson ME. MADIT II (second Multicenter Automated Defibrillator Implantation Trial) debate: risk stratification, costs, and public policy. Circulation. 2003; 108: 1779–1783.

Young JB, Abraham WT, Smith AL, et al, for the Multicenter InSync ICD Randomized Clinical Evaluation (MIRACLE ICD) Trial Investigators. Combined cardiac resynchronization and implantable cardioversion defibrillation in advanced chronic heart failure: the MIRACLE ICD trial. JAMA. 2003; 289: 2685–2694.

Salukhe TV, Francis DP, Sutton R. Comparison of medical therapy, pacing and defibrillation in heart failure (COMPANION) trial terminated early; combined biventricular pacemaker-defibrillators reduce all-cause mortality and hospitalization. Int J Cardiol. 2003; 87: 119–120.

Hohnloser SH, Kuck KH, Dorian P, et al.; DINAMIT Investigators. Prophylactic use of an implantable cardioverter-defibrillator after acute myocardial infarction. N Engl J Med 2004;351:2481-8.

Nanthakumar K, Epstein AE, Kay GN, et al. Prophylactic implantable cardioverter-defibrillator therapy in patients with left ventricular systolic dysfunction: a pooled analysis of 10 primary prevention trials. J Am Coll Cardiol 2004;44: 2166-72.

Bardy GH, Lee KL, Mark DB, et al.; Sudden Cardiac Death in Heart Failure Trial. (SCD-HeFT) Investigators. Amiodarone or an implantable cardioverter-defibrillator for congestive heart failure. N Engl J Med 2005;352:225-37.

Goldenberg I, Moss AJ, Hall WJ, et al. Causes and consequences of heart failure after prophylactic implantation of a defibrillator in the multicenter automatic defibrillator implantation trial II. Circulation. 2006;113(24):2810-7.

Connolly SJ, Dorian P, Roberts RS, et al. Comparison of beta-blockers, amiodarone plus beta-blockers, or sotalol for prevention of shocks from implantable cardioverter defibrillators: the OPTIC Study: a randomized trial.JAMA. 2006 Jan 11;295(2):165-71.

Maron BJ, Spirito P, Shen WK, et al. Implantable Cardioverter-Defibrillators and Prevention of Sudden Cardiac Death in Hypertrophic Cardiomyopathy. JAMA. 2007; 298:405-412. Goldenberg I, Vyas AK, Hall WJ, et al. Risk stratification for primary implantation of a cardioverter-defibrillator in patients with ischemic left ventricular dysfunction. J Am Coll Cardiol. 2008;51(3):288-96.

Packer DL, Prutkin JM, Hellkamp AS, et al. Impact of implantable cardioverter-defibrillator, amiodarone, and placebo on the mode of death in stable patients with heart failure: analysis from the sudden cardiac death in heart failure trial. Circulation. 2009;120(22):2170-6. Ip J, Waldo AL, Lip GY, et al. Multicenter randomized study of anticoagulation guided by remote rhythm monitoring in patients with implantable cardioverter-defibrillator and CRT-D devices: Rationale, design, and clinical characteristics of the initially enrolled cohort The

IMPACT study. Am Heart J. 2009 Sep;158(3):364-370 e1. Probst V, Veltmann C, Eckardt L, et al. Long-term prognosis of patients diagnosed with Brugada syndrome: Results from the FINGER Brugada Syndrome Registry. Circulation. 2010;121(5):635-43.

Mark DB, Anstrom KJ, McNulty SE, et al. Quality of life effects of automatic external defibrillators in the home: results from the Home Automatic External Defibrillator Trial (HAT). Am Heart J. 2010;159(4):627-634.

Benjamin EJ, Levy D, Vasiri SM, D'Agostino RB, Belanger AJ, Wolf PA. Independent risk factors for atrial fibrillation in a population-based cohort: the Framingham Heart Study. JAMA 1994; 271:840-4.

Benjamin EJ, Wolf PA, D'Agostino RB, et al. Impact of atrial fibrillation on the risk of death: the Framingham Heart Study. Circulation. 1998;98:946-952.

