



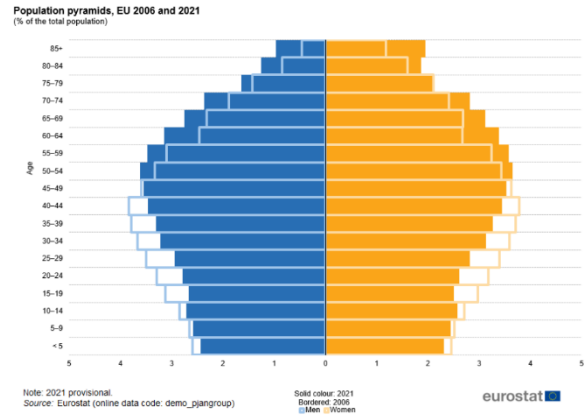
RITMOCORE
Innovation for a healthy heartbeat

Handbook and lessons learnt (July 2022)



What is the problem addressed by RITMOCORE?

The graph shows the **progressive ageing of the European population**, from 2016 to 2021. In a scenario where Europe is facing an increasingly top-heavy population structure in the coming decades, an urgent question is posed to healthcare systems: **how to safeguard the quality of care in a setting where demand will continue to rise while resources remain stagnant.**



In the pacemaker market, the ageing of the population translates directly **into an increase in the demand for pacemakers** and for **professional resources**. The situation prior to the COVID-19 pandemic was defined by the prevalent procurement strategy, where procurers would seek to reduce the price per device by aggregating purchases. While this approach has the short-term benefit of reducing the price per pacemaker, it also has the side effect of misaligning the interests of stakeholders.

On the one hand, in a **price-based market**, pacemaker manufacturers are not motivated to invest on innovation, but rather to reduce their manufacturing costs, thereby **offering hospitals a lower range of pacemakers** than current technologies afford – and what they do invest on innovation is not attuned to the needs of the patient care pathway. On the other hand, clinicians seek to offer the best care to patients, and watch with frustration how the more **advanced technologies available in the industry do not end up in their operating rooms**. Hospital management, on their part, are constrained by **annual budgets**, which do not consider longer term benefits of higher range pacemakers (such as durability). The situation creates a series of growing tensions – between clinicians and hospital management, and between hospital management and suppliers – and a dangerous disassociation between the procurement process and the welfare of patients.

Important to consider that managing a potentially overloading amount of data generated by the newest pacemakers is a technical issue that must be considered.

“The steady growth of the demand, mostly due to the ageing population, and budgets resistance to follow such demand makes think the time for transformation is here. Sustainability is at risk.”

At the same time, a technology first introduced in the pacemaker market around 2010 has been gaining traction and become increasingly available in the pacemakers accessible to hospitals: **remote monitoring**. Remote monitoring has enormous potential in preventing exacerbations and hospitalisations, which is the most expensive of healthcare resources. Data gathered through remote monitoring can help in research towards better, more efficient treatments, and empower patients towards self-care and self-management. The technology also drastically reduces the need to travel for consultations, with obvious advantages during a pandemic and an energy crisis.

But remote monitoring also requires **challenging organisational changes from hospitals**; staff needs to be trained to deal with non-clinical ICT-related issues; each pacemaker manufacturer has their own web service, noninteroperable with each other, and gathering non-normalised data, creating a chaotic web of different applications; hospitals have trouble billing public healthcare systems for daily consultations in which patients aren't involved. A telling result of these barriers is that, a decade after the technology is introduced, only 10% of pacemakers implanted in Spain are remotely monitored.

“There is a misalignment in the interest of current stakeholders, which means there is room for improving efficiency”

In this context, RITMOCORE has designed and developed a new model of treatment for patients in need of a pacemaker, this model has been developed through a Public Procurement of Innovative Solutions (PPI) and has been adopted and validated in 3 Hospitals. It has been measured to generate evidence on its advantages. RITMOCORE started from the current budget used in hospitals to purchase pacemakers. With this budget, the support of the EC funding, strong political and personal commitment to transform care pathways, it moves to purchasing of services instead of devices. Ultimately RITMOCORE aims to provide an enhanced experience to patients.

RITMOCORE MODEL is a comprehensive care model for patients with a pacemaker implant, including the full portfolio of several brands of pacemakers, remote monitoring, coordinated care, and patient activation.

How did RITMOCORE implemented?

Public Procurement of Innovative Solutions (PPI)

RITMOCORE was set up in 2016 with four hospitals joining the buyer's group summing up a total tender budget of €25 million. The tender preparation period marked a rich co-creation period between the clinicians and procurement professionals of the four hospitals, and the knowledge partners supporting the project.

Public Procurement for Innovative Solutions (PPI) projects provide public procurers in Europe with a legal and financial vehicle to incentivise the industry into bringing innovative solutions to the market. By gathering a critical mass of purchasing power on the demand side (a few large enough hospitals in RITMOCORE's case), the industry can be incentivised into providing the solutions the procurers need, with the price and quality requirements for large scale deployment.

The RITMOCORE Model has been consolidated by the experience.

Overall, the RITMOCORE model has satisfied the expectations of all participant stakeholders, except for the non successful lot.

