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Santa Maria
della Misericordia
di Udine

**Dipartimento di Diagnostica per Immagini
S.O.C. di Fisica Sanitaria**

Dr. Renato Padovani

Director of Medical Physics Institute

University Hospital S. Maria della Misericordia

Udine, Italy

Education

- a. PhD in Physics at the Trieste University in 1972
- b. Medical physicist
- c. Qualified expert in radiation protection
- d. Medical physics expert

Profession

- a. Assistant Medical physicists at the Udine hospital since 1977
- b. Director of the Regional Laboratory for Environmental Radioactivity from 1986 to 2000.
- c. Director of the Medical Physics Institute of the Udine University Hospital since 1986.
- d. Deputy Director of the Diagnostic Imaging Department.
- e. Teaching activity:
 - Faculty of Medicine of Udine University: medical physics and radiation protection in the specialisation course for radiologists, BSC degree for radiographers; training for medical physics residents
 - Padua University: quality assurance at the Medical physics school of the Faculty of Medicine; on the job training of medical physics residents
 - Several IAEA training activities in Italy and in several countries.
 - Professor since 2008 at the ESI/EFOMP School of Medical Physics (Archamps, Fr)
- f. Professional activity as medical physicists in the field of:
 - Diagnostic radiology: optimisation in radiology, digital radiology and interventional radiology, dosimetry, MR technology
 - Radiation protection: staff and patient dosimetry, planning and structural design of all kind of medical installations
 - Radiotherapy: dosimetry, treatment planning with linacs and brachytherapy
 - Nuclear medicine: quality assurance, dosimetry and quality control with all type of equipment including hybrid systems (pet-ct and spect/ct) and isotope production
 - Radiation protection: staff and patient dosimetry,.



**Dipartimento di Diagnostica per Immagini
S.O.C. di Fisica Sanitaria**

Research

- a. Several European projects (Euratom FPs: Dimond II, III and, in the FP 6, Sentinel projects, EMAN, DATA MED, MEDRAPET). The SENTINEL project included the collaboration with 21 European countries in the field of optimisation of digital technologies in diagnostic and interventional radiology practice, including patients and staff radiation protection. Presently partner of the EMAN project and leader of the WG 3 on optimisation in radiological practices performed outside the radiology department.
- b. Participation to CRP IAEA projects in the field of patient and staff exposure in diagnostic and interventional radiology. Since 2009, in the ISEMIR project leading the WG on staff exposure in interventional cardiology aiming to develop an international database. Since 2010, leading the WG 5 & 6 of the IAEA CRP project on the development of dosimetry methodologies for diagnostic and interventional radiology.
- c. National projects in the assessment of DRLs, dosimetry and quality assurance in diagnostic and interventional radiology. Presently, WG leader in the AGENAS-ISS project aiming to optimise exposures and technology in interventional radiology practices.

With regards to the affiliation to scientific societies:

- a. Member of the Council from 1995 to 1999 and President from 1999 to 2001 of the Medical Physics Section of the Italian Society of Radiology (SIRM)
- b. Member and Co-founder of the Italian Society of Medical Physics (AIFM) and vice-President from 2001 to 2003.
- c. Member of the Italian Society of Radiation Protection (AIRP)
- d. Affiliated member of EAR (European Association of Radiology)
- e. Secretary General of EFOMP (European Federation of Organisations for Medical Physics) 2006-2011
- f. Vice-Chair of the European Union Matters Committee of EFOMP (European Federation of Organisations for Medical Physics) 2012
- g. Chair for 2013-2014 of the European Union Matters Committee of EFOMP (European Federation of Organisations for Medical Physics).



