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EHRA European Heart Rhythm Association

Public procurement of cardiac implantable electronic devices across Europe: are we purchasing value or cost-effectiveness?

Lucía Osoro [1,2,3], Elena Arbelo [2,4], Nikola Kozhuharov [2,5], Runa Landen [2,6], Martin Martinek [7], Christophe Leclerq [8], Laurent Fauchier [9], Jean-Claude De Haro [10,11], Serge Boveda [12], Philipp Sommer [13], Michiel Rienstra [14], Piotr Symanski [15], Michal Farkowski [16], Anastasia Egorova [17], Francisco Moscoso Costa [18], Diana Tint [19], Stefan Simovic [20], Krasimir Dzhinsov [21], Francisco Leyva [22], Giuseppe Boriani [23], Josep Figueras [24], Zenichi Ihara [25], Jose Luis Merino [26], Haran Burri [27], Helmut Pürerfellner [6], and Rubén Casado-Arroyo [1,2]*

[1]Department of Cardiology, H.U.B.-Hôpital Erasme, Université Libre de Bruxelles, Brussels 1070, Belgium; [2]EHRA Advocacy, Quality Improvement, and Health Economics Committee (European Heart Rhythm Association), Sophia Antipolis, France; [3]Centro Universitario HM Hospitales de Ciencias de la Salud (CUHMED), Universidad Camilo José Cela. Madrid, Spain; [4]Department of Cardiology, Hospital Clinic, Barcelona, Spain; [5]Department of Cardiology, University Hospital Bern—Inselspital, Freiburgstrasse 20, Bern 3010, Switzerland; [6]Institute of Medicine—Sahlgrenska Academy, University of Gothenburg, Gothenburg, Sweden; [7]Department of Cardiology, Ordensklinikum Linz Elisabethinen, Linz, Austria; [8]Department of Cardiology, CHU Rennes—Hôpital Pontchaillou, Rennes, France; [9]Department of Cardiology, Hôpital Trousseau, CHRU de Tours, Tours, France; [10]Assistance Publique – Hôpitaux de Marseille, Centre Hospitalier Universitaire La Timone, Service de Cardiologie, Marseille, France; [11]Faculty of Medicine, Aix Marseille Université, C2VN, Marseille, France; [12]Cardiac Arrhythmia Department, Clinique Pasteur, Toulouse, France; [13]Heart and Diabetes Center North Rhine-Westphalia, University Clinic of Bochum, Bad Oeynhausen, Germany; [14]University of Groningen, University Medical Centre Groningen, Groningen, The Netherlands; [15]Clinical Cardiology Department, National Institute of Medicine MSWiA, Warszawa, Poland; [16]Arrhythmia Unit, Ministry of Interior and Administration National Medical Institute, Warsaw, Poland; [17]Cardiology Department, Leiden University Medical Center, Leiden, The Netherlands; [18]Cardiology Department, Hospital da Luz, SA, Lisbon, Portugal; [19]Faculty of Medicine, Transilvania University of Brasov, Brasov, Romania; [20]Faculty of Medical Sciences, University of Kragujevac, Kragujevac, Serbia; [21]Electrophysiology Unit, University Hospital 'Sveti Georgi', Plovdiv, Bulgaria; [22]Medical Research Department, Aston University, Birmingham, United Kingdom of Great Britain & Northern Ireland; [23]Department of Cardiology, Policlinico di Modena, Italy; [24]European Health Observatory on Health Systems and Policies, Brussels, Belgium; [25]Health Economics and Reimbursement, Abbott, Zaventem, Belgium; [26]Cardiac Robotic Unit, La Paz University Hospital, Madrid, Spain; and [27]Cardiology Department, University Hospital of Geneva, Geneva, Switzerland

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Aims Procurement of cardiac implantable electronic devices (CIEDs) across the European Union is shaped by diverse healthcare systems, reimbursement mechanisms and levels of clinician involvement. Despite a shared legal framework, limited comparative data are available on how procurement is implemented across countries.

Objective The objectives of this study are to examine CIED procurement strategies in 22 European countries where public tendering is mandatory and to explore how clinical, economic and structural factors influence procurement processes.