- ✓ Clinical results have **overcome expectations**.
- ✓ The alignment in the clinical pathway of all participant stakeholders has increased efficiency, and effective and active coordination with primary care has been established.
- ✓ The **improvement in patient experience** has been largely satisfactory.
- ✓ The participation in the tender process confirms the acceptance by the industry of the need to evolve to new service provision models.
- ✓ The satisfactory **operational deployment** validates the governance model.
- ✓ And the results of the judicial appeal confirm the **legal validity of the proposed purchasing model**.
- ✓ The effective and efficient role of the ACRM to deal with the extra work and data overload that remote monitoring implies has been validated.

The buyers group

The team of Hospitals composing the RITMOCORE purchasing group comprises a diverse range of characteristics including **public and private entities**, from highly specialized to community hospitals, from full digitally integrated healthcare to non-interoperable IT and organic system:

- There are **public Hospitals**, like Liverpool Heart and Chest Hospital (LHCH), and Hospital Universitari de Bellvitge (HUB), and others offering public services but privately managed, like Hospital de Sant Pau (STPAU) or Fundació Assistencial Mútua de Terrassa (FAMT).
 - LHCH, STPAU and HUB are **tertiary Hospitals** with a large reference area, while FAMT is a community hospital.
 - LHCH is a highly **specialized Hospital**, FAMT include all specialities but not all highly complex procedures, while STPAU and HUB comprises all specialities with high complex procedures and for some of them offering tertiary support to other Hospitals.
- HUB, and FAMT are integrated in managerial, budgetary and ICT structures which are also responsible for Primary Care. While STPAU and LHCH relates with diverse referring Hospitals and Primary Care centers not included in the same hierarchical organization. This situation creates a very different starting point in terms of scope for the implementation of the coordination of care.

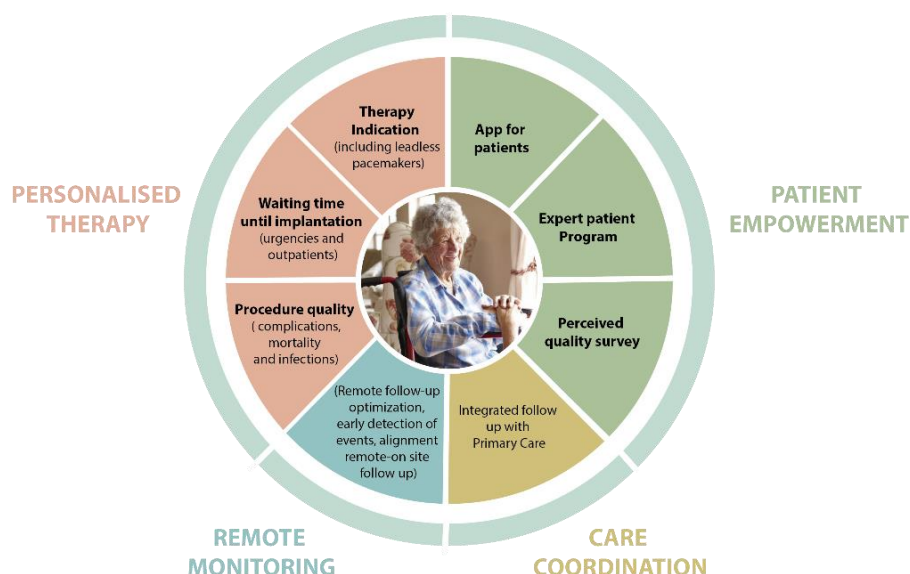
AQuAS, VALDE Innova, and SmartHomes acting as knowledge partners completed the RITMOCORE team.



Awarded bidders



The proposed solution: RITMOCORE care model



Who is the target group? Target patients are people with symptomatic bradycardias, these patients are usually treated with an implantable pacemaker. The average age of these patients at implant is around 75 years old and 50% are more than 80 years old, frequently with multiple comorbidities. The pacemaker is an electronic device that triggers heart beats by applying electrical impulses directly to the heart muscle.

Clinicians, working closely with procurement experts and knowledge partners, used the core pillars of RITMOCORE shown in figure above to organize the RITMOCORE care model and the definition of the support-service each hospital requires from its supplier:

✓ **Personalised treatment** is the provision of treatment that best suits each individual patient. This requires the hospital having available a complete and updated range of pacemakers from different manufacturers throughout the duration of the contract, allowing the selection of the device best suited to each patient. This means that the supplier will need to close commercial agreements with its competitors so that it can offer the hospital a catalogue of pacemakers that includes a complete portfolio.



**PERSONALIZED
ARRHYTHMIA
THERAPY**

✓ These pacemakers need to offer the possibility of **Remote Monitoring**. In supporting the hospital to deal with time-consuming non-clinical aspects of remote monitoring, the supplier is required to develop an Assistance Centre for Remote Monitoring to collect and review ALL transmissions and classify them according to a colour-based alert level system, ensuring that monitoring data is always accessible in a transparent, complete, and exploitable manner by hospital staff. This means that the supplier also needs to develop an information system to administer all these data; the information system should be able to interoperate with the electronic health record of the hospital and should be able to integrate information from any manufacturer.