**Dipartimento di Diagnostica per Immagini
S.O.C. di Fisica Sanitaria**

Publications and conference presentations (from 2004)

1. Tsapaki V, Kottou S, Vano E, Komppa T, Padovani R, Dowling A, Molfetas M, Neofotistou V. Occupational dose constraints in interventional cardiology procedures: the DIMOND approach. *Phys Med Biol.* 2004 Mar 21;49(6):997-1005.
2. Congresso, ECR 2004: Follow up of patients for skin injuries in interventional cardiology; Vienna, March 2004
3. Congresso ECR 2004: Complexity index in interventional cardiology; Vienna, March 2004
4. Padovani R. The importance of education and training in reducing patient doses, E3 Syllabus, Radiation Protection, ECR 2004
5. R. Padovani, S. Brusaferrò, Sicurezza di operatori e pazienti e nuove tecnologie d'immagine, 2° Convegno Nazionale di Organizzazione, Igiene e Tecnica Ospedaliera, Grado, aprile 2004I nuovi Ospedali
6. IAEA Course for trainers in interventional cardiology, Vienna, 6-7 May 2004-04-14
7. SIRM 2004: gestione dose e qualità per i sistemi CR; maggio 2004; relazione ad invito
8. SIRM 2004: dose e qualità nei sistemi MSCT; maggio 2004; relazione ad invito
9. Vano E, Back C, Beissel J, Bernardi G, Padovani G, Training in radiological protection for interventional cardiologists. Initial European experience. IRPA Madrid, 2004
10. Padovani R, Several lecturers on radiation protection in radiology and interventional radiology; A week course for radiologists; IAEA; 2005, Karachi (Pakistan)
11. Padovani R, Several lecturers on radiation protection in radiology and interventional radiology; A week course for radiologists; IAEA; April 2005, Abuja (Nigeria)
12. Padovani R., Staff exposure in interventional cardiology; Training course of radiation protection for cardiologists; IAEA; December 2005; Bangkok (Thailand)
13. V. Tsapaki, S. Kottou, E. Vano, T. Parviainen, R. Padovani, A. Dowling, M. Molfetas, and V. Neofotistou, Correlation of patient and staff doses in interventional cardiology, *Radiation Protection Dosimetry Advance Access published on February 3, 2006, Radiat Prot Dosimetry 2005 117: 26-29; doi:10.1093/rpd/nci705*
14. Peterzol, R. Padovani, E. Quai, E. Vano, C. Prieto, and P. Aviles, The application of image quality measurements for digital angiography, *Radiation Protection Dosimetry Advance Access published on February 3, 2006, Radiat Prot Dosimetry 2005 117: 38-43; doi:10.1093/rpd/nci709*
15. Peterzol, E. Quai, R. Padovani, G. Bernardi, C. J. Kotre, and A. Bowling, Reference levels in PTCA as a function of procedure complexity, *Radiation Protection Dosimetry Advance Access published on February 3, 2006, Radiat Prot Dosimetry 2005 117: 54-58; doi:10.1093/rpd/nci719*
16. Trianni, G. Bernardi, and R. Padovani, Are new technologies always reducing patient doses in cardiac procedures? *Radiation Protection Dosimetry Advance Access published on February 3, 2006, Radiat Prot Dosimetry 2005 117: 97-101; doi:10.1093/rpd/nci747*
17. G. Bernardi, R. Padovani, L. Spedicato, W. Desmet, M. R. Malisan, J. D. Giannuleas, E. Neofotistou, A. Manginas, Z. Olivari, J. Cosgrave, F. Alfonso, H. Bosmans, A. Dowling, and E. Vano, Image quality criteria in cardiology, *Radiation Protection Dosimetry Advance Access published on February 3, 2006, Radiat Prot Dosimetry 2005 117: 102-106; doi:10.1093/rpd/nci750*
18. Trianni, R. Padovani, C. Foti, E. Cragnolini, G. Chizzola, H. Toh, G. Bernardi, and A. Proclemer, Dose to cardiologists in haemodynamic and electrophysiology cardiac interventional procedures, *Radiation Protection Dosimetry Advance Access published on February 3, 2006, Radiat Prot Dosimetry 2005 117: 111-115; doi:10.1093/rpd/nci764*
19. E. Vano, R. Padovani, G. Bernardi, J. I. Ten, A. Peterzol, A. Dowling, H. Bosmans, S. Kottou, Z. Olivari, K. Faulkner, and S. Balter, On the use of DICOM cine header information for optimisation: results from the 2002 European, DIMOND cardiology survey, *Radiation Protection Dosimetry Advance Access published on February 3, 2006, Radiat Prot Dosimetry 2005 117: 162-165; doi:10.1093/rpd/nci735*
20. R. Padovani and E. Quai, Patient dosimetry approaches in interventional cardiology and literature dose data review *Radiation Protection Dosimetry Advance Access published on February 3, 2006, Radiat Prot Dosimetry 2005 117: 217-221; doi:10.1093/rpd/nci751*