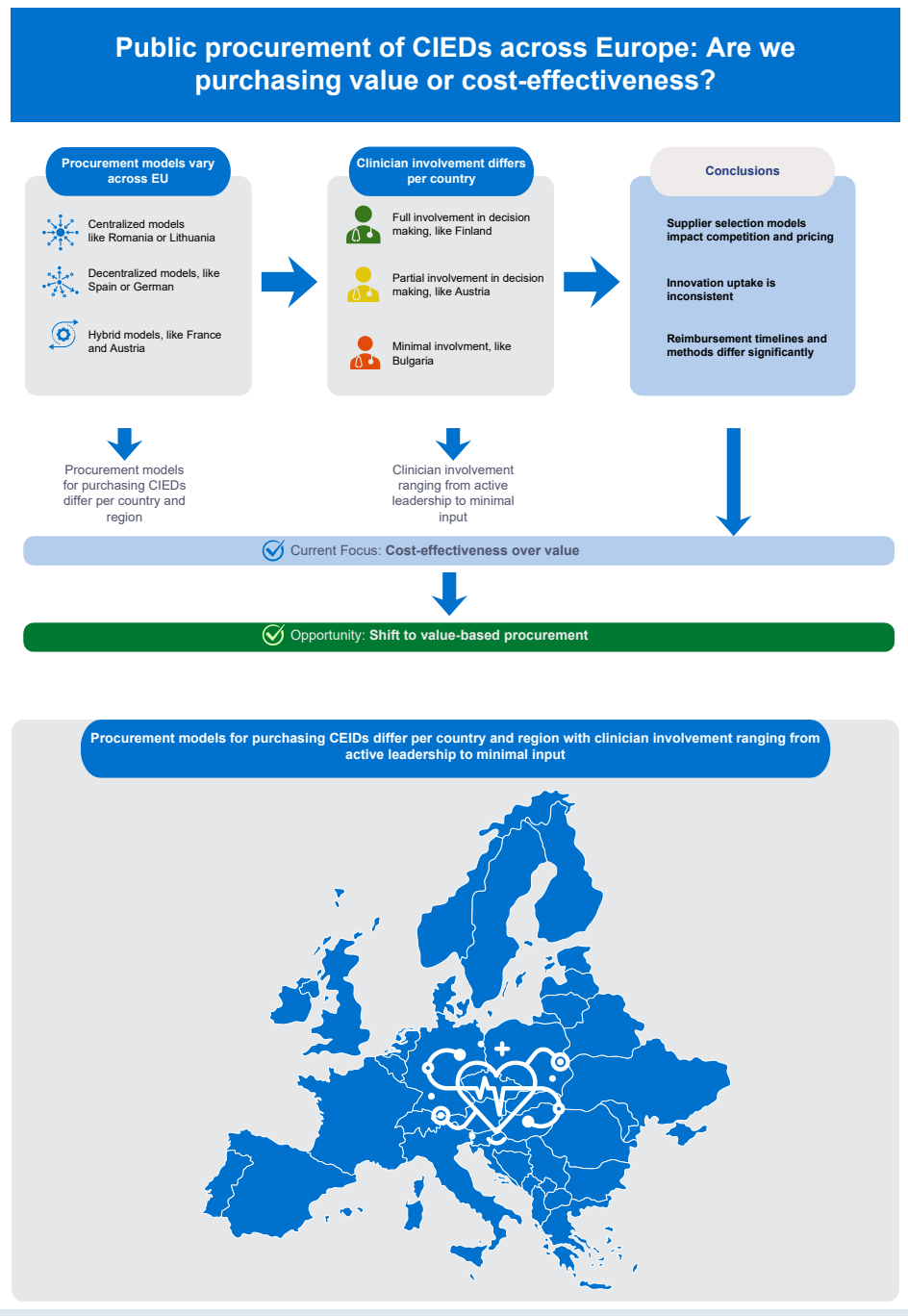
Methods and results We conducted 23 structured interviews with cardiologists and one industry expert across 22 European countries. A thematic analysis was used to synthesize procurement models, clinical involvement and reimbursement structures. No formal outcome or cost-effectiveness analysis was performed. Procurement models varied widely, encompassing centralized,

* Corresponding author. *E-mail address*: ruben.casadoarroyo@hubruxelles.be

decentralized and hybrid systems. Clinician involvement ranged from leading device selection based on clinical criteria to being excluded from decision-making in systems driven primarily by price. Reimbursement pathways also differed, with procedure tariffs for single-chamber pacemakers ranging from €1059 to €14 889. A single region in Finland had implemented a pilot value-based procurement model linking payment to patient outcomes.

Conclusion Cardiac implantable electronic device procurement across Europe is heterogeneous and predominantly cost driven, with limited integration of clinical outcomes or value-based principles. While not designed to evaluate cost-effectiveness directly, this study identifies procurement structures that may support or hinder value-based decision-making. Further research is needed to assess how procurement impacts clinical outcomes, innovation adoption and system sustainability.

Graphical Abstract



Keywords Cardiac implantable devices • Public procurement • Value-based healthcare • Health economics • Reimbursement • Pacemakers • EU health systems

Table of contents

Introduction

The European Union (EU) comprises 27 countries with distinct healthcare financing, governance, and procurement systems. This heterogeneity significantly limits the ability of EU institutions to harmonize health-related practices, particularly in the public procurement of medical technologies. Of the more than €2 trillion spent annually on public procurement across the EU, ~70% is linked to the healthcare sector, encompassing everything from essential medicines to complex medical devices.[1–3]

Although EU procurement is regulated by directives such as 2004/18/EC and 2014/23/EU,[3] implementation varies widely across Member States. National and regional authorities interpret and apply procurement rules differently, shaped by institutional frameworks, reimbursement models, and the level of clinical stakeholder engagement. As a result, public procurement for cardiac implantable electronic devices (CIEDs) differs not only between countries but also across regions and hospitals within them.[4–7]

Prior research has examined procurement innovations such as centralized purchasing and cross-border tenders.[8–11] However, there remains limited empirical insight into how these mechanisms apply to CIEDs: a category of high-cost, high-impact technologies that require careful clinical selection and long-term patient matching.[12]

This study addresses that gap. Drawing on 23 semi-structured interviews with cardiologists and industry experts from 22 European countries, we map the current procurement and reimbursement landscape for CIEDs. We assess levels of clinical involvement, identify structural inefficiencies, and explore opportunities for value-based approaches. In doing so, we offer policy-relevant insights to support more equitable, efficient, and innovation-friendly procurement systems across Europe.[13]

Methods

This study was conducted under the auspices of the European Heart Rhythm Association (EHRA) between March and June 2025, with the aim of mapping procurement and reimbursement practices for CIEDs across Europe. The research design was descriptive and comparative, drawing on structured stakeholder interviews and documentary analysis. While interviews served as the primary data source, this was not a formal qualitative study, and no inferential coding or frequency analysis was performed.

Participant selection and data collection

Participants were purposively selected to ensure national coverage and included 22 cardiologists and one industry representative with regional procurement oversight. Each cardiologist had direct experience with device selection, procurement procedures, or reimbursement planning at the hospital or national level. Recruitment was conducted through EHRA-affiliated contacts, professional societies, and national networks, with a focus on identifying individuals with operational insight into procurement.

Structured interviews were conducted by a senior researcher (R.C.-A.) with the support of a junior analyst (L.O.). A standardized interview guide was used to ensure consistency across countries. Questions addressed procurement structures, clinician roles, reimbursement frameworks, and barriers to innovation. Interviews were conducted virtually in English, French, or Spanish, recorded with participant consent, and transcribed verbatim. Participants reviewed and corrected their transcripts for accuracy.

