CardiOCARE

Newsletter

Editorial

Prof. Dimitrios Fotiadis (Coordinator, UOI)

It is with great pleasure to welcome you all to another update on our journey towards revolutionizing cardiovascular care for elderly breast cancer patients. Over the past months, our consortium has focused on different scientific and technological aspects towards the development of innovative solutions for enhancing the diagnosis, treatment, and management of the elderly multimorbid patient with breast cancer therapy induced cardiotoxicity.

Regarding, the clinical study, patient recruitment has started at all clinical sites and 230 patients have been recruited. Furthermore, the analysis of the retrospective dataset of 1.587 patients is progressing. Moreover, we are making great progress in the integration of machine learning algorithms into the risk stratification model which allows the support of the clinical decision, aiming to improve the accuracy and efficiency of personalized treatment strategies.

As we progress through the ongoing phases of the project we are actively working with stakeholders including clinicians, patient organizations, and cancer societies to ensure that our research findings translate into clinical practice. Collaboration with healthcare providers, regulatory agencies, patient organizations, and industry partners is crucial for the adoption and implementation of our innovations, ultimately leading to better outcomes for patients with cardiovascular diseases. During this time, CARDIOCARE is hosting a regulatory workshop in June 2024, which will include important experts in the field of tele-health systems and risk stratification, medical devices in cardiovascular health and big data for patient profiling and monitoring.

In this newsletter, an interesting article about the fascinating world of AI and its potential to forecast overall health status and quality of life is presented.

Moreover, acknowledging the diverse challenges of breast cancer CARDIOCARE had the privilege of collaboratingwith the PREFERABLE project to enhance its understanding of patients' overall well-being. You can learn about the innovative PREFERABLE project, focused on leveraging exercise to combat fatigue in patients with advanced breast cancer. Also, you can read about the experience of a young researcher participating in a high-impact European project like CARDIOCARE. Finally, the tangible outcomes and exploitable results of CARDIOCARE are presented.

I encourage everyone to stay engaged and informed, as we have exciting updates and breakthroughs to share in the upcoming months. Together, let us continue to push the boundaries of innovation and transform the landscape of cardiovascular care. You can visit our
 for more details. You are also welcome to share your comments on our social networks.

Enjoy the reading!

Can AI predict the overall health status and QoL, using data from wearable devices?

Natalie Saltari, Physicist, Hellenic Mediterranean University, Greece

The World Health Organization (WHO) defines health as follows:

"Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity."

This definition highlights a comprehensive view of health encompassing physical, mental, and social aspects. It underscores the idea that health goes beyond the mere absence of illness, signifying a state of overall well-being in multiple dimensions.

Quality of life (QoL) is a related concept that extends beyond health and captures the overall well-being of individuals or populations, reflecting both positive and negative aspects at a specific point of time. According to WHO, QoL is defined as" an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns". QoL assessments often consider factors such as physical health, mental health, social relationships, personal beliefs and the environment. Artificial Intelligence (AI) has the potential to contribute significantly to predicting overall health status and QoL, offering a promising alternative to conventional methods. Traditional QoL assessments methods rely on subjective reports and informal questioning which can lead to inaccurate insights into an individual's well-being. By leveraging advanced algorithms and processing vast and complex datasets, AI can improve quantification, standardization and objectivity, and automate the analysis of diverse information sources, including patient-reported outcomes, medical images, physiological signals, and social media interactions, leading to more personalized interventions. This can be achieved by collecting a wide range of physiological and behavioral data from wearable devices, such as fitness trackers, smartwatches, and other health monitoring devices, offering insights into physical activity, sleep patterns, stress levels, and overall health. Wearable technology, capable of providing immediate and continuous vital sign data, facilitates swift discovery of key aspects defining overall QoL.