**Dipartimento di Diagnostica per Immagini
S.O.C. di Fisica Sanitaria**

21. O. Dragusin, W. Desmet, H. Heidbuchel, R. Padovani, and H. Bosmans , Radiation dose levels during interventional cardiology procedures in a tertiary care hospital , Radiation Protection Dosimetry Advance Access published on February 3, 2006 , Radiat Prot Dosimetry 2005 117: 231-235; doi:10.1093/rpd/nci754
22. Trianni, G. Chizzola, H. Toh, E. Quai, E. Cragolini, G. Bernardi, A. Proclemer, and R. Padovani , Patient skin dosimetry in haemodynamic and electrophysiology interventional cardiology , Radiation Protection Dosimetry, Advance Access published on February 3, 2006 , Radiat Prot Dosimetry 2005 117: 241-246; doi:10.1093/rpd/nci756
23. R. Padovani, G. Bernardi, E. Quai, M. Signor, H. S. Toh, G. Morocutti, and L. Spedicato , Retrospective evaluation of occurrence of skin injuries in interventional cardiac procedures , Radiation Protection Dosimetry Advance Access published on February 3, 2006 , Radiat Prot Dosimetry 2005 117: 247-250; doi:10.1093/rpd/nci757
24. G. Bernardi, R. Padovani, W. Desmet, A. Peterzol, J. D. Giannuleas, E. Neofotistou, A. Manginas, Z. Olivari, J. Cosgrave, F. Alfonso, J. Garcia, H. Bosmans, A. Dowling, H. S. Toh, G. Morocutti, and E. Vano , A Study to validate the method based on DIMOND quality criteria for cardiac angiographic images , Radiation Protection Dosimetry Advance Access published on February 3, 2006 , Radiat Prot Dosimetry 2005 117: 263-268; doi:10.1093/rpd/nci704
25. Dragusin O, Desmet W, Heidbuchel H, Padovani R, Bosmans H. Radiation dose levels during interventional cardiology procedures in a tertiary care hospital. Radiat Prot Dosimetry. 2005;117(1-3):231-5.
26. S Balter, DL Miller, E Vano, P Ortiz Lopez, G Bernardi, E Cotel, K Faulkner, R Nowotny, R Padovani, A Ramirez, A pilot study exploring the possibility of establishing guidance levels in x-ray directed interventional procedures, Medical Physics, 2007 ...
27. Bernardi G, Padovani R, Trianni A, Morocutti G, Spedicato L, Zanuttini D, Werren M, Wagner LK. The effect of fellows' training in invasive cardiology on radiological exposure of patients. Radiat Prot Dosimetry. 2007 Jun 15; PMID: 17573367
28. Tsapaki V, Padovani R, Vano E, Schreiner A, Molfetas M, Neofotistou V, Kottou , S. Commissioning and constancy protocols for digital angiographic units. Radiat Prot Dosimetry. 2005 Feb 2; PMID: 18245790
29. Bernardi G, Bar O, Jezewski T, Vano E, Maccia C, Trianni A, Padovani R. Quality criteria for cardiac images: an update. Radiat Prot Dosimetry. 2008 Feb 18; PMID: 18283064