**REMOTE
MONITORING**

✓ The objective of **Coordinating Care** is to allow all different levels of care involved in patients' treatments (not only in the referral hospital, but in referring hospitals and in primary care) to have access to relevant data on patients' health status that is validated by the referral hospital, thereby helping assign healthcare resources more efficiently by transferring to primary care all routine follow-up. The supplier's information system needs to be able to support the care coordination plan designed by the hospital.



**COORDINATED
CARE**

✓ The supplier is also expected to assist the hospital in its **Patient Activation** programme, designed to empower patients and improve the patient experience with support and information, increasing their safety-awareness and self-control in the treatment of the condition.



**PATIENT
ACTIVATION**

All these pillars are enabled by:

- **Change Management** is key to supporting the process of implementing the RITMOCORE model in each hospital.
- **Risk-sharing contract** including value-based procurement (outcome-based payments), pay per population, pay per services not per devices, and financial participation in complications (page 6).

The RITMOCORE Risk Sharing contract

The RITMOCORE Risk Sharing service contract is based on an innovative payment schema, and it is the most disruptive enabler for the model

Pay per services not per devices

Pay per population not per activity

Outcome based payment

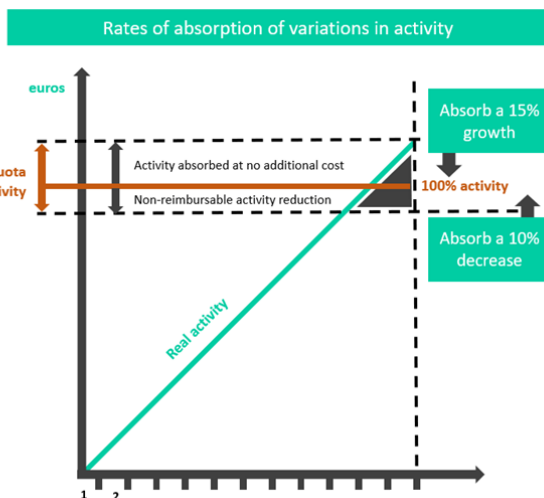
Participation in the economical consequences of complications

Pay per services not per devices

The shift from **purchasing devices** to **purchasing services**, which allows the acquisition of all missing elements for the public health-care system, facilitating a quick deployment supported by existing budget items, and focusing on outcomes which are additional to those achieved from devices. Services are expected to be extensively supported by advanced ICT systems which will make them feasible.

Pay per population not per activity

Absorption rates on activity are important for clinicians because it frees them from being limited or dictated by a pre-set number of devices that must be implanted in a year. Because procurement is done according to yearly budgets, hospitals or care centres usually put pressure on clinicians to conform to certain yearly parameters; **risk-sharing relieves this pressure** within the parameters of the agreed absorption rates.



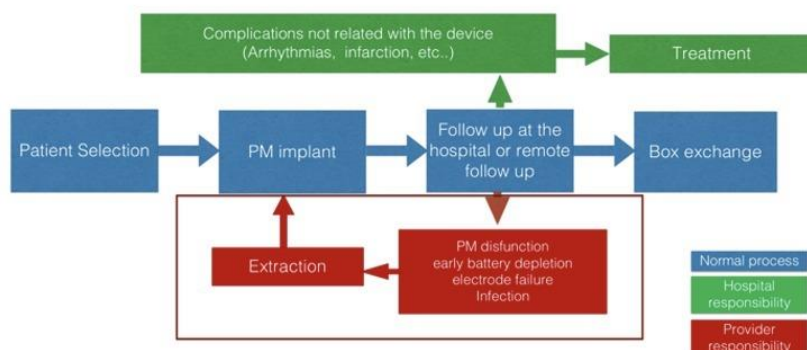
Outcome-based payments

A percentage (5% for the first year) of payments to suppliers is made dependent on meeting a set of clinical indicators.

These **indicators** are designed to ensure that the **service provision** is oriented towards obtaining the **outcomes** that best represent the interests of patients; they are based on the patient-centred outcome measures developed by the International Consortium for Health Outcome Measures (ICHOM).

Participation in economical consequences of complications

The **commitment** from the Industry, the **engagement** from the early beginning and a **risk sharing** model leads to risk forecasting and cost control and assumption.





PERSONALIZED ARRHYTHMIA THERAPY

Biotronik has provided a catalogue of pacemakers integrated by its own devices, and by those offered by Abbott and Medtronic.

In very small percentage of cases, the Technical Boards have supervised the inclusion of pacemaker models for clinical interventions with requirements that could not be met by pacemakers in the existing catalogues.

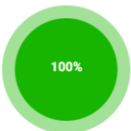


REMOTE MONITORING

More than 93% of patients implanted with pacemakers during the first year of the project are being remotely monitored. The target KPI for this was $\geq 60\%$; the result is well above that. The fact that RITMOCORE was being implemented slap-dash in the middle of a pandemic meant clinicians were doubly aware of the relevance of this technology and there was a conscious push towards increasing the percentage of remotely monitored pacemakers. Patients, on their part, were more receptive to the technology. Nursing staff report that patients tend to be in awe of the technology. All hospitals have detected abnormalities, such as atrial fibrillation, which has prevented patients from a high risk of stroke.