One area where wearable sensors show promise is in sleep quality estimation. Sleep is a vital component for restorative processes, memory consolidation, and overall holistic health. Thus, wearable devices are equipped with sleep tracking capabilities to monitor sleep duration, cycles, and disturbances during the night. Poor sleep quality is associated with various health issues, including increased stress levels and impaired cognitive function. By assessing sleep patterns through wearable data, we can gain insights into an individual's sleep hygiene and its impact on overall QoL.

Furthermore, wearable sensors play a crucial role in assessing an individual's QoL when it comes to monitoring physical activity. Regular exercise is closely tied to overall well-being, and wearables offer detailed insights into exercise routines, step counts, and movement patterns. Therefore, GPS technology is integrated into wearable devices to introduce the concept of life-space mobility, a metric that gauges how far a person ventures from their residence. Analyzing this data, adherence can be measured to recommended activity levels, providing valuable information about an individual's fitness and potential QoL.

The perception of pain, a complex and subjective sensory phenomenon, defies easy quantification due to variations in intensity and quality. In response, recent developments in wearable technology have emerged as valuable tools for quantifying pain, a critical aspect of QoL. These wearables sensors can measure factors such as heart rate variability, skin temperature and changes in activity levels, which can indicate the presence and severity of pain. Additionally, wearable devices may incorporate self-reported pain assessments through user input or integrate with pain tracking apps. This real-time monitoring informs the process of clinical decision-making, guiding healthcare professionals to intervene promptly with pain management strategies, such as medication adjustments, relaxation techniques, physical therapy, or lifestyle modifications.

Moreover, smart devices and wearable technologies contribute to identifying stress levels and emotional well-being, and the physiological process linked to their detection. Heart Rate Variability (HRV) is a physiological parameter reflecting autonomic nervous system activity and, is measured by many wearables, as it allows to identify periods of heightened stress or emotional strain, contributing to a more comprehensive understanding of mental health and, consequently, QoL. Capturing patients' daily experiences via smartwatches and fitness-monitoring technology could produce accurate physiological data, showing for instance, differences in step count, sleep duration, and other measures among individuals, and as a result, detect early signs of possible mental health issues.

Wearable sensors extend beyond physiological parameters. They can capture data related to environmental factors, such as air quality, noise exposure, and sunlight exposure. Long-term exposure to these external elements has a negative impact on people's QoL in the physical and psychological domains. They have been associated with ischemic heart diseases, sleep disturbance, depression and anxiety. Integrating environmental data with physiological metrics provides a holistic view of an individual's daily life and enhances the accuracy of quality-of-life estimations.

The CARDIOCARE project, in its pursuit of personalized cancer care, recognizes the importance of overall health status and aims to develop a multiscale risk stratification model for early detection, prevention and treatment of cardiotoxicity to improve QoL. To enrich the predictive model, monitoring technologies are introduced to provide a better patient-oriented care pathway. Wearable sensors (Heart zone sensor) coupled with wrist watches and a hand grip electronic dynamometer will monitor heart rhythm, heart rate variability, sleep/fatigue and physical activity.

Furthermore, eHealth applications (ePsycHeart, EHealtHeart) and mobile apps, do not only monitor and inform patients and physicians about emotional, functional, and physical well-being but also counteract dispositional, emotional, and behavioral risk factors for cardiotoxic effects and lower QoL post-cancer therapy. Through this holistic approach, CARDIOCARE aims to enhance early diagnosis and provide clinicians with invaluable insights into patients' well-being, ultimately leading to more effective management and improved outcomes for individuals at risk of cardiac toxicity, particularly in elderly breast cancer patients.

In summary, the integration of technology and the deep understanding of the many different aspects of QoL hold a promise for improving well-being and advancing healthcare outcomes providing valuable intuitions for decision-making. It is important to note that while AI can contribute significantly to understanding and predicting health status and QoL, it may not cover all domains equally comprehensively. While wearable technology is effective for monitoring physical and mental health, it has limitations in assessing social relationships and environmental factors due to the nature of data collection.Predicting social relationships,personal beliefs, and environmental impact exclusively from wearable device data might be more challenging and may require additional contextual information or different data sources.