Reimbursement data sources

Information on device pricing and procedural reimbursement was collected through official national sources such as the French Assurance Maladie database, the German G-DRG catalogue, the Italian Ministry of Health tariff lists, and the UK NHS reference costs. Where multiple tariff schemes existed, the most widely used or nationally representative figures were selected. All figures reflect listed prices or reimbursement rates published as of 14 October 2025. Confidential discounts or negotiated transaction prices were not available.

Ethical considerations

All participants provided informed consent and were assured of confidentiality. No personal identifiers are disclosed in the manuscript. As the study did not involve patients, clinical data, or experimental interventions, it was exempt from formal ethics board review. The research adhered to the European Code of Conduct for Research Integrity and followed good practice standards for expert consultation in health policy research.

Results

Between September 2024 and May 2025, we conducted 23 interviews across 22 European countries with practicing cardiologists involved in CIED implantation or procurement (P1–P23, Supplementary material online, *Appendix Table A1*). The dataset spans a diverse range of public and private institutions including Austria, Belgium, Bulgaria, Denmark, Estonia, Finland, France, Germany, Iceland, Italy, Latvia, Lithuania, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Spain, Sweden, Switzerland and the UK (*Figure 1*). One industry representative participated, but their responses were excluded from this section to preserve clinical focus and neutrality as advised by peer review.

Participants were asked to describe national and local procurement models, their individual roles in the process, criteria used to assess device quality and pricing, and how innovation is incorporated into public tenders. While findings are presented below under three thematic areas, strong interdependence was observed between procurement model type, reimbursement approach, and clinician involvement. Distinct differences emerged between centralized and decentralized procurement systems, with direct implications for supplier engagement, tender design, device selection, and access to new technologies. The timeline between tender publication and contract award varied widely, although a broad trend towards multi-supplier models was observed in an effort to ensure continuity of supply and mitigate product shortages. Most notably, regional differences in how health systems

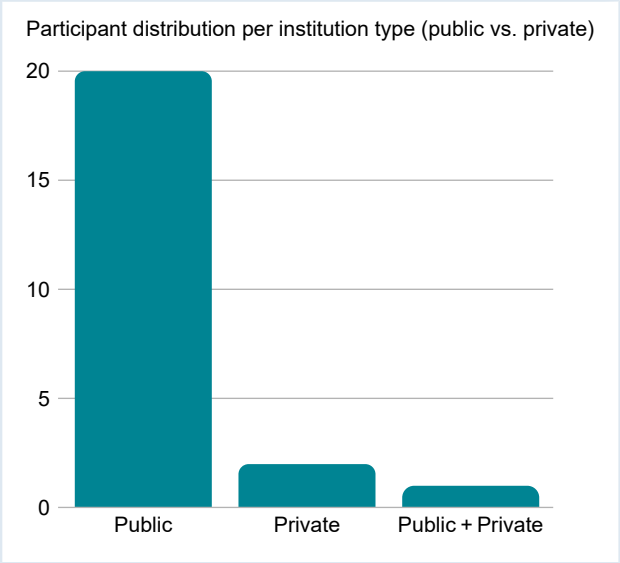


Figure 1 Participants' distribution by institution type.

approach the introduction of new CIEDs highlighted the fragmented nature of procurement innovation across Europe.

Variations in procurement models across Europe

Procurement structures for CIEDs vary considerably across Europe, shaped by differences in national healthcare governance, decentralization, and purchasing authority. Based on interviews conducted in 22 countries, three main procurement models emerged: centralized, decentralized, and hybrid, as outlined in *Table 1* and *Figure 2*.

Centralized procurement models were reported in countries such as Lithuania, Bulgaria, Romania, Latvia, and Estonia, where tenders are typically managed by national authorities, including Ministries of Health or central insurance funds. These systems aim to ensure administrative efficiency and standardized pricing. However, interviewees noted that such arrangements often constrain local hospital autonomy and limit clinician involvement in device selection.[1,14–20]

In contrast, decentralized procurement is characteristic of Germany, Spain, Italy, Switzerland, the Netherlands, Belgium, Portugal, and the UK, where authority rests with regional governments or individual hospitals. These models were praised for enabling alignment with clinical needs and providing flexibility for procurement at the point of care. However, they were also associated with pricing variation and lack of national standardization.[1,21–29]

Hybrid models, as observed in France, Austria, Sweden, Finland, Denmark, and Norway, combine national oversight, such as reference pricing or quality control frameworks with local-level tender execution. In these systems, hospitals typically select from approved supplier lists within national parameters, balancing clinical discretion with cost-efficiency.[1,5,30–35]

Tender structure further differentiates national approaches. In Bulgaria and pre-reform Estonia, single-winner tenders have led to supply concentration, occasionally resulting in monopolies or delays. In Bulgaria, the National Health Insurance Fund directly manages national pacemaker tenders, with hospitals acting as end users rather than buyers. Conversely, countries such as Austria, the UK, and post-reform Estonia utilize multi-supplier tenders, mandating a minimum number of suppliers per category. Interviewees in these systems reported improved resilience, clinical choice, and reduced supplier dependency.

Eastern and South-Eastern European countries, including Bulgaria, Romania, Poland, Lithuania, Latvia, Estonia, and Serbia, were reported to emphasize cost minimization as the primary tender criterion. While this achieved price reduction, clinicians frequently warned that excessive compression undermined device quality, limited innovation uptake, and exposed systems to supplier exits.

A notable example is Estonia's reform of its procurement system in 2024–2025, transitioning from a single-vendor model to a multi-supplier framework. Interviewees highlighted that this change improved product availability and allowed greater alignment between device features and patient needs.

