



## **Proof of Concept of Model-based Cardiovascular Prediction**

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# **Deliverable 10.2**

## **Updated dissemination materials**

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**Abbreviations**

DoW	Description of Work
MDP	MD-Paedigree
HeC	Health-e-Child
SeC	Sim-e-Child
AVD	Aortic Valve Disease
CoA	Aortic Coarctation

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**DISCLAIMER:** This document is an update of D10.1 – Dissemination and Exploitation strategy plan and first dissemination materials, submitted at Month 3 (December 2013). It doesn't reproduce the preliminary Exploitation part, which is not yet relevant for dissemination purposes.

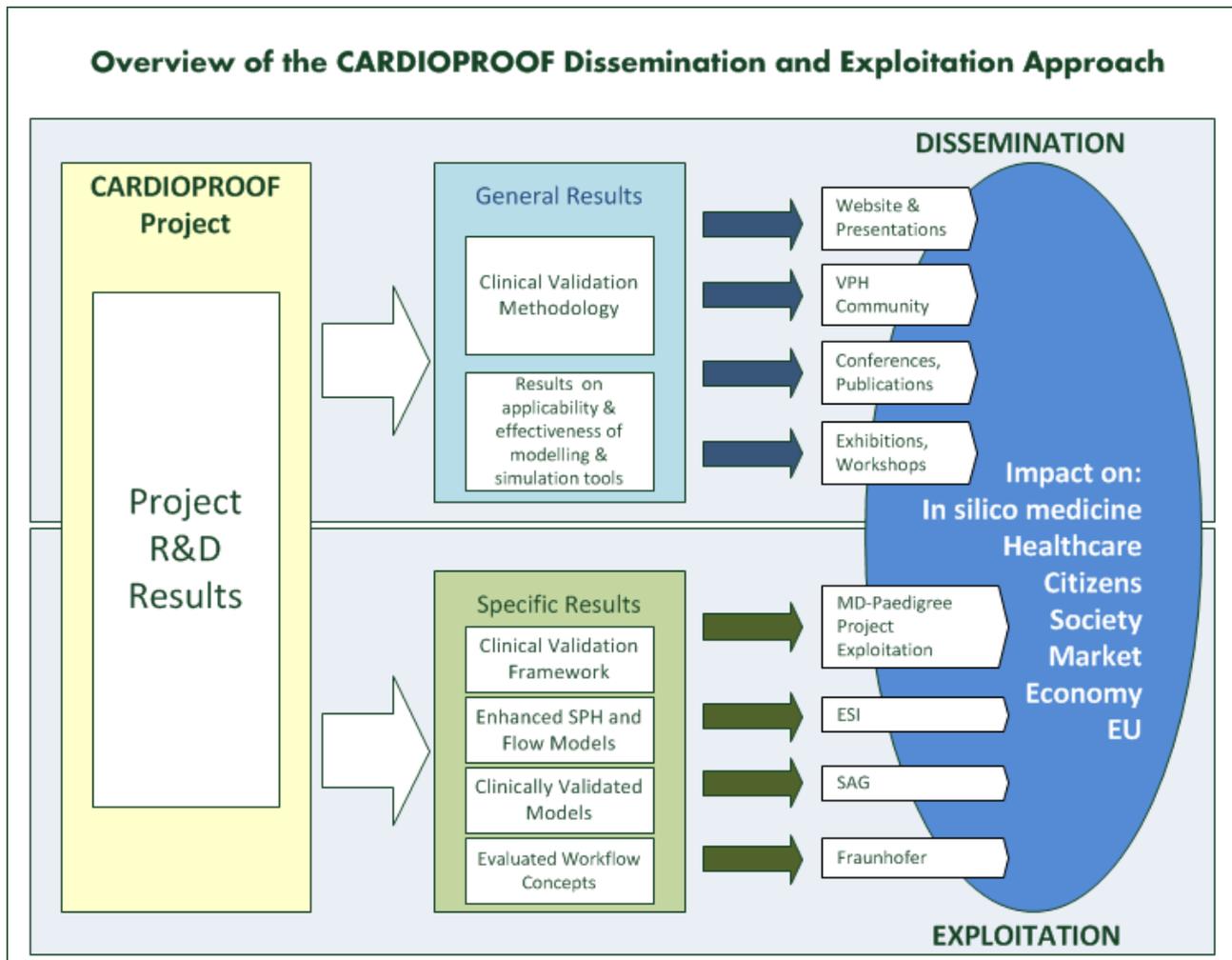
The major updates performed (and are clearly highlighted in the text) have been the following:

- The First Annual Newsletter (p.14);
- The project ID-CARD (p.17);
- A strategy for the usage of the social networks (p.12);
- Networking activities with other VPH projects (p.13);
- Some updates to the website (p.17);
- An updated list of dissemination events (which substitute the original one, p. 11);
- A new version of the .ppt template for project presentations (p.14);
- An updated list of publications and other dissemination initiatives carried out by the partners of the consortium (p.19).