30. Muhogora WE, Devetti A, Padovani R, Msaki P, Bonutti F. Application of european protocol in the evaluation of contrast-to-noise ratio and mean glandular dose for two digital mammography systems. Radiat Prot Dosimetry. 2008 Feb 18; PMID: 18283065
31. Foti C, Padovani R, Trianni A, Bokou C, Christofides S, Corbett R, Kepler K, Korenová Z, Kosunen A, Malone J, Torbica P, Tsapaki V, Vano E, Vassileva J, Zdesar U. Staff dosimetry in interventional cardiology: survey on methods and level of exposure. Radiat Prot Dosimetry. 2008 Feb 20; PMID: 18287188
32. Vano E, Järvinen H, Kosunen A, Bly R, Malone J, Dowling A, Larkin A, Padovani, R, Bosmans H, Dragusin O, Jaschke W, Torbica P, Back C, Schreiner A, Bokou C, Kottou S, Tsapaki V, Jankowski J, Papierz S, Domienik J, Werduch A, Nikodemova D, Salat D, Kepler K, Bor MD, Vassileva J, Borisova R, Pellet S, Corbett RH. Patient dose in interventional radiology: a european survey. Radiat Prot Dosimetry. 2008 Feb 20; PMID: 18287189
33. Malisan MR, Padovani R, Faulkner K, Malone JF, Vaño E, Jankowski J, Kosunen A. Proposal for a patient database on cardiac interventional exposures for epidemiological studies. Radiat Prot Dosimetry. 2008 Feb 20; PMID: 18287190
34. Padovani R, Trianni A, Bokou C, Bosmans H, Jankowski J, Kottou S, Kepler K, Malone J, Tsapaki V, Salat D, Vano E, Vassileva J. SURVEY ON PERFORMANCE ASSESSMENT OF CARDIAC ANGIOGRAPHY SYSTEMS. Radiat Prot Dosimetry. 2008 Feb 29; PMID: 18310097
35. Faulkner K, Malone J, Vano E, Padovani R, Busch HP, Zoetelief JH, Bosmans H. The sentinel project., Radiat Prot Dosimetry. 2008 Feb 29; PMID: 18310611
36. Padovani R, Vano E, Trianni A, Bokou C, Bosmans H, Bor D, Jankowski J, Torbica P, Kepler K, Dowling A, Milu C, Tsapaki V, Salat D, Vassileva J, Faulkner K. Reference levels at european level for cardiac interventional procedures. Radiat Prot Dosimetry. 2008 Feb 29; PMID: 18310612
37. S. Balter, D. L. Miller, E. Vano, P. Ortiz Lopez, G. Bernardi, E. Cotel, K. Faulkner, R. Nowotny, R. Padovani, A. Ramirez, A pilot study exploring the possibility of establishing guidance levels in x-ray directed interventional procedures, Med. Phys. 35, 2, February 2008
38. F. Bonutti, P. Lepre, A. Cecotti, E. Cragolini, G. Ferretti, C. Foti, O. Geatti, MR. Malisan, E. Moretti, M. Rossi and Padovani R. , Y90-microspheres distribution in liver from SPECT/CT images. 16TH International Conference on Medical Physics, Dubai, 14-16 Aprile 2008