Cross-border and joint procurement efforts remain limited but promising. The Baltic countries, with occasional Nordic collaboration, have piloted joint tenders under the framework of EU Directive 2014/24/EU.[36] While early stage, these initiatives suggest potential for improved purchasing power and shared evaluation processes.

Country-specific nuances also influence procurement processes. In the Netherlands, academic hospitals typically oversee their own tenders, while regional hospitals join consortia or use broader procurement frameworks. Respondents stressed that Dutch procurement practices maintain a strict separation between clinical decision-making and financial negotiations, supported by anti-corruption safeguards.

Finally, Finland presents a rare example of value-based procurement (VBP) in CIEDs. One regional authority implemented a model in which payment is tied to long-term outcomes over a follow-up period, rather than per procedure. Although limited in scope, this approach integrates cost and quality goals and is viewed as a model for future procurement innovation in Europe.[37]

Role of cardiologists in procurement

The role of cardiologists in procurement processes differs substantially across European health systems. In countries such as France, Poland, Romania, and Italy, clinicians are actively engaged in defining the technical and clinical criteria used in public tenders. Cardiologists in these systems often serve on procurement committees, helping to evaluate device specifications and ensure clinical appropriateness. For instance, in leading French university hospitals, interviewees described a weighted scoring system where technical, clinical, and economic factors are jointly assessed, and multiple suppliers are retained to preserve clinician choice and ensure flexibility at the point of care.

In Sweden, Austria, and Finland, cardiologists operate within multi-supplier procurement frameworks, which allow them to select the most appropriate device for each patient from a list of pre-approved vendors. This autonomy was seen by interviewees as crucial for aligning procurement with evidence-based, personalized care. In contrast, systems that rely predominantly on cost-based criteria, such as Bulgaria or the pre-reform model in Estonia, tend to limit clinician involvement to verifying basic device functionality, with little to no influence on supplier selection or pricing structures.

Several Western European countries, including the Netherlands and Belgium, have implemented strict safeguards to regulate interactions between clinicians and the medical device industry. These include mandatory declarations of financial interests, restrictions on participation in pricing discussions, and transparent governance mechanisms. Respondents in these countries highlighted that while these measures protect against conflicts of interest, they also necessitate clear communication between procurement teams and clinicians to maintain clinical relevance in tendering decisions.[38]

Reimbursement differences

Reimbursement models for CIEDs differ substantially across European countries, both in structure and in the levels of financial coverage provided.[39] Two primary models are employed, as detailed in *Table 2*.[40–50] In the device-based model, a fixed tariff is assigned to each device. As of

Table 1 Overview of the procurement process for CIEDs per country

Country	Healthcare system type	CIEDs' procurement approach	Procurement based on quality vs. pricing	Procurement timelines	Innovation policy	Providers
Austria	Federal SHI, regionally administered	Public tenders: devices split across two suppliers per lot	50% quality/specs, 50% pricing	Federal and regional level; varies locally	Active innovation procurement at the national level	Public and private mix with federal insurance
Belgium	Decentralized SHI system	Framework contracts by hospitals; central reimbursement	Quality-driven frameworks; pricing tied to volume thresholds	Depends on the hospital contract cycles	Hospital board reviews new tech requests	Framework contracts; reimbursement led
Bulgaria	Centralized SHI model	CIEDs: national tender for pacemakers; ICDs/CRTs handled locally	Minimum technical features; price driven	Centralized; NHIF cycles with local hospital input	Last in the EU innovation policy ranking	Predominantly public providers under NHIF
Denmark	Decentralized public system across three tiers	Hospital-specific tenders; regional discretion on pricing/quality mix	Mix varies; typically, price heavy in some hospitals	Undisclosed; generally 2–4 years	Allowed if justified; varies by centre	No required supplier number; varies regionally
Estonia	Centralized SHI via EHIF	National tenders: now moving to dual-supplier model	Price and quality split; flexible or fixed volume	Central EHIF tenders with periodic review	EHIF integrates new criteria in purchasing	EHIF contracts; providers mainly private law
Finland	Decentralized (WSCs), publicly funded + NHI	Innovative life-cycle mode in one region; hospital carries risk; risk-sharing agreements with companies	Innovative value-based procurement in one region; pricing over device lifetime	Decentralized (WSCs); negotiated life-cycle contracts	Anticipatory innovation governance model implemented	Municipal primary care, public specialized care
France	Mixed SHI and tax-funded system	Public hospitals: no tender for pacemakers; ICDs based on GDR	No tender for pacemakers; fixed reimbursement; price less decisive	Central with regional input; flexible cycles	National innovation procurement policy active	MoH as steward, broad hospital freedom
Germany	Federal SHI with corporatist self-governance	Hospital-led tenders; corporatist negotiation by groups or consortiums	Volume driven; quality must meet minimums; pricing drives choice	Varies by group; negotiated yearly or multi-year terms	Devices beyond DRG must be justified clinically	Clinicians define minimums; public/private procurement
Italy	Decentralized National Health Service with regional autonomy	National and regional tenders; split volume by provider	50–55% pricing; technical/clinical form 45–50%	National, 2–4 years; regional, decided locally	Region-led HTAs; not publicly funded	3–4 providers per tender; 70–20–10% splits
Latvia	Centralized, publicly funded, limited benefits package	Joint procurement with the Baltics, CIED tenders similar to Lithuania	Collaboratio driven; aims at better pricing through joint tenders	Joint Baltic procurements: national cycles	Joint Baltic strategy; national innovation support	Public + Baltic framework participation
Lithuania	Centralized, single-payer via NHIF	National volume-based tenders; recent tenders heavily skewed to one supplier	Publicly disclosed pricing; bureaucratic, volume driven	Centralized tenders; NHIF managed	National policy supports innovation procurement	Public hospitals under the NHIF contract system
Netherlands	Social Health Insurance with universal coverage	Varies by hospital; academic = public tender, regional = direct negotiation	Hospital-developed formula; pricing important, but quality considered	Decentralized; negotiated per hospital or insurer	MedMij framework for health data innovation	Private insurers and providers dominate