Some dissemination initiatives are planned for the forthcoming months (see p.11), as soon as the first results of Cardioproof's scientific research will start to be consolidated. An update of the current deliverable will again be submitted at M24.

## Introduction

The purpose of this document is to set out the strategies for dissemination and exploitation which will be adopted by the Cardioproof project. These strategies have been developed in parallel but with the aim that should work together synergistically, so that the dissemination acts as a marketing strategy for the exploitation and the exploitation activities help publicise the work conducted during the project. The overview diagram in Figure 1 shows how the dissemination and exploitation work together in parallel.



**Figure 1 Overview of dissemination and exploitation approach**

Since this is the first version of D10.1, it is only the preliminary action plan for dissemination and exploitation. Therefore, this report should not be considered as exhaustive and immutable, rather is a living document that will be updated and refined throughout each phase of the project. These updates will be useful not only to provide an outlook on the outcomes of the various planned dissemination and exploitation activities, but also to document any additional activities which may be adopted as deemed appropriate by the project team.

Cardioproof's dissemination will follow the following principles, which have proved to be particularly effective within previous EC projects (Health-e-Child and Sim-e-Child in particular):

- dissemination should be viewed as “knowledge sharing” and, as with all communication, works best when it is bi-directional;
- dissemination messages must be tailored to each audience, organising specific dissemination activities and channels for each target audience;
- whenever possible, and always when communicating with the general public, the work should be disseminated produced in everyday language rather than in an academic or industrial language;
- facilitate the involvement of further clinical centres in the initiative, which will organically grow the dissemination network while also expanding the base of data and knowledge in the consortium;
- establish close collaboration with related projects;
- organise seminars and workshops at relevant conferences in the area, producing brochures and posters;
- set-up a web site dedicated to the project, this website should contain a public area for general communication as well as provide a channel for distribution of “Dissemination Objects” (DO’s)
- publish and circulate a regular newsletter to interested communities and stakeholders;
- publication of Cardioproof results in relevant international scientific journals;
- produce a series of “Dissemination Objects” (DO’s) to be made available on-line. Typically DOs will be 3-5 minute multimedia clips built from consortium presentations, talks given by consortium members and specially recorded video clips to present highlights of the consortium’s work;
- use the internet and social media as channels for the circulation of e-brochures, e-flyers, the project’s ID Card, newsletters and DO’s

More generally, the Cardioproof dissemination strategies and subsequent activities will try to mirror the core motivations of the project. As Cardioproof’s outcomes will be of great interest for a variety of different work and research communities (clinicians, caregivers, biomedical researchers, European industry, general public) both in terms of the outcomes of the validation and cost-effectiveness studies, the dissemination will pay special attention to disseminating at appropriate levels, and with the appropriate instruments – the main results of the project, while also asking for the involvement of clinicians and experts involved in the research.

The Cardioproof Exploitation Strategy is mainly predicated on leveraging the exploitation plan of the MD-Paedigree project, with which it will make a strategic collaboration.

In fact, if the Cardioproof results meet expectations, its exploitation would represent a first tangible opportunity for a major innovation in the clinical environment, advancing diagnostic and therapeutic pathways with tools whose reliability and usability will have been proven and warranted by a qualified group of typical end-users.

The Exploitation Strategy Seminar, to be organised in the first 18 months of the project, will also be a major vehicle for deciding and defining the optimum exploitation strategy or strategies. The Health Technology Assessment (HTA) will include cost analysis and assess the clinical and socio-economic impact of Cardioproof’s outcomes. These analyses will also be fed into the exploitation strategy.

### Management of the dissemination and exploitation activities

Dissemination and exploitation activities are under the responsibility of P10 Lynkeus (LYNK) and involve all the partners. WP10 will involve work throughout the length of the project. In the following table, the effort for each partner is shown.

Beneficiary number and short-name	LYNK	DHZB	UCL	OPBG	FH	SAG	ESI	MUG	GNUBILA	LSE	Total
WP 10	30.00	3.00	1.00	1.00	1.00	1.00	1.00	1.00	0.50	1.00	40.50

### Document structure

The first version of D10.1 is separated into four further informative sections:

- Section 2 is devoted to Cardioproof dissemination strategy, providing an outline of the project and its message.
- Section 3 is dedicated to the channels that Cardioproof has identified for disseminating its actions and results, the target audiences and the instruments for communicating with them.
- Section 4 provide a brief overview of the exploitation strategy, which will further implemented and refined in the subsequent exploitation seminar and exploitation plan deliverables.

## Dissemination strategy

An effective communication strategy is based upon correctly identifying the messages, target audiences and media that should be used.

Cardioproof has identified three principal messages:

1. Cardioproof is an important step towards the introduction of VPH technologies into the clinical environments.
2. The two cardiovascular diseases which Cardioproof will address (Aortic Valve Disease (AVD) and Aortic Coarctation (CoA)) both have a high incidence in the population and entail significant costs for the community.
3. Cardioproof will reuse and take advantage of databases and tools implemented in previous project, thereby exploiting the investments made in the past, both in money and in research efforts.