Shiroshita-Takeshita A, Brundel BJ, Nattel S. Atrial fibrillation: basic mechanisms, remodeling and triggers. J Interv Card Electrophysiol 2005;13:181-193.

Allessie M, Ausma J, Schotten U. Electrical, contractile and structural remodeling during atrial fibrillation. Cardiovasc Res 2002;54:230-246.

Nattel S. New ideas about atrial fibrillation 50 years on. Nature 2002;415:219-226.

Wolf PA, Dawber TR, Thomas HE Jr, et al. Epidemiologic assessment of chronic atrial fibrillation and risk of stroke: the Framingham study. Neurology. 1978;28:973-977.

Risk factors for stroke and efficacy of antithrombotic therapy in atrial fibrillation: analysis of pooled data from five randomized controlled trials. Arch Intern Med. 1994;154:1449-1457.

Crijns HJ, Tjeerdsma G, de Kam PJ, Boomsma F, van Gelder IC, van den Berg MP. Prognostic value of the presence of atrial fibrillation in patients with advanced chronic heart failure. Eur Heart J 2000; 21:1238-45.

Haissaguerre M, Jais P, Shah DC, et al. Spontaneous initiation of atrial fibrillation by ectopic beats originating in the pulmonary veins. N Engl J Med 1998;339:659-666.

Cox JL, Canavan TE, Schuessler RB,et al. The surgical treatment of atrial fibrillation. II. Intraoperative electrophysiologic mapping and description of the electrophysiologic basis of atrial flutter and atrial fibrillation. J Thorac Cardiovasc Surg 1991;101:406-426. Abreu Filho CA, Lisboa LA, Dallan LA, , et. al. Effectiveness of the maze procedure using cooled-tip radiofrequency ablation in patients with permanent atrial fibrillation and rheumatic mitral valve disease. Circulation 2005; 112(9 Suppl); I20-5. Roy D, Talajic M, Dorian P, et al. Amiodarone to prevent recurrence of atrial fibrillation. Canadian Trial of Atrial Fibrillation Investigators. N Engl J Med. 2000;342(13):913-20.

Klein AL, Grimm RA, Murray RD, et al. Use of transesophageal echocardiography to guide cardioversion in patients with atrial fibrillation. Assessment of Cardioversion Using Transesophageal Echocardiography Investigators. N Engl J Med.2001;344(19):1411-20

Wyse DG, Waldo AL, DiMarco JP, et al. A comparison of rate control and rhythm control in patients with atrial fibrillation. N Engl J Med 2002;347:1825-1833.

Corley SD, Epstein AE, DiMarco JP, et al. Relationships between sinus rhythm, treatment, and survival in the Atrial Fibrillation Follow-Up Investigation of Rhythm Management (AFFIRM) Study. Circulation 2004;109:1509-1513.

Go AS, Hylek EM, Chang Y, et al. Anticoagulation therapy for stroke prevention in atrial fibrillation: how well do randomized trials translate into clinical practice. JAMA. 2003;290(20):2685-92.

Alboni P, Botto GL, Baldi N, et al. Outpatient treatment of recent-onset atrial fibrillation with the "pill-in-the-pocket" approach. N Engl J Med. 2004;351(23):2384-91.

Singh BN, Singh SN, Reda DJ, et al; Sotalol Amiodarone Atrial Fibrillation Efficacy Trial (SAFE-T) Investigators. Amiodarone versus sotalol for atrial fibrillation. N Engl J Med. 2005;352(18):1861-72.

Anand K, Mooss AN, Hee TT. Meta-analysis: inhibition of renin-angiotensin system prevents new-onset atrial fibrillation. Am Heart J 2006; 152:217-22.

Scanavacca MI, Sosa E. Catheter ablation of atrial fibrillation: techniques and results. Arq Bras Cardiol. 2005;85(4):295-301.

Cappato R, Calkins H, Chen SA, et al. Worldwide survey on the methods, efficacy, and safety of catheter ablation for human atrial fibrillation. Circulation 2005;111:1100-1105.