Continued

Table 1 *Continued*

Country	Healthcare system type	CIEDs' procurement approach	Procurement based on quality vs. pricing	Procurement timelines	Innovation policy	Providers
Norway	Semi-decentralized system via RHAs and municipalities	National-level tenders: 3–4 suppliers now	50% quality/service and 50% pricing (point-based system)	Max 4 years with possible annual adjustments	Direct innovation testing allowed; must meet value criteria	3–4 suppliers per tender, moving from a single-source model
Poland	Decentralized SHI system	Hospital-level procurement with cardiologist involvement	No universal standard; varies case by case (e.g. 60/40 or 40/60)	Annual budgets, tender cycles, irregular	Barriers from thresholds and budget caps	Clinician-led evaluation; some private group tenders
Portugal	National Health Service with integrated local units	Public hospitals: central platform with committee; private centres negotiate directly	Evaluation committees, clinical specs prioritized, pricing transparent	3–4-year review cycles for public hospitals	Innovation within budgeted packages; test in high-volume centres	Public, central platform; private: direct supplier deals
Romania	Centralized, mandatory insurance via NHIF	National tenders; hospital-level allocation by volume and cost	Clinicians define minimums; the price cap drives selection	Annual tenders with several review meetings	Public approval and limited reimbursement; private flexibility	Multiple providers: Medtronic, Biotronik, Boston, etc.
Serbia	Centralized, universal with mandatory insurance via NHIF	Nationally managed by NHIF, hospitals choose among approved providers	Based on pricing, the technical specs set by clinicians	Recentralized in 2019, Ministry-led procurement	2021–2025 national innovation strategy in development	Ministry of Health oversight; NHIF implements
Spain	decentralized SNS with autonomous communities	Regional-/hospital-level tenders; packages by technical specs	Must meet specs; lowest price used unless clinically justified otherwise	Regional agreements; durations vary per tender	Must improve outcomes; some direct tenders allowed	Multiple brands per lot; optional volume obligations
Sweden	Decentralized, universal, tax funded	Regional tenders with multiple suppliers; 2–4-year contracts	Point-based system; balanced price and clinical criteria	Decentralized, regional-level cycles	Active national framework for innovation procurement	Public providers under regional authority
Switzerland	Decentralized, insurancebased, federalist	Hospital managed, decentralized pricing negotiation	French cantons = clinical focus; German cantons = cost-efficiency	Decentralized; managed at cantonal and hospital levels	Four sectoral innovation policies (e.g. environment and energy)	Private providers, cantonal funding variations
UK	Decentralized NHS models across four nations	NHS trust-level procurement; integration of clinical input	Clinical specs with pricing balance; varies by region/trust	Trust-level schedules vary by region	Evaluated per trust; requires clinical justification	Open to multiple providers; volume sharing common

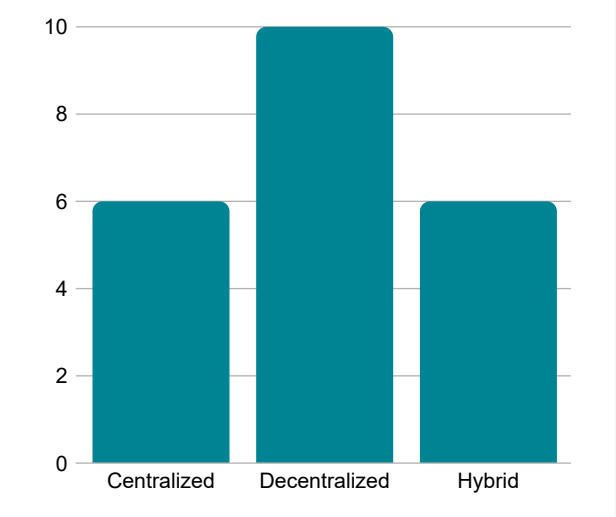


Figure 2 Classification of public procurement models for CIEDs across 23 European countries. Centralized systems manage tenders at national level; decentralized systems devolve authority to regional or hospital levels; hybrid models combine national frameworks with local discretion.

October 2025, reimbursement rates for single-chamber pacemakers ranged from €1059 to €5448. In contrast, procedure-based models, most commonly using diagnosis-related group (DRG) codes, bundle all associated costs, including the device, surgical intervention, hospital stay, and perioperative care, into a single payment. Diagnosis-related group tariffs for single-chamber pacemaker procedures were found to vary widely, from €1798 to €14 889.

Further complexity arises in certain systems, such as Belgium and parts of France's private sector, where physicians receive additional professional fees for each implantation. This layer of remuneration contributes to a fragmented landscape that complicates cross-country comparisons and may exacerbate inequities in access to advanced CIED technologies.

Securing reimbursement for new or high-cost devices, such as leadless pacemakers, remains a significant challenge. In countries including Italy, Lithuania, and Spain, central- or hospital-level approval is typically required before new technologies are included in tenders or reimbursed. This can result in delays in patient access. Conversely, France and Switzerland permit early-stage procurement of innovative devices at the hospital level, even in the absence of national reimbursement. While this facilitates early clinical use, it also creates financial strain and uncertainty if national approval is delayed.

Interviewees widely acknowledged that these variations in reimbursement mechanisms impact both access to innovation and long-term system sustainability. Fragmentation in funding strategies was cited as a barrier to equitable adoption of advanced technologies. Moreover, the disconnect between procurement decisions and reimbursement alignment often leads to inefficiencies and delays in patient care. As such, harmonizing payment pathways and incorporating clearer support for innovation were highlighted as priorities for policy reform.