The primary target audiences are:

- Clinical community – mainly cardiology professionals
- Scientific community– bioinformaticians, with particular significance given to the VPH community
- Pharmaceutical and medical device industry
- Widest possible audience - spanning from health professionals, to policy makers, researchers and the general public

A number of dissemination channels have been identified:

- Project website
- Project newsletter
- Scientific publications
- Scientific conferences
- Mainstream media (newspapers, television)
- VPH Institute dissemination channels

## The Cardioproof messages

### Towards the introduction of VPH technologies into the clinical environments

Previous Virtual Physiological Human (VPH) efforts developed some powerful tools for computer-based modelling of various cardiovascular (CV) diseases, raising significant expectations to make such tools available for early diagnosis and for predicting disease behaviour and evolution as well as treatment outcomes.

As yet, however, the translation into a routine clinical environment has remained challenging and substantially bounded. Despite an increasing interest from the medical community to apply VPH concepts to the field of CV diseases, limited results have been achieved so far. The reason for this is most likely due to a lack of sufficient:

- *Validation*: Data of methods validity in clinical studies is sparse and yield, if at all, only low evidence levels
- *Comparative effectiveness*: The comparative effectiveness of the methods is still unknown:
  - Do they result in different treatment decisions (comparative clinical efficacy)?
  - What is the comparative effect on costs (e.g., cost-to-diagnosis, cost-to-treatment)?

- *Usability and interoperability:* Software application and data management do not comply with clinical requirements (too complex, and too labour and time consuming)

With this message Cardioproof wishes to make clear that it is a project aimed at bridging these knowledge and technology gaps and so bring VPH technologies into clinical centres.

This message is geared towards the clinical and bioinformatics communities, particularly those involved in cardiology and/or VPH-based technology and research.

The primary channels for this message will be:

- Project newsletter
- Scientific publications
- Scientific conferences
- VPH Institute dissemination channels

### Looking at two important cardiovascular diseases

Cardioproof focuses on patients with AVD and CoA, which if left untreated can progress to heart failure. These two diseases are of particular interest because:

1. Modelling methods that allow prediction of the evolution of disease or treatment outcomes could be significantly more effective than current practice.
2. VPH efforts have already generated several high quality modelling tools that are ideally suited to support physicians in decision making.
3. Finally, the two diseases have a huge socio-economic impact. Currently, more than 50,000 aortic valve replacements are reported per year in the EU. In addition, CoA is one of the most frequent congenital heart diseases, often requiring repeated interventions.

This message is aimed at the widest possible audience and has at its core the idea that Cardioproof is tackling two of the cardiovascular diseases with the greatest impact on EU citizens. The main channels for this message will be:

- Project website
- Mainstream media (newspapers, television)

### Standing on the shoulders of giants

Cardioproof will have access to the German Competence Network for congenital heart disease ([www.kompetenznetz-ahf.de](http://www.kompetenznetz-ahf.de)) which is the largest central imaging database of the world of its kind, with reference values of patients and, in addition with MR imaging data of healthy subjects (infants, children and adults). This database forms a unique opportunity for modelling haemodynamic changes that occur with somatic growth. Our hypothesis is that these data will permit to extrapolate haemodynamic findings and thus to estimate the ***evolution of disease (2-3 year midterm outcome)*** in CoA.

Furthermore, Cardioproof will build upon to data sources, such as the CaseReasoner developed in the Health-e-Child FP6 project and the simulation tools developed in the Sim-e-Child FP7 project.

Finally, Cardioproof plans to integrate with the MD-Paedigree project which includes all functionalities developed in HeC and SeC, and which is developing an advanced digital repository.

In addition, while MD-Paedigree will achieve its first results, Cardioproof will be able, in the first place, to

rely on the implementation of all HeC-SeC tools into routine clinical practice already taking place at the Ospedale Pediatrico Bambino Gesù (OPBG), one of its 3 clinical Consortium partners. OPBG has in fact recently been equipped with the Paediatric Digital Cardiology Repository (PCDR), constituting a first version of the MD-Paedigree Science Gateway starting in March 2013, to establish the first repository of its kind.

The central point to this message is that by re-using and building upon the outputs of other projects Cardioproof will not just take their work forward, but help provide a return on the investment made in those projects. This message is mainly targeted at the scientific community. It's main channels will be:

- Project newsletter
- Scientific publications
- Scientific conferences
- VPH Institute dissemination channels

### Identification of target groups and end users

As already explained above, in order to effectively achieve the results of the project requires a significant effort aimed to establish links with distinct - but overlapping - target groups and end users: clinicians, IT specialists, biomedical researchers, health care providers, and health care authorities and policy makers. Furthermore, the VPH clinical proof of concept in CV diseases that will be performed in Cardioproof can be of direct interest for both the:

- Device industry (especially for valvular disease and coarctation, including valves, valved stents, and stents);
- Pharmaceutical industry (especially for treating/preventing heart failure).