**Dipartimento di Diagnostica per Immagini
S.O.C. di Fisica Sanitaria**

39. M.R. Malisan, E. Moretti, C. Foti, A. Trianni and R. Padovani, Commissioning of VARIAN Enhanced Dynamic Wedge on an Oncentra Masterplan Treatment Planning System. 16TH International Conference on Medical Physics, Dubai, 14-16 Aprile 2008
40. "Results of 5-year Monitoring of Radiation Doses to Staff in a Nuclear Medicine Department". MR Malisan, A Badini, F Bonutti e R Padovani. 16TH International Conference on Medical Physics, Dubai, 14-16 Aprile 2008
41. E. Moretti, MR Malisan, K Frisano, R. Padovani, Charge recombination correction in the dosimetry by means ionization chambre of a high dose-per-pulse electron accelerator for Intraoperative Radiation Therapy (IORT), World Congress of Medical Physics and Biomedical Engineering, Munich 7-12 settembre 2009
42. Dogan Bor, Turan Olgar, Turkey Toklu, Ayca Caglan, Elif Onal, Renato Padovani, Patient doses and dosimetric evaluations in interventional cardiology, *Physica Medica* (2009) 25, 31e42
43. Donald L. Miller, Eliseo Vañó, Gabriel Bartal, Stephen Balter, Robert Dixon, Renato Padovani, Beth Schueler, John F. Cardella, and Thierry de Baère, Occupational Radiation Protection in Interventional Radiology: A Joint Guideline of the Cardiovascular and Interventional Radiology Society of Europe and the Society of Interventional Radiology, *Cardiovasc Intervent Radiol.* 2010 April; 33(2): 230–239.
44. C. Varatharaj, E. Moretti, R. Ravikumar, M.R. Malisan, S. Supe, R. Padovani. Implementation and validation of a commercial portal dosimetry software for intensity-modulated radiation therapy pre-treatment verification, *J. Med-Phys*, 35, 4, 189-96 (2010)
45. Trianni Annalisa, Gasparini Daniele, Padovani Renato, Trigger Levels to prevent tissue reaction in interventional radiology procedures, IRPA 2010, Helsinki, 2010
46. M. R. Malisan, A. Fadone, M. Duratti and R. Padovani, Results of an incident reporting system implemented in a medical physics department to detect errors in treatment planning, 4rd Austrian, Italian, Slovenian and Croatian Medical Physics Meeting, Ljubljana (Slovenia), Maggio 2010.
47. M. R. Malisan, C. Foti, E. Moretti, A. Negri, A. Magli and R. Padovani, Dosimetric and radiobiological evaluation of treatment planning for pelvic IMRT with hypo-fractionated SIB to prostate. 4rd Austrian, Italian, Slovenian and Croatian Medical Physics Meeting, Ljubljana (Slovenia), Maggio 2010.
48. John Le Heron, Renato Padovani, Ian Smith, Renate Czarwinski, Radiation protection of medical staff, *European Journal of Radiology xxx* (2010) xxx–xxx
49. M. Band, F. Bonutti, M. Maieron, R. Padovani, Preliminary experience for evaluation of scanner performance and scanner stability for MRI studies at 3T, 4th Eur. Conf. Med. Physics, Udine, 2010
50. M. Maieron, S. D'Agostini, M. Skrap, B. Tomasino, R. Padovani, Is SWI brain vessel change suitable for enhance functional activation cortical maps?, 4th Eur. Conf. Med. Physics, Udine, 2010
51. M. Maieron, S. D'Agostini, L. Weis, R. Padovani, Are the commercial tools embedded on MR-scanners suitable for fMRI analysis?, 4th Eur. Conf. Med. Physics, Udine, 2010
52. E. Moretti, A. Magli, G. Como, M. Band, F. Bonutti, M. Crespi, M. Maieron, G. Brondani, M. Bazzocchi, R. Padovani, The integration of MRI in the radiation treatment planning of localized prostate cancer, 4th Eur. Conf. Med. Physics, Udine, 2010
53. A. Trianni, D. Gasparini, R. Padovani, Assessment of trigger levels to prevent tissue reaction in interventional radiology procedure, Proceedings of International Symposium on Standards, Applications and Quality Assurance in Medical Radiation Dosimetry (IDOS), November 9-12, 2010 (Awarded as best EFOMP presentation of the conference)
54. R. Padovani, J. Le Heron, R. Cruz-Suarez, A. Duran, C. Lefauve, D.L. Miller, H.K. Sim, E. Vano, M. Rehani and R. Czarwinski, International project on individual monitoring and radiation exposure levels in interventional cardiology, *Radiation Protection Dosimetry* (2010), pp. 1–5
55. Wilbrod Muhogora, Renato Padovani, Peter Msaki, Initial quality performance results using a phantom to simulate chest computed radiography, *Journal of Medical Physics*, Vol. 36, No. 1, 2011
56. Wilbrod Muhogora, Renato Padovani, Faustino Bonutti, Peter Msaki, R. Kazema, Performance evaluation of three computed radiography systems using methods recommended in American Association of Physicists in Medicine Report 93, *Journal of Medical Physics*, Vol. 36, No. 3, 2011-46
57. A. Magli, E. Moretti, M. Polsinelli, T. Ceschia, M. Signor, O. Geatti, R. Padovani, S. Fongione, FDG PPET/CT nella delineaazione dei volumi bersaglio in pazienti con carcinoma orofaringeo a cellule squamose localmente avanzato sottoposti