Discussion

This study highlights the significant heterogeneity in the procurement and reimbursement of CIEDs across Europe. Despite shared regulatory underpinnings through EU directives, national implementation diverges sharply due to structural, legal, and institutional differences. These disparities influence not only procurement strategies but also clinician involvement, price transparency, and equitable access to innovation.

Fragmentation in procurement models

Cardiac implantable electronic device procurement frameworks are closely aligned with national health system structures. Centralized procurement, as seen in Bulgaria, Lithuania, and Romania, offers administrative efficiency and cost containment through national-level tenders but tends to limit clinical autonomy. By contrast, decentralized models, common in Germany, Italy, and the UK, allow procurement at the hospital or regional level, fostering responsiveness to clinical needs but potentially generating inconsistent pricing and supplier diversity.

Hybrid models, such as those in France, Sweden, and Austria, attempt to combine national oversight with local decision-making. However, the degree of clinical influence and standardization remains inconsistent. Early cross-border collaborations, such as those led by the Baltic states and Nordic countries under Directive 2014/24/EU,[36] illustrate the feasibility of shared procurement for high-cost devices, though these initiatives remain nascent.

Clinical involvement in procurement: scope and constraints

The involvement of cardiologists in procurement varies substantially. In countries such as France, Poland, and Italy, cardiologists contribute to the drafting of technical specifications and serve on evaluation committees. These roles enable alignment of tenders with clinical needs and long-term outcomes. Conversely, in countries where procurement is primarily cost driven, such as Bulgaria or historically Estonia, clinicians have little input, often limited to verifying basic functionality.

Multi-supplier tenders, such as those now adopted in Austria and Estonia, offer clinicians more flexibility in matching devices to patient profiles. However, in systems with strict anti-corruption and transparency laws, such as Belgium and the Netherlands, physician involvement in financial negotiations is constrained. Interviewees emphasized that increased clinician engagement, balanced with appropriate governance and training, could improve alignment between procurement and care quality.

Reimbursement variability and implications for access

Substantial differences in reimbursement structures were observed, affecting both device-level and procedure-level funding. As outlined in *Table 2*,[40–50] the tariffs for a single-chamber pacemaker vary more than three-fold across countries, with some nations reimbursing devices directly and others bundling costs through DRG-based systems. This inconsistency hinders cross-country comparison, creates disincentives for innovation, and may lead to inequitable access to new technologies.

In certain countries, such as Italy, Spain, and Lithuania, delays in reimbursement approval for advanced devices such as leadless pacemakers were noted. In contrast, hospitals in France and Switzerland may pilot new devices without initial national reimbursement, supporting early evaluation but raising sustainability concerns. The Spanish model, which integrates all CIED costs into public tenders, was cited as a potential example of equitable access.

Value-based models: emerging but limited

The introduction of a VBP pilot in one Finnish region offers an example of aligning payment with outcomes rather than volume. Under this model, reimbursement is tied to post-implantation clinical metrics over a defined follow-up period.[37] However, VBP remains rare in Europe, and its implementation faces challenges, including limited access to outcome data, lack of standard performance indicators, and system fragmentation.[51,52]

Table 2 Reimbursement of CIEDs overview per device category and country. Currency exchange rate used: • 1 EUR = 0.87 GBP; 0.99 CHF; 4.46 PLN

SINGLE-CHAMBER PACEMAKER					
Country	**Physician fee**	**Procedure**	**Device[a]**	**Total (or DRG)**	**Reimbursement source**
Austria[40]		–		€5.574,00	Austria MoH
Belgium[41]	€27 583		€4.126,00	€4.401,83	INAMI
France (private)[42]	€27 919	€1513.97	€1.795,40	€3.588,56	Assurance Maladie
France (public)[43]		€2.727,61	€1.795,40	€4.523,01	Assurance Maladie
Germany[44]		€4.331,05	€1.059,95	€5.391,71	G-DRG
Italy[45]		–		€4.756,00	Italian MoH
Netherlands[46]		€3.268,00		€12.110,00	Zorginstituut Nederland
Poland[47]		–		€1.798,88	NFZ Poland
Spain[48]	–	–	–	–	Servicio Nacional de Salud
Switzerland[49]		€9.309,13	€5.580,72	€14.889,85	Swiss DRG
UK[50]		–		€2.858,66	NHS England
DUAL-CHAMBER PACEMAKER					
Country	**Physician fee**	**Procedure**	**Device**	**Total (or DRG)**	**Reimbursement source**
Austria[40]		–		€5.992,00	Austria MoH
Belgium[41]	€27 583		€4.674,00	€4.949,83	INAMI
France (private)[42]	€27 919	€1513.97	€3.138,67	€4.931,83	Assurance Maladie
France (public)[43]		€2.727,61	€3.138,67	€5.866,28	Assurance Maladie
Germany[44]		€4.331,05	€1.059,95	€5.391,71	G-DRG
Italy[45]		–		€4.756,00	Italian MoH
Netherlands[46]		€3.268,00		€12.110,00	Zorginstituut Nederland
Poland[47]		–		€2.199,10	NFZ Poland
Spain[48]	–	–	–	–	Servicio Nacional de Salud
Switzerland[49]		€9.251,56	€6.630,95	€15.882,51	Swiss DRG
UK[50]		–		€3.545,62	NHS England
CARDIAC RESYNCHRONIZATION THERAPY—PACEMAKER					
Country	**Physician fee**	**Procedure**	**Device**	**Total (or DRG)**	**Reimbursement source**
Austria[1]		–		€9.587,00	Austria MoH
Belgium[41]	€27 583		€7.329,34	€7.605,17	INAMI
France (private)[42]	€28 623	€1513.97	€5.317,15	€8.044,76	Assurance Maladie
France (public)[43]		€2.727,61	€5.317,15	€7.117,35	Assurance Maladie
Germany[44]		€5.241,89	€3.687,17	€8.929,06	G-DRG
Italy[45]		–		€9.384,00	Italian MoH
Netherlands[46]		€3.268,00		€16.445,00	Zorginstituut Nederland
Poland[47]		–		€4.063,52	NFZ Poland
Spain[48]	–	–	–	–	Servicio Nacional de Salud