To make it possible to reach each of this sub-groups will require the activation of different channels, two of which are:

- conference activity, be this at periodic venues or specific Cardioproof co-organised or co-sponsored events.
- clustering activities with other on-going actions/projects sharing similar or complementary goals, and

With regard to the latter, it has been already explained that the project is in the position to exploit numerous opportunities. With regard to the first channel mentioned, a number of possible events to which Cardioproof's consortium will actively participate has been provided, but the clustering opportunities will be continuously monitored and exploited.

## Dissemination channels

### Cardioproof dissemination events

At the time of writing, Cardioproof has still not participated to any conference and have still not organised networking events. Nevertheless, as described in the DoW, the Cardioproof consortium will organise two major dissemination events to highlight project objectives and outcomes, reaching targeted audience and the wide public as well.

The event plan comprises two meetings each with a specific purpose:

- First dissemination event: This will take the form of a seminar tailored for healthcare professionals and institutions. It will present an overview of the project, highlighting objectives and clinical trial protocols;
- Final Cardioproof conference: This will set out the project's outcomes and achievements. It will be tailored to a wider audience (from healthcare professional and institution to research audience to the general public)

### Conferences and other events

#### UPDATES

Forthcoming dissemination events:

Event	When	Where
<b>Myocardial Velocity &amp; Deformation Imaging 2015</b>	February 5 <sup>th</sup> -6 <sup>th</sup> , 2015	Heverlee, Belgium
<b>IHC 2015 – 15<sup>th</sup> International HL7 Interoperability Conference</b>	February 9 <sup>th</sup> -11 <sup>th</sup> , 2015	Prague, Czech Republic
<b>ACC'15 – 64<sup>th</sup> Annual Scientific Session &amp; Expo</b>	March 14 <sup>th</sup> -16 <sup>th</sup> , 2015	San Diego - CA, USA
<b>SERVICE COMPUTATION 2015 – 7<sup>th</sup> International Conferences on Advanced Service Computing</b>	March 22 <sup>nd</sup> – 27 <sup>th</sup> , 2015	Nice, France
<b>ICCFDM 2015 - XIII International Conference on Computational Fluid Dynamics and Mechanics</b>	April 13 <sup>th</sup> – 14 <sup>th</sup> , 2015	Venice, Italy
<b>e-health week 2015</b>	May 11 <sup>th</sup> -13 <sup>th</sup> , 2015	Riga, Latvia
<b>EuroPCR - Official Congress of the European Association of Percutaneous Cardiovascular Interventions</b>	May 19 <sup>th</sup> -22 <sup>nd</sup> , 2015	Paris, France
<b>AEPC 2015 - 49<sup>th</sup> Annual Meeting of the Association for European Paediatric and Congenital Cardiology</b>	May 20 <sup>th</sup> -23 <sup>rd</sup> , 2015	Prague, Czech Republic
<b>iCi 2015 - imaging in Cardiovascular interventions</b>	June 24 <sup>th</sup> , 2015	Frankfurt, Germany
<b>CSI 2015 - Catheter Interventions in Congenital and Structural Heart Disease</b>	June 25 <sup>th</sup> -27 <sup>th</sup> , 2015	Frankfurt, Germany

<b>FIMH 2015 – 8<sup>th</sup> International Conference on Functional Imaging and Modeling of the Heart</b>	June 25 <sup>th</sup> -27 <sup>th</sup> , 2015	Maastricht, The Netherlands
<b>MCCSIS 2015 – 9<sup>th</sup> Multi conference on Computer Science and Information Systems</b>	July 21 <sup>st</sup> – 24 <sup>th</sup> , 2015	Gran Canaria, Spain
<b>Medinfo 2015 – 15<sup>th</sup> World Congress on Health and Biomedical Informatics</b>	August 19 <sup>th</sup> 23 <sup>rd</sup> , 2015	Sao Paulo, Brasil
<b>EMBS - 37<sup>th</sup> Annual International Conference Of The Ieee Engineering In Medicine And Biology Society</b>	August 25 <sup>th</sup> -29 <sup>th</sup> , 2015	Milan, Italy
<b>ESC 2015 – European Society of Cardiology Congress</b>	Aug 29 <sup>th</sup> – Sep 2 <sup>nd</sup> , 2015	London, United Kingdom
<b>Personalized Medicine 2015 - 3<sup>rd</sup> International Conference on Predictive, Preventive and Personalized Medicine &amp; Molecular Diagnostics</b>	September 1 <sup>st</sup> -3 <sup>rd</sup> , 2015	Valencia, Spain
<b>PICS-AICS 2015 – Paediatric and Adult Interventional Cardiac Symposium</b>	September 18 <sup>th</sup> -21 <sup>st</sup> , 2015	Las Vegas, USA
<b>MICCAI 2015 - 18<sup>th</sup> International Conference on Medical Image Computing and Computer Assisted Intervention</b>	October 5 <sup>th</sup> -9 <sup>th</sup> , 2015	Munich, Germany
<b>AEPC 2016: 50<sup>th</sup> Annual Meeting of the Association for European Paediatric and Congenital Cardiology</b>	May 31 <sup>st</sup> -June 4 <sup>th</sup> , 2016	Rome, Italy
<b>As part of the AEPC 2016 edition, two dedicated slots are being planned. One Mannheimer lecture on ‘Innovation in Paediatric Cardiology’ by Dr Anthony Chang and a special session on the ‘Future of Decision Support Systems in Paediatric Cardiology’, led by Prof. Giacomo Pongiglione, where Cardioproof outcomes will be a key topic .</b>		

