Discipline MCP5859
Imaging Methods In Cardiovascular Scientific Research

Concentration area: 5131

Creation: 16/05/2019

Activation: 16/05/2019

Credits: 2

Workload:

Theory (weekly)	Practice (weekly)	Study (weekly)	Duration	Total
9	9	12	1 weeks	30 hours

Professors:

Roberto Kalil Filho

Carlos Eduardo Rochitte

Pedro Alves Lemos Neto

Objectives:

OBJECTIVE: - To contribute to the training of researchers in the field of the use of imaging methods for the study of cardiovascular diseases; - Understand the concepts and applications of the main research methods in the area: Magnetic Resonance, Spectroscopy, Angiography of coronary, cardiac PET, perfusion scintigraphy, endovascular image (OCT, ultrasonography), coronary flow; - To know, discuss, analyze and elaborate potential applications and investigations involving new resources and imaging methods for the study of cardiovascular diseases.

Rationale:

RATIONALE: In the last decades, imaging methods have revolutionized diagnostic research and treatment in all areas of medicine. In the field of cardiovascular diseases, this development took place in a more remarkable way, with the participation of the imaging methodology in most of the outcomes of the main clinical studies, which has been tracing the modern guidelines for the treatment of these diseases. The rapid evolution of imaging techniques and their increasing application in scientific research has generated an important demand by researchers able to generate new knowledge, methods, devices (including patents) and applications, from the information obtained by the imaging methods used in the study of diseases cardiovascular diseases. There is a lack of training courses for this type of researcher.

Content:

CONTENT: - Choice and interpretation of variables and outcomes in studies involving Magnetic Nuclear Resonance (NMR) - Selection and interpretation of variables and outcomes in studies involving coronary angiotomography - Choice and interpretation of variables and outcomes in studies involving spectroscopy - Choice and interpretation of variables and outcomes in studies involving endovascular imaging (OCT, ultrasonography, coronary flow) - Selection and interpretation of variables and outcomes in studies involving cardiac PET - Selection and interpretation of variables and outcomes in studies involving perfusion scintigraphy - New technologies and new methods in the study of atherothrombogenesis.

Type of Assessment:

See observation field

Notes/Remarks:

EVALUATION: - Frequency, use and participation during classes and discussions (responsible teachers encourage and are present in all classes) - Written test - Realization of a research project including bibliographic review on the topic. NOTE: Minimum number of students: Three Maximum number of students: Twenty

Bibliography:

1. Greenland P, Smith SC, Grundy SM. Improving coronary heart disease risk assessment in asymptomatic people: role of traditional risk factors and noninvasive cardiovascular tests. Circulation. 2001;104(15):1863-7. 2. Mark DB, Berman DS, Budoff MJ, Carr JJ, Gerber TC, Hecht HS, et al. ACCF/ACR/AHA/NASCI/SAIP/SCAI/SCCT 2010 expert consensus document on coronary computed tomographic angiography: a report of the American College of Cardiology Foundation Task Force on Expert Consensus Documents. J Am Coll Cardiol. 2010;55(23):2663-99. 3. Taylor AJ, Cerqueira M, Hodgson JM, Mark D, Min J, O'Gara P, et al. ACCF/SCCT/ACR/AHA/ASE/ASNC/NASCI/SCAI/SCMR 2010 appropriate use criteria for cardiac computed tomography: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, the Society of Cardiovascular Computed Tomography, the American College of Radiology, the American Heart Association, the American Society of Echocardiography, the American Society of Nuclear Cardiology, the North American Society for Cardiovascular Imaging, the Society for Cardiovascular Angiography and Interventions, and the Society for Cardiovascular Magnetic Resonance. J Am Coll Cardiol. 2010;56(22):1864-94. 4. Monteiro VS, Lacerda HR, Uellendahl M, Chang TM, Albuquerque VM, Zirpoli JC, et al. Calcium score in the evaluation of atherosclerosis in patients with HIV/Aids. Arq Bras Cardiol. 2011;97(5):427-33. 5. Budoff MJ, Achenbach S, Blumenthal RS, Carr JJ, Goldin JG, Greenland P, et al. Assessment of coronary artery disease by cardiac computed tomography: a scientific statement from the American Heart Association Committee on Cardiovascular Imaging and Intervention, Council on Cardiovascular Radiology and Intervention, and Committee on Cardiac Imaging, Council on Clinical Cardiology. Circulation. 2006;114(16):1761-91. 6. Gottlieb I, Miller JM, Arbab-Zadeh A, Dewey M, Clouse ME, Sara L, et al. The absence of coronary calcification does not exclude obstructive coronary artery disease or the need for revascularization in patients referred for conventional coronary angiography. J Am Coll Cardiol. 2010;55(7):627-34. 7. Park R, Detrano R, Xiang M, Fu P, Ibrahim Y, LaBree L, et al. Combined use of computed tomography coronary calcium scores and C-reactive protein levels in predicting cardiovascular events in nondiabetic individuals. Circulation. 2002;106(16):2073-7. 8. Kalia NK, Miller LG, Nasir K, Blumenthal RS, Agrawal N, Budoff MJ. Visualizing coronary calcium is associated with improvements in adherence to statin therapy. Atherosclerosis. 2006;185(2):394-9. 9. Taylor AJ, Bindeman J, Feuerstein I, Le T, Bauer K, Byrd C, et al. Community-based provision of statin and aspirin after the detection of coronary artery calcium within a community-based screening cohort. J Am Coll Cardiol. 2008;51(14):1337-41. 10. Budoff MJ, Dowe D, Jollis JG, Gitter M, Sutherland J, Halamert E, et al. Diagnostic performance of 64-multidetector row coronary computed tomographic angiography for evaluation of coronary artery stenosis in individuals without known coronary artery disease: results from the prospective multicenter ACCURACY (Assessment by Coronary Computed Tomographic Angiography of Individuals Undergoing Invasive Coronary Angiography) trial. J Am Coll Cardiol. 2008;52(21):1724-32. 11. Miller J, Rochitte C, Dewey M, Arbab-Zadeh A, Niinuma H, Gottlieb I, et al. Diagnostic performance of coronary angiography by 64-Row CT. N Engl J Med. 2008;359(22):2324-36. 12. Meijboom WB, Meijs MF, Schuijf JD, Cramer MJ, Mollet NR, van Mieghem CA, et al. Diagnostic accuracy of 64-slice computed tomography coronary angiography: a prospective, multicenter, multivendor study. J Am Coll Cardiol. 2008;52(25):2135-44. 13. Azevedo Filho CF, Hadlich M, Petriz JL, Mendonça LA, Moll Filho JN, Rochitte CE. Quantification of left ventricular infarcted mass on cardiac magnetic resonance imaging: comparison between planimetry and the semiquantitative visual scoring method. Arq Bras Cardiol. 2004;83(2):118-24; 111-7. 14. Nigri M, Azevedo CF, Rochitte CE, Schraibman V, Tarasoutchi F, Pommerantzeff PM, et al. Contrast-enhanced magnetic resonance imaging identifies focal regions of intramyocardial fibrosis in patients with severe aortic valve disease: correlation with quantitative histopathology. Am Heart J. 2009;157(2):361-8. 15. Rosario MA, Lima JJ, Parga JR, Avila LF, Gowdak LH, Lemos PA, et al. [Coronary calcium score as predictor of stenosis and events in pretransplant renal chronic failure]. Arq Bras Cardiol. 2010;94(2):236-43, 252-60, 239-47. 16. Hadamitzky M, Distler R, Meyer T, Hein F, Kastrati A, Martinoff S, et al. Prognostic value of coronary computed tomographic angiography in comparison with calcium scoring and clinical risk scores. Circ Cardiovasc Imaging. 2011;4(1):16-23. 17. Azevedo CF, Cheng S, Lima JA. Cardiac imaging to identify patients at risk for developing heart failure after myocardial infarction. Curr Heart Fail Rep. 2005;2(4):183-8. 18. Pundziute G, Schuijf JD, Jukema JW, Boersma E, de Roos A, van der Wall EE, et al. Prognostic value of multislice computed tomography coronary angiography in patients with known or suspected coronary artery disease. J Am Coll Cardiol. 2007;49(1):62-70.

Languages taught:

Portuguese