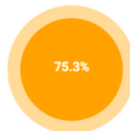
PT1 Rate of pacemaker implantation indication according to current European clinical practice guidelines

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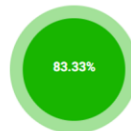
PT2 Achievement of the leadless pacemaker implantation rate according to the offered volume

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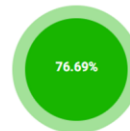
PT3 Waiting time from pacemaker indication to implantation ≤ 2 working days in hospitalized patients with a temporary pacemaker electrode

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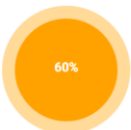
PT4 Waiting time from pacemaker indication to implantation \leq target number working days in admitted patient without temporary pacemaker electrode (3 days)

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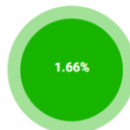
PT5 Waiting time from pacemaker indication to implantation in outpatients

18 / 30



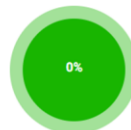
PT6 Major complication at 90 days after implantation

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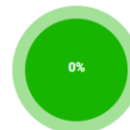
PT7 Implantation related death, at 30 days

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PT8 Device infection rate at 3 months after implantation

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Clinicians from hospitals report that the most important result has been the **ability to develop a follow-up** much closer to patients.

Nurses from primary care and specialised care have created a direct communication channel.

Patients receive feedback on the result of the monitoring through their mobile devices. They can contact a human voice when are in doubt. They **received tailored information** about their pathology and their pacemaker. The expert patient program facilitates mutual learning between peers. The result is increased peace of mind and better self-care.



COORDINATED CARE



PATIENT ACTIVATION

It is important for the **industry** to realise that **their role in the pacemaker implantation care pathway** can go **far beyond** putting a stock of materials in the hospital, but that it can grow to **include participation** in almost every task related to the management of patients and their care.

This increased participation and flow of communication can improve the entire service provision.

BENEFITS FOR THE PATIENT AND THEIR FAMILIES

- ✓ Reduction in complications related with pacemakers' implantation.
- ✓ Best care offered with available resources.
- ✓ Remote monitoring allows an increased follow up frequency including automatic alarms. It allows an earlier identification of problems related with any miss functioning of the pacemaker and also with the appearance of other pathologies.
- ✓ Patients do not need to go to Hospital. It could imply saving long distance transportation and/or support from informal carers during working hours (reducing absences).
- ✓ Patient activation program to better deal with the psychological impact and self-care, and availability of an App for direct communication. All these increases the patient experience.
- ✓ Immediate feedback on monitoring results.
- ✓ Active follow-up, better control of patients, lower risk of non-detected complications or premature battery depletion.
- ✓ More activities for patient activation such as participation in patients' networks (Expert patient in Catalonia), or dedicated multimedia material for education.

BENEFITS FOR THE CLINICIANS

- ✓ Less time invested in non-productive activities. More time for added value consultations with patients
- ✓ Improved procedures in a patient centered approach, which reduce complications
- ✓ More options for providing high quality care. Full portfolio of at least two brands from which to select most adequate device per patient
- ✓ Extended technical support
- ✓ Integrated unified interface among all brands
- ✓ Extra resources for alert management
- ✓ More available data from patients for clinical practice and research (anonymized)

BENEFITS FOR PRIMARY CARE

- ✓ Empowerment of general practitioners and nurses.
- ✓ Direct communication with specialists.
- ✓ More comprehensive view of patient's condition.

*"If I ever need a
pacemaker, I want it to be
under RITMOCORE"*

*Mireia Barroso, Head of Procurement
Hospital Sant Pau*

Organisational and management results

The quality indicators gathered for the project and their incorporation in **the new Data Integration Platform** have allowed the hospitals to obtain data describing many aspects of the care pathway for the first time. This allows them to enact changes in the pathway towards the optimization of these indicators in the coming years.

The partnership of HUB and STPAU with Biotronik along the entire care pathway, and the co-design of the Data Integration Platform, has allowed the hospitals to integrate the entire care process.

BENEFITS FOR THE PUBLIC HEALTH SYSTEM AND/OR THE HOSPITAL

- ✓ **Long term increased sustainability.** This is a critical motivation for Hospital to adopt and validate the RITMOCORE model. When clinicians start to suffer an overload that prevent them from offering high quality healthcare, and Hospital managers refuse to increase human resources, it is time to change. The new balance between resources and care demand has no place for inefficiencies. Increasing alignment among stakeholder implies reducing inefficiencies.
 - **Evidence on cost-effectiveness** of remote monitoring is growing, including reduced costs in ambulances
 - **Earlier identification** of battery replacement need could reduce the replacement in urgencies, and delay battery replacement, reducing the days in hospital of patients and allowing better procedure adjustment, all contributing to increase patient wellbeing and costs reduction.
 - The **use of the advance features** of some pacemakers, with remote monitoring and an effective coordination of care, could contribute substantially to the prevention of some conditions, as for example stroke and apnoea.
 - Transferring **face to face visits to Primary Care** contributes to reduce the burden of the specialist and increases the capacity of GPs to have a comprehensive view of the patient.
 - High-cost device related complications **co-supported by supplier** if it is its responsibility.
- ✓ **Fix rate per population:** This is a critical component of the model that influences not only the long-term sustainability, but also it reduces budgetary tensions minimizing fluctuations.
- ✓ **Agile deployment of advance services digitally enabled:** Servitisation of medical devices allows to shape advance care services in a quick and efficient way. Hospitals or Health care responsible don't need to put in place or to adapt existing IT systems, budget items, or internal procedures, which are usually hard to move, to validate new care models. The resources not available in each Hospital to build the desired care model, could be complemented by service providers. Industry uses to be more agile than public services to implement changes, and to support them.
- ✓ **Pay per outcomes:** This model is in the trend of value-based health, a shift to explore public-private partnerships to foster alignment and efficiency for best care possible.