The PREFERABLE Project: Project on Exercise for Fatigue Eradication in Advanced Breast cancer to improve quality of life

Prof. Anne May, Julius Center for Health Sciences and Primary Care, Epidemiology & Global Health, University Medical Center Utrecht, Utrecht, Netherlands

Breast cancer is the most common cancer in women worldwide with an estimated 1.7 million new cases each year. Up to approximately 40% of women who have been diagnosed with early breast cancer will eventually develop metastases.

Patients with metastatic breast cancer (mBC) face a median overall survival of 2-3 years and a 5-year survival of 34%. It is the leading cause of cancer death among women and by 2030, a 43% increase in absolute number of deaths is expected.

Patients with mBC experience significant disease and treatment-related side effects, such as fatigue, nausea, insomnia, hair loss, loss of appetite, pain and digestive tract problems. The most common and debilitating side effect is fatigue, which has a constant presence during treatment and increases incrementally with consecutive treatment cycles. Hence, interventions are needed that alleviate fatigue and improve QoL of patients with mBC.

PREFERABLE is an international collaborative project that focusses on physical exercise to combat fatigue in patients with metastatic breast cancer (mBC), funded by the European Union within its research and innovation programme Horizon 2020.

PREFERABLE's ultimate goal is to improve the health and wellbeing of patients suffering from mBC by alleviating cancer-related fatigue and improving health-related QoL. Exercise interventions in the curative setting lay the groundwork for assessing the effect of exercise on fatigue and QoL in patients with mBC. The PREFERABLE Consortium aims to reach this goal, by:

- Developing and implementing an optimal exercise intervention in two settings: i) a supervised training program in community / hospital-based fitness centres and/ or exercise facilities at physical therapy clinics and supplemented with ii) an unsupervised training program (home-based exercise training).
- Assessing the effects of this structured and individualized exercise intervention in patients with mBC on the primary endpoints fatigue and health-related QoL (PREFERABLE-EFFECT study; a multinational randomized controlled phase 3 trial).
- Exploring the different perspectives of patients on exercising after a diagnosis of mBC in several countries (PREFERABLE-PERSPECTIVE study; a mixed-methods study).
- Providing recommendation for clinical guidelines for the inclusion of an exercise intervention as supportive care in patients with mBC in the palliative setting.
- Deciphering the underlying molecular mechanisms of the exercise intervention effects and identify biomarkers to predict success of future interventions and personalise the exercise prescriptions.

Investigating how healthcare systems in different EU countries are organized around integrating exercise interventions into cancer care and studying cost-effectiveness of the exercise intervention.

Based on these results, the PREFERABLE project will generate solid and conclusive evidence of the beneficial effect of exercise on cancer-related side effects and patients' QoL and contribute towards reshaping medical practice, and improving clinical guidelines and recommendations.

Mutual areas of interests with CARDIOCARE include the improvement of health and QoL of patients with breast cancer by implementing appropriate health interventions. PREFERABLE creates, executes and evaluates an optimal exercise intervention in hospitals and physical therapy centres and at home. CARDIOCARE, tests new patient-oriented eHealth behavioural and psychological interventions, providing novel actionable insights to counteract cardiac toxicity and improve intrinsic capacity and QoL of the elderly breast cancer patient.
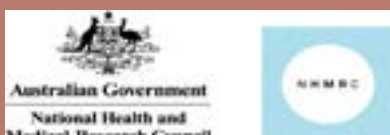
More information about the project on the website: https://www.h2020preferable.eu/
Project duration: 01/01/2019 – 30/06/2024
Follow the project on social networks: Twitter - @ PREFERABLE_MBC

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What is the experience of a young researcher of participating in a European project with great impact on healthcare like CARDIOCARE? An interview with Dr. Maria-Angeliki Tolli, MD