Fenelon G, Scanavacca M, Atié J, et al. Atrial fibrillation ablation in Brazil: results of the registry of the Brazilian Society of Cardiac Arrhythmias. Arq Bras Cardiol. 2007;89(5):258-62, 285-9.

Jais P, Cauchemez B, MacLe L, et al. Atrial fibrillation ablation vs antiarrhythmic drugs: A

multicenter randomized trial. Heart Rhythm 2006;3 Suppl:S1-S460.

Pappone C, Augello G, Sala S, et al. A randomized trial of circumferential pulmonary vein ablation versus antiarrhythmic drug therapy in paroxysmal atrial fibrillation: the APAF Study. J Am Coll Cardiol 2006;48:2340-2347.

Scanavacca M, Pisani CF, Hachul D, et al. Selective atrial vagal denervation guided by evoked vagal reflex to treat patients with paroxysmal atrial fibrillation. Circulation 2006;114:876-885

Stabile G, Bertaglia E, Senatore G, et al. Catheter ablation treatment in patients with drugrefractory atrial fibrillation: a prospective, multi-centre, randomized, controlled study (Catheter Ablation For The Cure Of Atrial Fibrillation Study). Eur Heart J 2006;27:216-221.

Roy D, Talajic M, Nattel S, Wyse DG, Dorian P, Lee KL, et al. The Atrial Fibrillation and Congestive Heart Failure Investigators. Rhythm Control versus Rate Control for Atrial Fibrillation and Heart Failure. N Eng J Med 2008; 358:2227-2677.

Køber L, Torp-Pedersen C, McMurray JJ, for Dronedarone Study Group. Increased mortality after dronedarone therapy for severe heart failure. N Engl J Med. 2008; 358:2678-87 Hohnloser SH, Crijns HJGM, van Eickels M, Gaudin C, Page RL, Torp-Pedersen C, Connolly SJ, the ATHENA Investigators. Effect of dronedarone on cardiovascular events in atrial fibrillation. N Eng J Med 2009; 360:668-678.

Connolly SJ, Crijns HJ, Torp-Pedersen C, for ATHENA Investigators. Analysis of stroke in ATHENA: a placebo-controlled, double-blind, parallel-arm trial to assess the efficacy of dronedarone 400 mg BID for the prevention of cardiovascular hospitalization or death from any cause in patients with atrial fibrillation/atrial flutter. Circulation 2009; 120:1174-80. Khan MN, Jaïs P, Cummings J, Di Biase L, et al. PABA-CHF Investigators. Pulmonary-vein isolation for atrial fibrillation in patients with heart failure. N Engl J Med. 2008;359(17):1778-85.

Connolly SJ, Ezekowitz MD, Yusuf S, et al, RE-LY Steering Committee and Investigators. Dabigatran versus warfarin in patients with atrial fibrillation. N Engl J Med. 2009 ;361(12):1139-51.

Wilber DJ, Pappone C, Neuzil P, ThermoCool AF Trial Investigators. Comparison of antiarrhythmic drug therapy and radiofrequency catheter ablation in patients with paroxysmal atrial fibrillation: a randomized controlled trial. JAMA. 2010;303(4):333-40.

Talajic M, Khairy P, Levesque S, Connolly SJ, Dorian P, Dubuc M, et;al.; AF-CHF Investigators. Maintenance of sinus rhythm and survival in patients with heart failure and atrial fibrillation. J Am Coll Cardiol 2010; 55(17):1796-802.

Van Gelder IC, Groenveld HF, Crijns HJGM, Tuininga YS, Tijssen JGP, Alings AM, et.al. the RACE II Investigators. Lenient versus strict rate control in patients with atrial fibrillation. N Eng J Med 2010; 362:1363-1373.

January CT, Wann LS, Alpert JS, Calkins H, Cleveland JC, Cigarroa JE, Conti JB, Ellinor PT, Ezekowitz MD, Field ME, Murray KT, Sacco RL, Stevenson WG, Tchou PJ, Tracy CM, Yancy CW. 2014 AHA/ACC/HRS guideline for the management of patients with atrial fibrillation: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines and the Heart Rhythm Society. Circulation 2014;129:1-124.

Languages taught:

Portuguese