BENEFITS FOR THE INDUSTRY

- ✓ **Known budget in long-term contracts**, less uncertainty and commercial efforts.
- ✓ The **innovation ecosystem is reinforced**, with increased close experiences and available data.
- ✓ **Participation in Co-decision** boards, partnership role with Hospital.
- ✓ **Empowerment of local representatives of manufacturers**, with enhanced activity, not only sales representatives but service providers. Increased added value for local suppliers.
- ✓ **Opportunities of partnership** for innovative SMEs.
- ✓ Moving from low-price competition to **value-based competition**.
- ✓ **Empowerment and training of primary care physicians** may be a driver to increase referrals and pacemakers demand. The lack of trained primary care physicians in Spain could be one of the reasons of the lower penetration in comparison with Europe .

“RITMOCORE model was based on an intense work of co-creation between clinicians and consultants”

The innovation drivers

VALUE BASED HEALTH

Value-based healthcare programs are vital to a larger quality strategy to **reform how healthcare is delivered and paid for**. Value-based care supports the triple-aim of providing better care for individuals, better health for populations, at a lower cost.

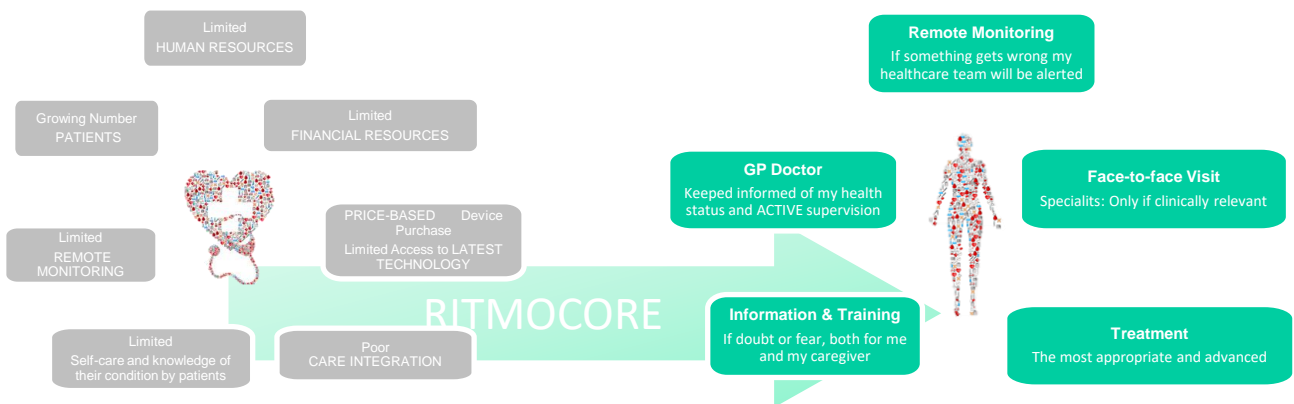
RITMOCORE is implemented through a value-based procurement contract, where payments to suppliers is made dependent on meeting a set of clinical indicators.

PATIENT ACTIVATION AND PATIENT EXPERIENCE

Patient activation and patient experience is not only about addressing clinical needs but **also mental peace and wellbeing**.

Educating the patient and activating the patients' **networks** are key components.

Patients need to be informed and updated on results through a **direct contact** with clinicians to assure the continuity of the care path at all stages.



SERVITISATION - PARTNERSHIP

Servitisation enables the quick implementation of complex changes in rigid structures as hospitals, which lacks flexibility to incorporate new profiles, to open new budgetary items, or to modify existing IT systems.

In RITMOCORE servitisation was achieved by looking to **buy outcomes instead of products**. This fact facilitated a quick deployment supported by existing budget items and focusing on outcomes which are additional to those achieved from devices. Services are expected to be extensively supported by advanced ICT systems which will make them feasible.

This change converted the industry from mere suppliers to partners resulting in a long-term **partnership**.

PATIENT CENTERED CARE

Patient-centered care focuses not only on the patient's diagnosis but also on the person. Not only clinical outcomes are observed, but also the emotional and mental wellbeing and the convenience of treatments.

It fosters **alignment between care levels**, such as primary and specialized care, **empowering primary care** to have a more holistic view of the patient, **increases patient follow-up**, conform and confidence, and liberate time from specialists.

Resulting in facilitating the Hospitals to offer a comprehensive care.

CHANGING THE INDUSTRY VALUE CHAIN AND MINDSET

THE CHANGE RESISTANCE FROM THE MARKET.

RITMOCORE's innovation rests in the disruptive way it organizes the provision of service, and in the prominent role it asks suppliers to play.