Maria-Angeliki Tolli is PhD candidate at the Department of Oncology-Pathology, Karolinska Institutet, Sweden
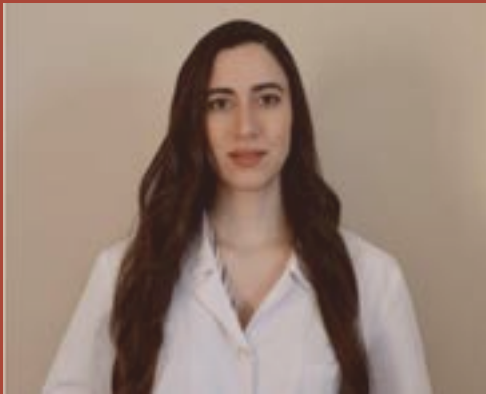
Could you tell us a bit about yourself?

I received my Doctor of Medicine degree from the University of Ioannina Medical School, in Greece in 2021. Immediately after, I visited Sweden for a research and clinical internship at Karolinska Institutet and the Karolinska University Hospital, within the framework of the EU's Erasmus+ Programme. I attended my Erasmus research internship in Theodoros Foukakis group, where I was first, introduced to translational breast cancer research. After this fascinating experience, I decided that I would like to work and expand my knowledge on breast cancer research. I am truly grateful for the chance to start my journey as a young researcher by joining Theodoros Foukakis's group as a research assistant. In our group, we work with clinical studies, and this is when I was first introduced to the CARDIOCARE project. Currently, I am a PhD candidate in the same group, at the Department of Oncology-Pathology, Karolinska Institutet, focusing on exploring prognostic and predictive markers after neoadjuvant therapy in breast cancer.

What are the main opportunities for a young researcher participating in a research program at European level?

Participating in a European-level research project, like CARDIOCARE, is a great opportunity for young researchers like me. It provides a platform to collaborate with experts across diverse fields, fostering a rich interdisciplinary environment. This collaboration has not only broadened my understanding of complex issues but also facilitated the exchange of innovative ideas.

Furthermore, the greatest opportunity is to witness how all these different experts in different fields contribute and come together to address a common goal which is the effective management of elderly multimorbid patients facing cardiac toxicity induced by breast cancer therapy.

Finally, contributing to the CARDIOCARE multidisciplinary team as a young researcher has allowed me to acquire and refine essential skills like project management, collaboration, and effective communication. In my opinion, these qualities are invaluable for a young researcher's development, contributing both to professional and academic growth.

What difficulties did you encounter?

In the beginning, it was challenging to understand the complex formal aspects of such a large project. Navigating through these was complicated, probably due to my lack of experience in such kinds of projects. Moreover, the project's multidisciplinary nature, posed a challenge for me in terms of integrating and understanding the various tasks across the project. As time progressed, the workflow gradually improved.

From a practical standpoint, another significant challenge emerged in the ethical application of research involving human subjects in Sweden. We encountered several difficulties along the way to obtain the Ethical Committee approval for the prospective study of the CARDIOCARE project. We had to take several steps to comply with both local and broader European Regulations. I believe this stage is one of the most contentious aspects of Swedish involvement in European projects.

Despite the challenges, the ongoing effort against breast cancer continues, hoping that we are moving closer to a world where breast cancer will no longer be a life-altering diagnosis but a challenge we can overcome together with the patients.

How do you think participating in CARDIOCARE might impact your future professional career?

I think my participation in CARDIOCARE will have several positive impacts on my future professional career. Firstly, the multidisciplinary nature of the project exposes me to a diverse range of expertise, fostering a broader understanding of complex challenges in healthcare.

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This wider knowledge will equip me with valuable insights that I will be able to use in various professional domains.

Additionally, engaging in a European-level research consortium like CARDIOCARE provides extensive networking opportunities with professionals from different countries and disciplines. Building these connections will help me open doors for potential collaborations and will enhance my professional network.

Overall, participating in CARDIOCARE offers a unique combination of knowledge enrichment, networking opportunities, and practical skills that will significantly contribute to the advancement of my professional career in research and healthcare. This experience has so far been invaluable, and I am looking forward to seeing the results of our efforts.