## A plan for the use of social networks

As the project enters in its core phase, with the clinical trials for the simulation of the effectiveness of the available models, the interest by the clinical community (as well as of the entire VPH community) is likely to increase. For this reason, we are aiming to encourage the open discussion and the debate on the results and possible implications, as well as on limits and perspectives of the VPH models, by arranging some sort of “virtual place of discussion”.

These discussions will be promoted and conducted using social networks: as a matter of fact, Social media platforms represent a distinct opportunity for the dissemination of project outcomes, particularly as the nature of social media allows us to deliver information both to the general public and disease specialists at the same time.

After a preliminary scoping of the opportunities, it can be said that great opportunities exist but deeper research is needed to reach target audiences (e.g. on LinkedIn alone there are more than 600k European healthcare professionals). Furthermore, social networks provide the opportunity of assess and quantify the success of a specific dissemination initiative or in connecting to the targeted audiences (feedback; retweets, answers).

We have considered the following opportunities:

LinkedIn: LinkedIn is the most popular social networks for professionals, and the Consortium could use it in two ways: 1) having prepared advertisements and defined the target audiences, with LinkedIn Advertising it is possible to optimise ad spend by targeting individuals with specific job titles, at companies and in defined regions. 2) by exploiting LinkedIn's potential as a powerful online engagement opportunities for sector specific awareness building and engagement, CARDIOPROOF can promote a specific group launching polls and discussions on specific topics.

Besides LinkedIn, Twitter could also be a good means for dissemination and for launching a discussion on specific topics: Twitter is now so vast that every niche sector or group imaginable is present in some form. For Twitter, the strategy could be to :

- I. Define target words and phrases
- II. Gather data on conversations, individuals and organisations
- III. Develop content strategy and engage

Finally, beyond the largest networks, the Consortium aims to look at the specialised social hubs, forums and networks used by specialists within target fields. These represent a direct opportunity for engagement, which would also allow for a different level of involvement (by engaging in an ongoing dialogue, not prompting simple advertising opportunities).

### Networking initiative with other VPH projects

Besides the close cooperation with MD-Paedigree for the implementation of a common platform, a cooperation with the VPH-Share project has been started. A preliminary discussion on this topic has been made with the Coordinator of VPH-Share, namely Prof. Rod Hose from the University of Sheffield (who is also involved in MD-Paedigree).

As stated in the brief description of the website ([www.vph-share.eu](http://www.vph-share.eu)), VPH-Share's main objective is to facilitate the rapid construction of personalised biomedical models and simulations to assist diagnosis and treatment, by providing the essential tools,



### Audiences

The image shows three screenshots of LinkedIn's audience targeting interface. Each screenshot displays the 'Estimated Target Audience' and 'Location' (Europe) for a specific job title. The first screenshot is for 'Pediatrician' with 1,391 members. The second is for 'Medical Doctor' with 28,221 members. The third is for 'Medical Technologist' with 1,780 members. Each screenshot also shows a list of related job titles that can be selected for targeting.

Job Title	Estimated Target Audience (LinkedIn Members)
Pediatrician	1,391
Medical Doctor	28,221
Medical Technologist	1,780

services and computational infrastructure to meet the needs of the whole Virtual Physiological Human community.

Therefore, it is expected that CARDIOPROOF will benefit from this cooperation, taking from the VPH-Share framework and experience useful tools on which to build upon.

## Dissemination materials

### Cardioproof logo

Figure 2 shows the Cardioproof logo, which was presented to and agreed by the project partners at project kick-off meeting.