In the past, suppliers have been responsible only for dispatching devices and managing their stocks. But by focusing their full service on the patient the care-path can be wholly transformed.

This **re-organization impacts the supply side dramatically**. Not all the companies are prepared or willing to play a new role. It is to be expected that some of them react negatively.

The experience of STOPandGO(*) PPI (where STPAU first purchased services with a risk sharing contract) showed up the industry resistant to change. STOPandGO had demonstrated that the proposed purchasing model is feasible, and so the threat represented by RITMOCORE, an international joint procurement based on STOPandGO purchasing model but more ambitious in size and scope, is not to be neglected.

The **pacemaker industry is inhabited by a small number of players**. Up until now, they have been competing aggressively, yet there is room for everyone. Different suppliers deliver to different hospitals, and they all manage to share the cake.

However, the **new model represented by RITMOCORE is expected to change the current position of the players, fostering collaboration**. The strategies that have proven to be successful in reputed hospitals can easily be adopted elsewhere.

The judicial appeal

The judicial appeal is a symptom of an expected resistance to change in the industry.

When innovation procurement is used as an instrument for transformation, it is to be expected that the industry will react by pleading their case in court, as it was the case in RITMOCORE, where the court's decision backed the project's approach and created the jurisprudence necessary for the scale up of the RITMOCORE model.

Fostering a radical change in the value chain of service providers should be made gradually.

The results of the judicial appeal confirm the legal validity of the proposed purchasing model .

A real partnership

The new model of buying services instead of products implies a change of mind: **The hospital does not get a supplier; it wins a partner.**

In the IT sector this change was accomplished long time ago. The IT provider (serving PC's and printers) became a real partner accompanying companies in their technological journey, implementing office automation first, then network services, uploading to the cloud or developing apps for customers.

The risk-sharing model entails a considerable change in this relationship. Having the provider participate so actively in so many aspects within the hospital, a much more intense level of relationship is established between a larger number of members of each organization's teams.

(*) The STOPandGO project focused on procuring services enabled by available, but not mainstreamed, innovative technology instead of "just" innovative technology.

STOPandGO 'Sustainable Technology for Older People - Get Organised' is a Public Procurement of Innovative Solutions (PPI) project that has received funding from the EU 7th FP under grant agreement no 621013.

"The judicial appeal is a symptom of an expected resistance to change in the industry. Fostering a radical change in the value chain of service providers should be made gradually"

ABOUT the Public Procurement of Innovative Solutions (PPI)

Despite properly implemented in RITMOCORE-PPI, still more actions are recommended by the suppliers during Pre-Procurement stage.

Suppliers suggested to improve the interaction between buyers and suppliers, such the arrangement of more than one meeting/interaction with the clinicians and also with the contracting organ employees in order to solve administrative doubts.

More elaborated validation with the industry of the proposed budget per lot would have been useful to avoid desert lots.

Suppliers call for more support than a Q&A post to fully understand demanded contract and proceed with the bid submission

As a general opinion, the provided information was considerably good, but additional actions could be taken into consideration in the future to support suppliers to present a more competitive offer.

- ✓ From the Buyers' perspective, it is vital for the suppliers to understand the life cycle contracting rules.
- ✓ From the bidders' perspective detailed guides to bid through the Public Procurement Platform would be of interest.
- ✓ Procurement Organisations shall also facilitate and promote the Consortia building.

Integration phase before actual deployment should not be underestimated

In a PPI there will be need of some technology development and integration and it is important to wait until the technology is mature enough to avoid facing unnecessary problems in life clinic. The integration of the Data Integration Platform has led to difficulties that could have been avoided.

Join procurement.

The biggest challenges regarding joint procurement are the disparity of visions, and the divergent past experiences, and cultures and expectations.

The preparation phase has been critical to build cohesion, but alignment within Catalan hospitals has been easier than with LHCH.

It is worth investing efforts in alignment and in a joint development of the model during the preparation phase.

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Procurement units should be ready to go on court, and win!

Resistance to change from the market should be expected and consequently the use of judicial methods to stop or to delay innovation adoption.

Any PPI has to ensure the legality of the whole process, so as to avoid any negative impact carried over from judicial proceedings. RITMOCORE has had the experience in the tendering stage, but it could also come to the evaluation process. Measuring innovation is a complex endeavor, especially when it relies on technicians agreeing on subjective criteria.

Not only is it possible, it is also necessary in order to transform the current model.

ASSISTANCE CENTER FOR REMOTE MONITORING (ACRM)

The remote monitoring of pacemakers opens a twofold situation.

On one hand it allows for **early detection of complications** or undesirable situations and then preventive measures could be adopted.

On the other hand, it creates **a huge amount of data to be analysed**, people need to use technology at home, and they could be unfamiliar with this, and to be effective the proper use must be assured and for that training and problem-solving assistance may be needed.

The **ACRM** is a core component of the RITMOCORE model that makes feasible for the clinician team to concentrate of tasks with clinical value, as the ACRM deals with all the rest.

The ACRM is composed of:

- ✓ **a digital platform** to collect monitoring data
- ✓ **qualified personnel** to analyse these data
- ✓ **a call center** to attend patients doubts or requests.