The exploitable results of CARDIOCARE

Natalie Saltari, Physicist, Hellenic Mediterranean University, Greece & Anca Bucur, Philips, Netherlands

The exploitable results -the achieved and/or expected results coming from CARDIOCARE- are focusing on the innovative aspects of the project and aimed at managing the cardiotoxicity in elderly multimorbid patients induced by breast cancer therapy.

A primary exploitable result is the CARDIOCARE platform and services, acting as a central hub for integrating diverse services and tools. This platform is designed to facilitate personalized patient monitoring and assisting clinicians in early-stage cardiotoxicity prediction and enabling collaborative decision-making to mitigate long-term cardiotoxic effects.

Furthermore, the project has introduced mHealth mobile applications, such as ePsycHeart and eHealtHeart, to provide clinicians with new services that extend beyond traditional electronic health record (EHR) and to support psychological and wellbeing interventions. These applications deliver a comprehensive solution for self-managing and reporting health-related data, aiming to consistently evaluate and monitor patients, enhancing their QoL and facilitating self-care.

Another significant outcome is the identification and validation of biomarkers for patient stratification and monitoring. These biomarkers, encompassing genomic, miRNA, and metagenomic markers, are crucial for understanding the individualized responses to treatment and predicting cardiotoxicity in cancer patients.

The project also underscores the importance of AI and analytics, with predictive models that integrate various data types to assess the risk of cardiotoxicity. These models analyze structured and unstructured "multi-domain' data using machine leaning (ML) including clinical data, imaging, genetic and miRNA, data from wearable and patient reported outcomes, providing healthcare professionals with actionable insights for patient care.

Exploitable assets extend to datasets comprising clinical and imaging data, which are invaluable for research and development, enabling further exploration of the relationships between different health factors. These structured datasets (including clinical, cardiac imaging, psychological biomarkers and omics, intrinsic capacity, and QoL indicators), consisting of retrospective data from 1560 patients from 5 clinical centers (IEO, BOCOC, KSBC, NKUA, UOI) and 750 prospective patients from 6 clinical partners, (IEO, BOCOC, KSBC, UOI, NKUA, UOL) serve as the foundation for developing a risk stratification model to identify elderly breast cancer patients at risk for cardiotoxicity.

The Psychological Minimum dataset, developed within the project, addresses the need for standardized psychological assessment tools. It includes validated questionnaires measuring life orientation, affect, health, life satisfaction, and self-control—essential for evaluating the psychological impact of cardiotoxicity on patients.

Refined clinical workflows and contributions to future clinical guidelines are anticipated outcomes of the CARDIOCARE project. These advancements are positioned to improve current protocols and potentially develop novel biomarkers into diagnostic tests for chemotherapy-induced cardiotoxicity in breast cancer patients.

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Key technical outcomes include data models and representation standards, such as the FHIR model for cardio-oncology datasets, alongside data transformation tools and processing pipelines. These tools enable data harmonization, providing value for future research collaborations and simplifying solution deployment in clinical settings, reducing integration costs.

Finally, the project has generated new research hypotheses, paving the way for future studies, particularly in the areas of prognostic biomarkers for cardiotoxicity and the empirical encoding of associations between the gut microbiome, genetic polymorphisms, and miRNA levels.

In conclusion, the CARDIOCARE project's exploitable results are diverse and hold significant potential for advancing the field of cardio-oncology. The project's commitment to creating sustainable value ensures that these innovations will continue to benefit patients, healthcare professionals, and researchers long after the project's completion. The collaborative efforts of the consortium members, coupled with strategic exploitation plans, positions CARDIOCARE to make a lasting impact on the management and treatment of cardiotoxicity in breast cancer patients.

Conferences

IEEE International Conference on Bioinformatics and Biomedicine (BIMB 2023) (Istanbul, Turkey, December 2023)

CARDIOCARE participated in BIBM 2023 with a paper entitled "CARDIOCARE platform: A beyond the state-of-the-art approach for the management of elderly multimorbid patients with breast cancer therapy induced cardiac toxicity" for the workshop on Processes and Algorithms for Healthcare and Life Quality Improvement.