Dipartimento di Diagnostica per Immagini S.O.C. di Fisica Sanitaria

- a radioterapia a modulazione di intensità con frazionamento ipofrazionato accelerato e boost simultaneo e chemioterapia concomitante: risultati preliminari, AIRO 2011
58. A. Magli, E. Moretti, G. Brondani, G. Como, R. Padovani, S. Fongione, Risonanza magnetica ad alto campo (3T) nel treatment planning del carcinoma localizzato della prostata con impiego dei marker fiduciali intraprostatici per la registrazione con le immagini CT, AIRO 2011
 59. M. Signor, A. Magli, S. Fongione, M. Malisan, R. Padovani, On-line image guided-intensity modulated radiotherapy (IG-IMRT) vs off-line image guided-3D conformal radiotherapy (IG-3DCRT) e frazionamento alterato (simultaneous integrated boost) vs convenzionale nel trattamento del carcinoma prostatico ad alto rischio: analisi delle implicazioni organizzative, gestionali ed economiche applicando i nomenclatori prestazionali tariffari regionali, AIRO 2011
 60. P. Sharp, S. Christofides, C. Caruana, W. van der Putten, R. Padovani, H. Bosmans, A. Torresin, J. Hand, P. Allisy-Roberts, K-U Kasch, The role of FOMP in European medical physics, Medical Physics in the Baltic States, 9 (2011) Proceedings of the International Conference "Medical Physics in the Baltic States" 13-15 October 2011, Kaunas, Lithuania
 61. J. Geleijns, É. Breatnach, A. Calzado Cantera, J. Damilakis, P. Dendy, A. Evans, K. Faulkner, R. Padovani, W. Van Der Putten, L. Schad, R. Wirestam, T. Eudaldo, Core curriculum for medical physicists in radiology: Recommendations from an EFOMP/ESR working group, June 2011
 62. De Angelis, Risica, Bonutti, Fattibene, Padovani, Non-Medical Imaging Exposures: A Pilot Study of the Italian Situation, IRPA 2012
 63. Almén A Ducou le Pointe H; Frank A; Paulo G, Griebel J, Christofides S, Leitz W, Padovani R, Schieber C, Schmitt-Hannig A, Vanhavere F, Vock P., The European Medical ALARA Network - A European Initiative To Improve Engagement Of Stakeholders In The Medical Sector, IRPA 2012
 64. Padovani R, Duran A, Lefaure C, Le Heron JLH, Miller DLM, Sim HKS, Vano EV, International Project on Individual Monitoring and Radiation Exposure Levels in Interventional Cardiology, IRPA 2012
 65. A. Duran, S. Kui Hian, D. L. Miller, J. Le Heron, R. Padovani, E. Vano, A Summary of Recommendations for Occupational Radiation Protection in Interventional Cardiology, Catheterization and Cardiovascular Interventions (2012)
 66. W.E. Muhogora a, A. Trianni, F. Toso, A. Devetti, R. Padovani, P. Msaki, R. Kazema, Comparison of image quality and patient dose for chest x-ray examinations on conventional and low cost computed radiography systems, Radiography 18 (2012) 275-278
 67. R. Padovani, Assessing and Reducing Exposures to Cardiology Staff, Int. Conf. Radiation Protection in Medicine, WHO-IAEA (submitted for publication)
 68. R. Padovani, A.Duran, C. Lefaure, J. Le Heron, D.L. Miller, M. Rehani, H.K. Sim, E. Vano, ISEMIR—an international database to optimise occupational radiation protection in Interventional Cardiology, Int. Conf. Radiation Protection in Medicine, WHO-IAEA 2012 (Conference proceedings)
 69. J. Le Heron, R. Padovani, A.Duran, C. Lefaure, J. Le Heron, D.L. Miller, M. Rehani, H.K. Sim, E. Vano, ISEMIR—an international database for optimisation on of occupational radiation protection in Interventional Cardiology, Int. Conf. Radiation Protection in Medicine, WHO-IAEA 2012 (Conference proceedings)
 70. I. Simonetti, E. Piccaluga, M. R. Chiesa, M. G. Andreassi, R. Padovani, G. Bernardi, G. Guagliumi, E. Picano, Radiation awareness and safety practices in the cardiac catheterization laboratory: Results of a survey among Italian cardiac cath lab workers (submitted for publication)