The call for center was an important part of the collaboration and the low number of calls received from patients and their caregivers has been surprising.

“The call center was an important part of the collaboration and the low number of calls received from patients and their caregivers has been surprising”

DIGITAL TRANSFORMATION

Digital transformation has been on the minds of managers in all sectors, including healthcare, for years. The COVID pandemic has accelerated technology adoption in businesses, including hospitals.

Technology is continually opening up new possibilities for prevention, care and treatment. Digital Transformation is about **setting up a corporate strategy** to deliver more sustainable value to patients, healthcare professionals and the organizations themselves. It stands for leveraging digital capabilities (eg. mobile, cloud, analytics), but mainly focusing on transformation (patient experience, process optimization, data-based decision making).

But technology is an enabler, to make a real Digital Transformation is essential to:

- ✓ Create an **innovation friendly environment** and leadership: Hospitals and related entities managers must be committed to generate a multidisciplinary collaboration.
- ✓ Establish an **alignment with the payers**.
- ✓ Be supported by **drivers for change** such as servitisation, value-based, personalized therapies, etc.
- ✓ Deploy **change management strategies**.
- ✓ Count on **professional project management**: neither the clinical staff nor the manufacturers may be experienced.
- ✓ Setup **multidisciplinary teams** for organisation and management.
- ✓ Attend the **human factor**:
 - Digital gap in elder patients.
 - Rejection to be continuously monitored.
 - Digital approach: Patients and doctors interacting more with digital devices than with actual people.

*“Digitalization is good,
but Digital Transformation is
even better.”*

Jorge González, Ticbiomed

“Efficiency is to be built on alignment of interests for all stakeholders and the use of digital tools”

Hospital centred to patient centred

Procedures and attention to pacemakers patients have been designed according to the hospital needs and convenience. The attention through the different care levels (primary care, specialised care, tertiary hospitals) is not aligned nor coordinated. RITMOCORE aligns the pacemakers’ patient journey with the patient care path, increasing coordination between different care levels.

From purchasing price based devices to long term risk sharing service contracts

RITMOCORE moves from purchasing pacemakers based on a price competition to purchase long term services, which includes pacemakers provision, based on a value competition and sharing risks between providers and healthcare services.

From reactive model to preventive model

RITMOCORE allows early identification of complications and adoption of preventive measures through remote monitoring and coordinated care

“Increasing efficiency along full care path for the best care possible with available resources”

“RITMOCORE is not for short term saving but for long term sustainability”

Product-Evidence-Price to Need-Solution-Value

The traditional approach in the purchase of services follows the sequence from the product, supported by evidence and looking for the best price. The RITMOCORE model aligns with the procurement of value-based innovations starting from the unmet needs to address, identifying the value of addressing the given unmet needs vs. doing nothing up to the development and adoption of the innovation addressing the identified unmet needs and evaluating the real value delivered by the adopted innovation

From paying per number of devices to pay per population

RITMOCORE defines some threshold around an estimation of the foreseen demand based on the existing baseline

From device-based to pathology-based attention

Traditionally the electro-cardiology only treated the patient according to their pacemaker, without a holistic view of the patient. In the same way, the rest of the doctors did not access information related to the pacemakers implanted in their patients. After RITMOCORE the patient experience has been improved and there are now new open channels between professionals to preserve the essential holistic view of the patient.

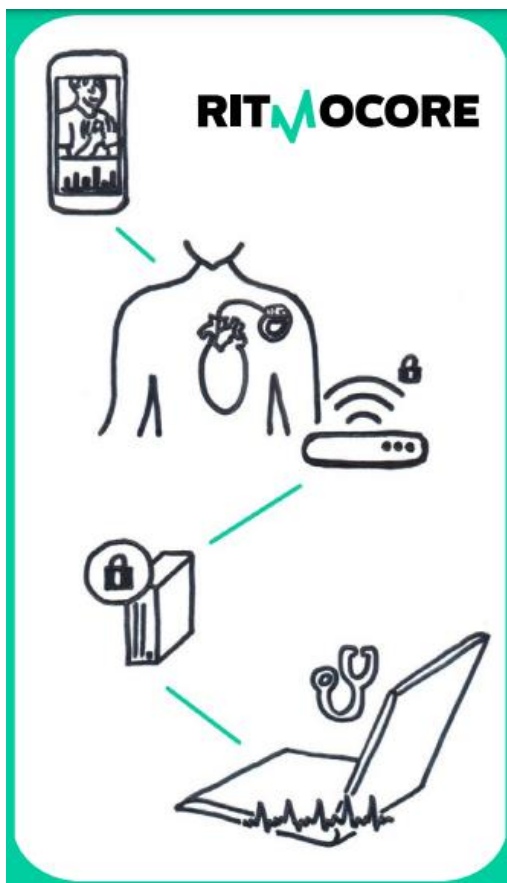
Benefits of RITMOCORE model	
Effectiveness	Efficiency
Better clinical results	Better use of existing
Better Patient experience	resources

Improving the experience of activated patients with an implanted pacemaker

Patients with **bradycardias** being implanted with a pacemaker have non or little capacity of influencing the evolution of this condition. This pathology is not dependent of the habits or behaviour of the patient, it depends on age and/or own anatomy.