3rd International Conference of Cancer Science and Therapy (online, December 2023)

Dr. Alexia Alaxandraki, BOCOC presented CARDIOCARE at the 3rd International Conference on Cancer Science and Therapy.

CARDIOCARE Events

Past Events

19th Annual Congress "Advances 2023 and Prospects 2024 in Cardiology" (Athens, Greece – December, 2023)

Dr. Keramida, NKUA, presented CARDIOCARE in the 19th Annual Congress "Advances 2023 and Prospects 2024 in Cardiology" organized by the 2nd Department of Cardiology, Athens University Hospital "Attikon".

Webinar on "Prevention and cardiovascular rehabilitation of the cancer patient" (online - November, 2023)

Prof. Naka, UOI, presented CARDIOCARE in her giving lecture "Exercise and Onco-Cardiology" for the webinar "Prevention and cardiovascular rehabilitation of the cancer patient" organized by the working group on cardio-oncology of the Hellenic Society of Cardiology.

4th Hybrid Scientific Two-Day Conference of "E.M.E.I.S." (Athens, Greece - December, 2023)

CARDIOCARE participated in the 4th Hybrid Scientific Two-Day Conference on the topic "Breast Cancer and Contemporary Challenges in Clinical Management", organized by "E.M.E.I.S." (Scientific Society of Mastology – Treatment and Support). The topic was "Breast Cancer and Contemporary Challenges in Clinical Management".

Innovent Forum 2024 (Larissa, Greece - February, 2024)

CARDIOCARE participated as exhibitor in the Innovent Forum that took place in the JOIST Innovation Park where live demos of the CARDIOCARE solution and apps were presented to the participants.

Event at the Medical School of the University of Cyprus (Cyprus – February, 2024)

Dr. Athos Antoniadis, STREMBLE, gave a lecture regarding the state of molecular research in Cyprus and its impact on clinical practice at the Medical School of the University of Cyprus and presented CARDIOCARE. Moreover, the inclusion/exclusion criteria in the protocol and the potential impact of the outcomes of the project were presented.

Forthcoming Events

7th Hellenic Congress Oncology (Thessaloniki, Greece – April 2024)

CARDIOCARE will organize a round table on Cancer and Cardiotoxicity in the 7th Hellenic Congress Oncology.

Regulatory Workshop (Brussels, Belgium, TBA)

A regulatory workshop is organized by ESC to be held in Brussels, Belgium. In this workshop, the required steps and overall regulatory roadmap will be defined to ensure that the information and data conveyed and discussed with the regulatory experts are presented in the right way and form.

Other news

The Pillow Positive Project by COCOMAT (February, 2024)

COCOMAT's Pillow Positive Project provided heart-shaped pillows to patients that participated in the CARDIOCARE clinical trial at the University Hospital of Ioannina and Aretaeio University Hospital, aiding women recovering from breast cancer surgery. CARDIOCARE expressed its gratitude highlighting the pillows' role in easing pain, reducing swelling, and protecting incisions.

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Dr. Kalliopi Keramida and Dr. Dorothea Tsekoura in the Cardio-Oncology council of the Hellenic Cardiological Society.

Dr. Kalliopi Keramida, Consultant Cardiologist at General Anti-cancer Hospital "Agios Savvas" and member of the NKUA team of CARDIOCARE, was appointed as chairperson in the Cardio-Oncology council of the Hellenic Cardiological Society. Also, Dr. Dorothea Tsekoura, Consultant Cardiologist at Aretaieio University Hospital and member of the NKUA team of CARDIOCARE, is an elected nucleus member of the Cardio-Oncology council of the Hellenic Cardiological Society.

CARDIOCARE on the greek TV show "Health above all'.

CARDIOCARE was presented on the TV Show "Health above all" ("Υγεία πάνω απ΄ όλα") on the greek TV network ANT1. Dr. Dorothea Tsekoura and Dr. Kalliopi Keramida (NKUA) talked about cardiotoxicity in breast cancer therapies. Follow the link to see the episode on the YouTube channel of the project.