Continued

Table 2 *Continued*

Country	Physician fee	Procedure	Device	Total (or DRG)	Reimbursement source
CARDIAC RESYNCHRONIZATION THERAPY—PACEMAKER					
Switzerland[49]		€9.702,81	€12.106,15	€21.808,96	Swiss DRG
UK[50]		–		€9.440,74	NHS England
SINGLE CHAMBER ICD					
Austria[40]		–		€13.148,00	Austria MoH
Belgium[41]	€27 583		€14.520,53	€14.796,36	INAMI
France (private)[42]	€30 823	–	€1.285,09	€16.442,38	Assurance Maladie
France (public)[43]		–	€1.285,09	€18.114,88	Assurance Maladie
Germany[44]		€4.888,29	€3.957,27	€8.845,56	G-DRG
Italy[45]		–		€16.573,00	Italian MoH
Netherlands[46]		€3.268,00		€23.765,00	Zorginstituut Nederland
Poland[47]		–		€4.914,93	NFZ Poland
Spain[48]	–	–	–	–	Servicio Nacional de Salud
Switzerland[49]		€9.064,40	€17.118,15	€26.182,55	Swiss DRG
UK[50]		€5.262,43		€5.262,43	NHS England
DUAL-CHAMBER ICD					
Austria[40]		–		€13.148,00	Austria MoH
Belgium[41]	€27 583		€15.630,80	€15.906,63	INAMI
France (private)[42]	€31 452	–	€2.570,18	€16.442,38	Assurance Maladie
France (public)[43]		–	€2.570,18	€18.114,88	Assurance Maladie
Germany[44]		€5.796,76	€4.582,39	€10.379,15	G-DRG
Italy[45]		–		€16.573,00	Italian MoH
Netherlands[46]		€3.268,00		€23.765,00	Zorginstituut Nederland
Poland[47]		–		€4.914,93	NFZ Poland
Spain[48]	–	–	–	–	Servicio Nacional de Salud
Switzerland[49]		€10.662,20	€22.940,70	€33.602,90	Swiss DRG
UK[50]		€5.262,43		€5.262,43	NHS England
CARDIAC RESYNCHRONIZATION THERAPY–DEFIBRILLATOR					
Austria[40]		–		€16.002,00	Austria MoH
Belgium[41]	€27 583		€16.368,40	€16.644,23	INAMI
France (private)[42]	€32 201	–	€3.855,27	€16.442,38	Assurance Maladie
France (public)[43]		–	€3.855,27	€18.114,88	Assurance Maladie
Germany[44]		€5.801,75	€7.169,99	€12.971,74	G-DRG
Italy[45]		–		€16.573,00	Italian MoH
Netherlands[46]		€3.268,00		€24.602,00	Zorginstituut Nederland
Poland[47]		–		€7.821,32	NFZ Poland
Spain[48]	–	–	–	–	Servicio Nacional de Salud

Continued

Table 2 *Continued*

CARDIAC RESYNCHRONIZATION THERAPY–DEFIBRILLATOR					
Country	**Physician fee**	**Procedure**	**Device**	**Total (or DRG)**	**Reimbursement source**
Switzerland[49]		€9.504,44	€26.702,95	€36.207,39	Swiss DRG
UK[50]		€7.892,49		€7.892,49	NHS England
INSERTABLE CARDIAC MONITOR					
Country	**Physician fee**	**Procedure**	**Device**	**Total (or DRG)**	**Reimbursement source**
Austria[40]		–		€7.162,00	Austria MoH
Belgium[41]			€2.122,65	€2.122,65	INAMI
France (private)[42]	€5 716	€43 258	€1.408,77	€1.898,18	Assurance Maladie
France (public)[43]		€75 658	€1.408,77	€2.165,35	Assurance Maladie
Germany[44]		€4.331,05	€1.059,95	€5.391,71	G-DRG
Italy[45]		–		€3.547,00	Italian MoH
Netherlands[46]		€1.634,00		€4.095,00	Zorginstituut Nederland
Poland[47]		–		€83 277	NFZ Poland
Spain[48]	–	–	–	–	Servicio Nacional de Salud
Switzerland[49]		€9.309,13	€5.580,72	€14.889,85	Swiss DRG
UK[50]		—		€2.940,63	NHS England
LEADLESS PACEMAKER					
Country	**Physician fee**	**Procedure**	**Device**	**Total (or DRG)**	**Reimbursement source**
Austria[40]		–		€5.574,00	Austria MoH
Belgium[41]	€27 583		€4.126,00	€4.401,83	INAMI
France (private)[42]	€77 200	€1513.97	€6.300,00	€8.585,97	Assurance Maladie
France (public)[43]		€2.727,61	€6.300,00	€9.027,61	Assurance Maladie
Germany[44]		€5.801,75	€7.169,99	€12.971,74	G-DRG
Italy[45]		–		€4.756,00	Italian MoH
Netherlands[46]		€3.268,00		€12.110,00	Zorginstituut Nederland
Poland[47]		–		€4.090,91	NFZ Poland
Spain[48]	–	–	–	–	Servicio Nacional de Salud
Switzerland[49]		€9.702,81	€12.106,15	€21.808,96	Swiss DRG
UK[50]		€2.858,66		€2.858,66	NHS England

[a]The German and Swiss device prices represent the retrospective national average implant costs associated with the relevant DRG, as reported in the DRG cost matrices. These costs may also include other devices that fall within the same DRG category. However, France and Belgium have a brand-specific device reimbursement catalogue. In UK (England), some devices may be paid separately outside of the tariff.