For that reason, not known program is empowering these patients, as it would not have an impact on the need of the device.

However, being implanted with a pacemakers usually have a strong impact in the mood and in the emotional wellbeing of patients. Most of pacemakers can be perceived under the skin of patients, so it is not easy to forget about it. And it is a lifesaving device, so it also has a high impact as life changer in the people perception. It also implies some changes in behaviours as for instance patients carrying a pacemakers are alerted ante some security doors.



There are many reasons that creates a feeling of uncertainty and anxiety (*Is it really working well?*) and doubts on what the device really does or how could or couldn't be done.

RITMOCORE addresses these needs of education and peace of mind by several means:

- Tailored education material
- Network of patients
- Accessible contact through the assistant center for remote monitoring
- Remote monitoring for daily follow-up
- Feedback on their mobile phone on the results of the monitoring

This has **radically changed the RITMOCORE patient experience**, specially for those who were implanted some years before RITMOCORE started.

RITMOCORE patients become a member of their own care team, understand what the device can or can't do, and what the changes to be adopted. But most important anxiety is relieved and self-confidence is built.

“Patient anxiety is relieved and self-confidence is built”

Success factors in remote monitoring

Remote monitoring of devices allows **early intervention** to resolve potential problems or complications, which has great advantages for patients and avoids costly interventions for the system. However, the management of data and alarms can overwhelm health services. In RITMOCORE this management has been very successful thanks to the involvement and motivation of the nurses, the good performance of the ACRM and the good coordination between the two care levels leading to a **new patient experience**.

RITMOCORE: Impact beyond the project

Bellvitge opens the first nursing consultation circuit in cardiology (July 2022)

Within the framework of RITMOCORE, one of the main projects for innovative health solutions underway in the EU, the Bellvitge University Hospital (HUB) has implemented an interconsultation service between cardiology nurses and Primary Care nurses

Project GISMAE in Hospital Clinic (Barcelona)

In Hospital Clínic de Barcelona they are implementing project GISMAE, which also seeks to establish a partnership with a cardiac device manufacturer to improve the care pathway of patients implanted with both pacemakers and defibrillators.

The project shares many of RITMOCORE's core principles, but in GISMAE they have also partnered with an institute for cardiovascular studies to use the data gathered from remote monitoring for research towards better treatments.

Biotronik awarded ADELE project

Biotronik España have also been awarded the ADELE project tender, based on RITMOCORE value-based service procurement and have bid for other tenders with smaller volumes of services. These projects have forced them to make certain structural changes, and place permanent team members in the hospitals, and because they are adapting to this model of contracts, it is in their interest to pursue similar opportunities in the future.

Catalunya Expert Patient Program ©

The Catalunya Expert Patient Program®, framed within the Chronicity Prevention and Care Program of the Department of Health, was born in October 2006, in Barcelona, in a chronic disease management project with the idea of promoting the participation of people in their health process. It is based on similar experiences from other countries but with its own methodology adapted to the population and the health system of Catalonia.

It has been extended to patients with a pacemakers in collaboration with RITMOCORE.

LHCH: ARTESIA STUDY

ARTESIA study is an international randomised controlled study comparing the effectiveness of aspirin vs apixaban in stroke prevention. LHCH has also identified 20 or so other patients as soon as they have gone into persistent atrial fibrillation. LHCH has written to their GPs recommending commencement of anticoagulants. This provides early diagnosis, treatment and fulfilment of international guidelines again aimed at preventing strokes.

“RITMOCORE project will pave the way towards a future exploitation of the results generated considering a sustainable upscaling strategy”

RITMOCORE OPENS THE DOOR TO NEW CHALLENGES

Next steps for model improvement

Tenders and long term contracts may not foresee *force majeure situations* such as a global pandemic, or a war with a dramatic change in international supply chain prices.

Holistic vision of patients and data.

Hospitals cannot have a platform and a project for each pathology, they need to standardize the Data Platform.

Monitoring-predicting-preventing

They will continuously be generating so much data that data analytics automation will be necessary.

Industry value chain, business case, and mindset!

The increase in efficiency, the comprehensive approach, the management of an ever-increasing amount of data are going to require new value chains in the industry, new partnerships. But it will not be worth copying those of other industries, the health sector has a very large public component and many regulations.

Reimbursement models

It is necessary to adapt the current reimbursement schema and explore adaptations to the Bismark model.

Change Management

The change from thinking about price to thinking about value requires a new mindset.

The digital transformation of the healthcare sector is mandatory.

Current model are not sustainable, and all related industry is aware. Value based health model is one of the options for this transformation contributing to the long-term sustainability of the healthcare system worldwide.

Digital maturity goes hand in hand with performance and efficiency.

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Co-funded by the European Union



RITMOCORE

Innovation for a healthy heartbeat

 **Agència de Qualitat
i Avaluació Sanitàries de Catalunya**
AGENCY FOR HEALTH QUALITY AND ASSESSMENT OF CATALUNYA

 **Liverpool Heart and Chest Hospital**
NHS Foundation Trust

 **INNOVATION AGENCY**
Academic Health Partners Network
for the North West Coast

 **Smart Homes**

 **AZIENDE SANITARIE E COMUNI
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