Figure 2 Cardioproof logo

### Presentation templates

#### UPDATES

Figure 3 and **Errore. L'origine riferimento non è stata trovata.** show the new presentation templates to be used when representing the project at conferences and other events.0

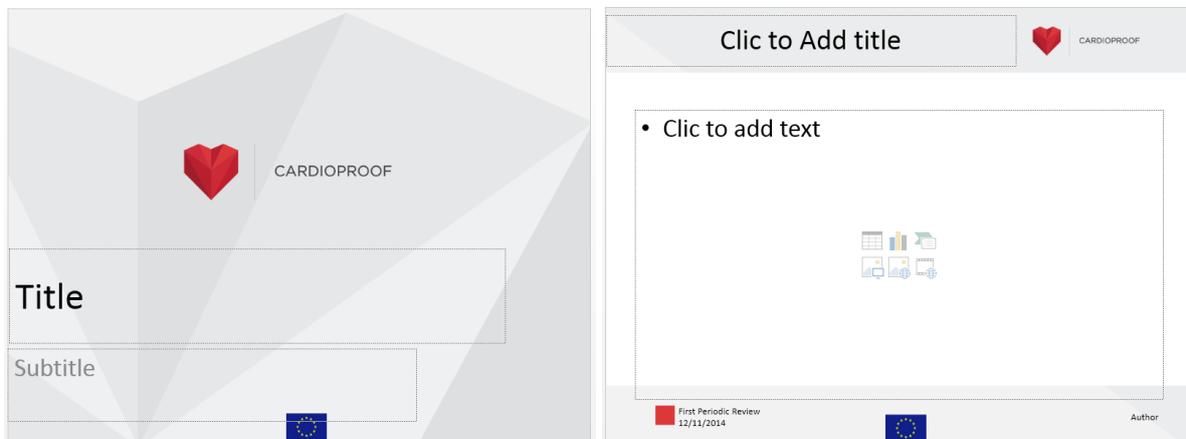


Figure 3 Cardioproof presentation template

### Newsletter

The Cardioproof consortium will publish an annual newsletter, which will be posted in the public area of the project's website, reporting on the main results achieved and also containing relevant news in order to make it attractive to the informed reader and the general public. The Newsletter will also be made available for e-mail distribution to interested parties.

#### UPDATES

### The First CARDIOPROOF Newsletter

The first CARDIOPROOF Newsletter was published through the project website in November 2014.



Figure 3 Newsletter Front Page

In the first issue, the Newsletter introduces the project, the main objectives and methodology, together with some results from the first year of activity, as presented during the internal review held in Rome on 17<sup>th</sup>-18<sup>th</sup> of September.

Moreover, the Newsletter focuses on some specific challenges from the first year of the project, with more in-depth articles explaining some of the more significant achievements of the first 12 months of activity.

Furthermore, the Newsletter has a specific section dedicated to the presentation of the partners.

Finally, a section about forthcoming events and dissemination initiatives/opportunities is included.

## Press Release

A press release was been prepared for the project start and disseminated to mainstream and scientific media outlets.

## Project Poster

A poster summarising the Cardioproof has been produced and is shown in Figure :



Figure 4 Cardioproof at a glance

## Project website

During the first month of the project, the first version of the project website ([www.cardioproof.eu](http://www.cardioproof.eu)) was released online. The website currently contains, in the horizontal menu, sections entitled:

- About

- Overview on the project
- Primary Objectives
- Clinical Challenge
- Clinical Impact
- Comparative Cost Effectiveness
- **News & Docs:**
  - Project News
  - Documents
  - Newsletter
  - Links
  - Related Projects
- **Activities:**
  - Achievements
  - Work in Progress
  - Conferences and Events
- **Partners**

In the home page, besides two banner which link respectively to the About Section and to a Prezi presentation of the Project, there are three further sections:

- LATEST NEWS
- Project News
- Events

Furthermore, in the internal pages, a plug-in of the Eu\_eHealth Twitter account and a EC RSS Feed have been activated.

At this point of the project, many sections are still under construction and the structure of the website itself is still to be considered as non-final, as it will evolve according to varying needs in the course of the project.



Figure 5 The Cardioproof website home page

## UPDATES

### Updates to the Website

Some minor updates of the Website have been implemented: a Private Area has been set up, to allow exchanges of documents amongst the partners of the consortium and also relevant external stakeholders, and a Deliverables section has been added, to archive all the deliverables, also in view of making them this way easily available for the EC Reviewers.

Both these sections are protected by password, and therefore cannot be reached by the general users of the website.

Two links to the CARDIOPROOF Infostructure and Database have been added in the Translational research section.

We are currently assessing the options for setting up a discussion forum to work either in parallel to or as a mirror of the activity on social networks.

### The ID CARD

The ID card was published through the website (in the Project News section). It is a single page (double sided) that explains the project objectives and introduces the consortium. It will be used in the forthcoming dissemination events as generic dissemination material, to provide all types of audience with a brief introduction to the project.

**CARDIOPROOF**

**Proof of Concept of Model-based Cardiovascular Prediction**

**ID CARD**

**CARDIOPROOF** is a project which aims to determine the applicability and effectiveness of predictive modelling and simulation tools for cardiology, validating them in interrelated clinical trials conducted in three European centres of excellence in cardiac treatment (from Germany, Italy and the UK).