Critically, the current study did not attempt to measure 'value' or 'cost-effectiveness' in economic terms. These concepts require outcomes data and comparative effectiveness analyses, which were outside the scope of this qualitative study. While some interviewees referenced VBP frameworks, their comments were observational and not systematically evaluated.

Towards a more coherent European strategy

While procurement policy remains a national competence, EU-level coordination could promote alignment in key areas such as transparency, data infrastructure, and innovation uptake, as outlined in *Figure 3*. Joint purchasing mechanisms, such as those developed during the SARS-CoV-2 virus pandemic, demonstrate the feasibility and value of shared strategies. A more cohesive approach could reduce fragmentation, empower smaller markets, and incentivize quality-based competition among suppliers.[51,53]

To that end, professional societies such as EHRA could lead efforts to define minimum clinical criteria for device selection and establish procurement evaluation standards. Supporting clinicians with training in procurement processes, health economics, and ethical governance may also improve their contribution while safeguarding against conflicts of interest.

Limitations

This study has several limitations that should be acknowledged. Although participants were purposively selected to ensure national

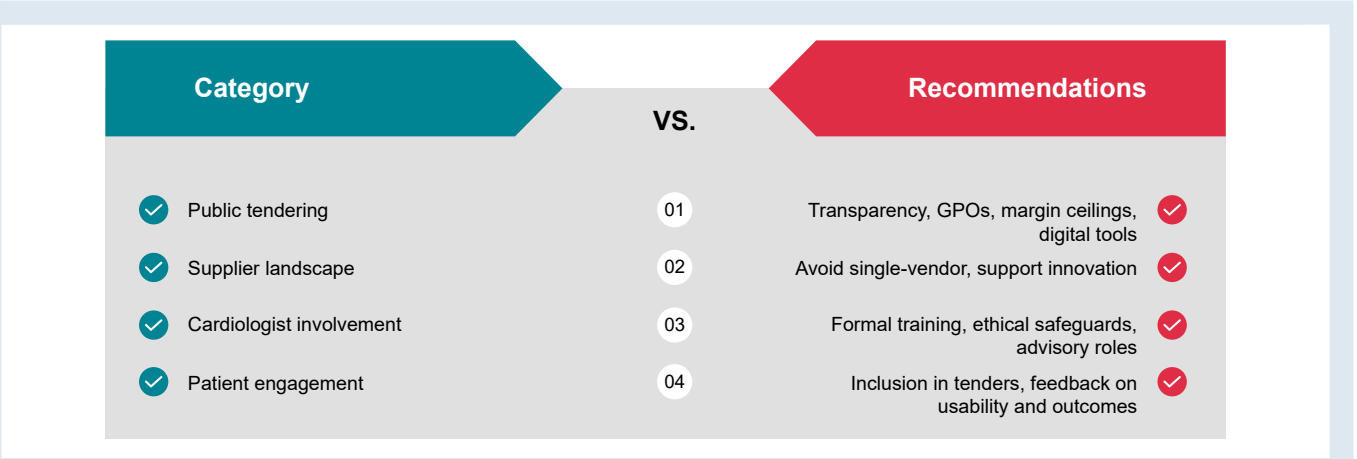


Figure 3 Key policy recommendations to enhance CIED procurement systems in Europe. Thematic priorities identified include improving transparency in public tendering, promoting balanced supplier competition, enhancing cardiologist involvement with appropriate safeguards, and integrating patient perspectives into procurement design.

coverage and to capture both clinical and procurement perspectives, the inclusion of a single representative per country may not fully reflect regional or institutional variations. Health systems such as those of Spain, Italy, and the UK encompass multiple procurement structures and reimbursement mechanisms, and these intra-country differences may therefore be underrepresented.

While all participants reviewed their interview transcripts and provided corrections to ensure accuracy, qualitative interviews are inherently interpretative and may include subjective perceptions influenced by local experience. Some inconsistencies in interpretation or emphasis across countries are therefore possible. Moreover, given the limited number of respondents and the lack of Delphi methodology or structured quantitative analysis, the thematic findings should be interpreted as exploratory insights rather than definitive patterns.

Reimbursement data were collected from official national databases and publicly available sources; however, these figures represent listed tariffs or reimbursement benchmarks, not the confidential net prices negotiated between hospitals and suppliers. As such, they should be interpreted as indicative rather than actual transaction values. Professional fee structures were available only for selected countries and may not capture broader variation in physician reimbursement across systems.

Additionally, potential conflicts of interest among participants, particularly in relation to clinical or commercial roles, were not formally audited or declared beyond verbal confirmation of independence. This limitation may affect the objectivity of some perspectives.

Finally, procurement and reimbursement frameworks are dynamic and may have evolved since data collection. Despite these limitations, this study provides a unique comparative overview of CIED procurement practices across Europe, identifying key structural and policy differences that can inform future reforms.

Conclusion

This study provides a comparative overview of CIED procurement practices across 22 European countries, identifying wide variation in purchasing structures, clinician involvement, and reimbursement mechanisms. While centralized models offer cost control, decentralized and hybrid approaches better support clinical autonomy and device personalization. Reimbursement frameworks, including both device-specific tariffs and bundled payments, exhibit substantial variability in value and transparency, complicating cross-country comparisons. Only a few regions, such as in Finland, have begun to explore structured value-based procurement models. The findings underscore the lack of harmonized procurement governance across the EU and highlight the potential benefits of increasing clinical input, improving transparency, and encouraging outcome-linked reimbursement to promote access, quality, and innovation in device therapy.

Supplementary material

Supplementary material is available at *Europace* online.

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Data availability

The datasets generated and analysed during the current study are not publicly available due to confidentiality agreements and the qualitative nature of the data, which include personal professional opinions expressed during interviews. To protect participant anonymity, full transcripts and audio recordings cannot be shared. Summarized or aggregated data supporting the findings of this study are available from the corresponding author upon reasonable request.

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