Women, cancer and the heart: what every woman needs to know (March, 2024)

In celebration of the International Women's Day on March 8, 2024, Dr. Kalliopi Keramida, Consultant Cardiologist – General Anti-cancer Hospital "Agios Savvas" & Chairperson of the CardioOncology Working Group – wrote an article with the title "Women, cancer and the heart: what every woman needs to know", sharing crucial insights on the intersection of women's health, breast cancer, and heart conditions. Follow the link to view the article.

ESC Spring Summit (Nice, France – March 2024)

CARDIOCARE was communicated in the ESC Spring Summit 2024 that took place on the 7th and the 8th of March 2024 at the European Heart House, in Nice, France.

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CARDIOCARE People

Dr. Dorothea Tsekoura (NKUA)

Dr Dorothea Tsekoura (F) MD is the Scientific Director of the Cardiological Department in Aretaieion University Hospital. She graduated from the Medical School of National and Kapodistrian University of Athens, Greece in 1996. In 2003 she earned PhD in the National and Kapodistrian University of Athens. She completed her medical training in cardiology in 2005 and from 2014 till now she serves as Specific University Educational Staff in Athens Medical School of National and Kapodistrian University of Athens. Her research interest is focused on Clinical Cardiology, Cardiovascular Imaging and Cardio-oncology.

Dr Tsekoura since February 2024 is an elective member of the Working Group of Cardio-Oncology of the Hellenic Society of Cardiology and member of the Council of Cardio-Oncology of the European Society of Cardiology. She is an active member of Greek and European Society of Cardiology (Working Group on Aorta & Peripheral Vascular Diseases, Working Group on Myocardial & Pericardial Diseases Working Group on e-Cardiology) and she has authored papers in medical journals indexed in PubMed (Citations 592, h-index 9, i10-index 9).

Dr. Kalliopi Keramida (NKUA)

Kalliopi Keramida, MSC, PhD, FESC, FHFA, FICOS is Cardiologist Consultant in General Anti-Cancer, Oncological Hospital, Agios Savvas, in Athens, Greece. She is certified in cardiovascular imaging, heart failure and Cardio-Oncology. She is the Chairperson of the Working Group of Cardio-Oncology of the Hellenic Society of Cardiology and an active member of the Cardio-Oncology Council and a Committee member of the Study Group on Cardio-Oncology of Heart Failure Association. She is also in the Executive Board of the Greek Chapter of Cardio-oncology of ICOS (International Cardio-Oncology Society). Her clinical and research interests include prevention of cardiotoxicity in oncological patients, specifically in women with breast cancer and optimization of long-term surveillance of cancer survivors.

Prof. Manolis Tsiknakis

Prof. Manolis Tsiknakis received his Master (1983) and PhD (1989) degrees from the University of Bradford, UK. He performed his post-doctoral training at the University of Bradford (1990-1991) and the Institute of Computer Science at FORTH (1992). Subsequently he was elected as a Principal Researcher at the Computational Biomedicine Laboratory (CBML) of the Institute of Computer Science of the Foundation for Research and Technology Hellas (FORTH/ICS), acting as the lab Director between 2000 - 2006. He was the recipient of FORTH's award for the most innovative applied research in 2004 and was an eEurope/eHealth award winner in 2003. Since 2012 he is a Professor of Biomedical Informatics and eHealth (BMI lab) at the Department of Electrical and Computer Engineering of the Hellenic Mediterranean University and a visiting Professor at FORTH/ICS. He is an associate editor of the IEEE Journal in Biomedical Informatics and member of the Editorial Board of the European Journal in Biomedical Informatics. He is the author of over 300 publications. His main areas of expertise include approaches for semantic health data integration and interoperability of health information systems; affective computing and its application in developing smart eHealth solutions; service platforms for pervasive eHealth and mHealth services.

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