**Validating the tools developed in former VPH projects**

Previous Virtual Physiological Human (VPH) efforts developed some powerful tools for computer-based modelling of various cardiovascular (CV) diseases, raising significant expectations to make such tools available for early diagnosis and for predicting disease behaviour and evolution as well as treatment outcomes. As yet, however, the translation into a routine clinical environment has remained challenging and substantially hindered. In fact, despite an increasing interest from the medical community to apply VPH concepts to the field of CV diseases, limited results have been achieved so far.

For this reason, the European Commission has funded with €4,107,000 the Project **CARDIOPROOF**, which aims to overcome knowledge and technology gaps (with specific regard to validity and usability of the existing VPH tools, and comparative effectiveness of VPH-rooted methods and traditional methods) by applying advanced VPH modelling methods in clinical trials of patients with aortic valve disease (AVD) and aortic coarctation (CoA).

**Focusing on two diseases with significant social impact**

Aortic valve disease (AVD) and aortic coarctation (CoA), if left untreated, can cause irreversible heart failure. As a result, treatment becomes mandatory, but optimum timing and the best type of treatment still remain difficult to determine.

With more than 50,000 interventions per year within the EU, the diseases addressed by **CARDIOPROOF** have a significant socio-economic impact. Present clinical guidelines are highly complex and rely mostly on imaging diagnostics and clinical parameters, without benefiting as yet from patient-specific disease modelling based prediction tools. **CARDIOPROOF** goes beyond the current state of the art by conducting validation trials aimed at covering and comparing the complete spectrum of cardiovascular treatment, predicting the evolution of the disease and the immediate and mid-term outcome of treatment. Operational clustering is going to provide a seamless clinical solution that applies different modelling methods to realise the potential of personalised medicine taking into account user-friendliness as a key component of clinical usability.

**The main goals of CARDIOPROOF**

Using the modelling methods developed in previous work, the primary objectives of **CARDIOPROOF** are to:

1. Conduct validation trials in patients with AVD or CoA that reflect a real-world approach by covering and comparing the complete spectrum of cardiovascular treatment.

2. Provide first data about comparative clinical and cost effectiveness of VPH approach compared to conventional diagnostic and treatment algorithms.

3. Accelerate the deployment of CV VPH methods by improving their usability and interoperability in the clinical context.

**Enhance usability and interoperability:** **CARDIOPROOF** aims to enhance the role of the physician in the modelling process chain by markedly improving data management, making it possible to access cloud-based central resources and to make use of user-friendly human interfaces.

**CARDIOPROOF and MD-PAEDIGREE**

In addition to the validation of disease modelling, **CARDIOPROOF** will have access to the advanced model-driven digital repository, data curation and simulation tools developed in former VPH projects (such as Health-e-Child and Sim-e-Child) and currently implemented and enhanced in the ongoing MD-PAEDIGREE project.

**Also some secondary objectives can be highlighted with regard to each of the previous points:**

**Prove the validity of model based CV trials:** **CARDIOPROOF** is going to assess the validity of methods that were developed in previous VPH research.

**Provide data about the comparative effectiveness**

Modelling in CoA has already reached a level of maturity that now allows (in addition to testing the method's validity) a focus on measuring the impact on decision-making and costs.

**Keywords:** Aortic Coarctation, Aortic Valve Disease, Clinical Validation, Computer-Based-Modelling, Disease modelling, Model-driven clinical workflows, Predictive medicine, Virtual Physiological Human

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**Partners**

**LYNKEUS**  
UNIVERSITÄT ULM

**SIEMENS**  
gnübila

**Bambino Gesù**  
UNIVERSITÀ PAPIENSA

**Fraunhofer**  
MENS

**LSP**  
LEONARDO SCIENZA E ECONOMIA VIA FELICIA SCIENZA 1

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Figure 6 Cardioproof ID CARD

## Publications

The following scientific journals have been identified the most appropriate places in which to publish the work performed within Cardioproof:

- Heart Rhythm [Elsevier]
- Cardiovascular Research [Oxford Press]
- Journal of Computational Physics [Elsevier]
- Transactions on Biomedical Engineering [IEEE]
- Journal on Scientific Computing (SISC) [SIAM]
- Journal of Computer Science and Technology – [Springer]
- American Journal of Physiology [HighWire Press]
- Circulation – Biomedical Engineering [American Heart Association Press]
- Journal of the American College of Cardiology [JACC Foundation]
- European Heart Journal [Oxford Press]
- Frontiers in Physiology [Frontiers Media S.A.]
- Medical & Biological Engineering & Computing [Springer]
- International Journal of Advanced Robotic Systems [InTech]
- Computer Methods in Applied Mechanics and Engineering [Elsevier]
- *Computational Analyses*, Medical Engineering & Physics [Elsevier]

**UPDATES**

**Updated list of publications**

Partner	Type of activity (workshop, conference, publication, etc.)	Title of the event/publication	Date	Location/dissemination channel	Role (speaker, exhibitor, author, etc.)	Type of audience
LYNKEUS	Publication	<i>Innovation and Big Data</i> , chapter in the Book "How Knowledge Transfer Changed Biology, Medicine and Health Care", WILEY, 2014, published for the CERN 60 <sup>th</sup> Anniversary.	February 2014 (submitted)			
DHZB	Conference	7 <sup>th</sup> World Congress of Biomechanics, Oral presentation "MRI-based CFD of Aortic Coarctations: Ready for Clinic?"	07.10.14	Boston/USA	Speaker	Biomedical engineers and medical doctors
MUG	Conference	35 <sup>th</sup> Meeting of the Heart Rhythm Society Poster presenter (1): "Electrotonic loading significantly modulates effective refractory period dependent on local structural heterogeneity" Poster presenter (2): "Comprehensive Measures of Left Atrial Wall Thickness derived from Cardiac Computed Tomography"	6.5-10.5.2014	San Francisco, CA, USA.	Author, Poster presenter	Biomedical Engineers, Cardiologists, Basic Researchers in cardiac electrophysiology
MUG	Workshop	Workshop at the Mathematical Biosciences Institute on	16.3.-22.3.2014	Columbus, Ohio, USA.	Speaker	Biomedical Engineers, Basic Researchers, Image Processing

		“Integrating Modalities and Scales in Life Science Imaging”.				Experts, Mathematicians
MUG	Conference	7 <sup>th</sup> World Congress of Biomechanics, Poster presentation “Parallel Simulation of Cardiovascular Tissues - Scalable Multigrid and FETI Methods”	5.7-11.7.2014	Boston/USA	Poster Presenter	Biomedical engineers, Mathematicians and Medical Doctors
MUG	Conference	Annual Meeting of the Austrian Society of Biomedical Engineering. Oral Presentation: “High Performance Simulations for Cardiac Electro-mechanical Models”	19.9-20.9.2014	Hall, Austria	Speaker	Biomedical Engineers
MUG	Conference	Annual Meeting of the Austrian Society of Biomedical Engineering. Oral Presentation: “Multiscale Multiphysics Modeling of Total Cardiac Function: From Basic Science to Clinical Applications”	19.9-20.9.2014	Hall, Austria	Speaker	Biomedical Engineers
MUG	Conference	Annual Meeting of the Austrian Society of Biomedical Engineering. Oral Presentation: “Predicting Response to cardiac Resynchronization Therapy through Computational Modeling”	19.9-20.9.2014	Hall, Austria	Speaker	Biomedical Engineers
MUG	Conference	Annual Meeting of the Austrian Society of Biomedical Engineering. Oral Presentation: “Scalable accelerated iterative solvers for Cardiac Electromechanics”	19.9-20.9.2014	Hall, Austria	Speaker	Biomedical Engineers
MUG	Invited Talk	Monthly seminar at the KTH University. Oral Presentation: “Strongly Scalable Parallel	18.8.2014	Stockholm, Sweden	Speaker	Biomechanical Engineers, Mathematicians.

		Simulations of High-resolution Models in Computational Cardiology”				
MUG	Conference			Halifax, Canada	Speaker	Biomedical Engineers, Basic Researchers, Medical Doctors
MUG	Summer School	Lecture: “Computational Modeling of Cardiac Electro-mechanics”		Beijing, China	Speaker	Mathematicians, Computational Modellers.
MUG	Publication	“Simulating photon scattering effects in structurally detailed ventricular models using a Monte Carlo approach”		Journal, Frontiers in Physiology	Author	Basic Researchers.
MUG	Publication (submitted)	“Anatomically accurate high resolution modeling of human whole heart electromechanics”	2014	Biomechanics and Modeling in Mechanobiology	Author	Basic Researchers, Biomechanical Engineers, Computational Modelers.
ESI	Conference	SPHERIC workshop (on SPH methods) paper in proceeding	June 3-5, 2014	Paris	Speaker/author	SPH community
MEVIS	Publication, Movie	Image-based Interactive Assessment and Therapy Simulation of Aortic Coarctation	<b>Aug 18, 2014</b>	Youtube Channel: <a href="https://www.youtube.com/watch?list=PLKFE5Y3nEq7HBd1N_h2_bptnoEfUooy9o&amp;v=V0lqfCTmab4#t=16">https://www.youtube.com/watch?list=PLKFE5Y3nEq7HBd1N_h2_bptnoEfUooy9o&amp;v=V0lqfCTmab4#t=16</a>	Publisher	Visitors of the Fraunhofer MEVIS website, people looking for related topics on youtube
MEVIS	Workshop Demo	Image-based Interactive Assessment and Therapy Simulation of Aortic Coarctation	Sep 14, 2014	Workshop on interactive	Author/Presenter	Medical imaging researchers and the user community of clinicians, neuroscientists, and biologists

**D.10.1** Dissemination and exploitation strategy plan and preliminary materials

CARDIOPROOF - FP7-ICT-2013-10 (611232)

				medical image computing at MICCAI 2014 ( <a href="http://interactivemedical.org/imic2014/">http://interactivemedical.org/imic2014/</a> )		
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