MANAGEMENT OF DEVICE-DETECTED SUBCLINICAL ATRIAL FIBRILLATION: A EUROPEAN HEART RHYTHM ASSOCIATION SURVEY.

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ABSTRACT

Background and aims. Device-detected subclinical atrial fibrillation (DDAF) is increasingly documented either with implantable cardiac electronic devices (CIED) or with consumer-based mobile or wearable monitors. The management of this condition is still matter of debate.

Methods. This is a physician-based survey with 24 multiple-choice questions.

Results. A total of 222 physicians from 46 countries responded the survey. DDAF is frequent, occurring in >10% of CIEDs follow-up for 37% of respondents. Oral anticoagulation is prescribed according to CHA_2DS_2-VA and AF duration; 34% of the respondents initiate anticoagulation with AF > 24 hours, 26% with AF > 6 hours and 15% with AF > 5-6 minutes. Respondents from Non-European countries and Mediterranean Europe are more likely to prescribe diagnostic exams and therapy than respondents from North Europe. Systematic long-term AF screening with implantable loop recorder (ILR) after cryptogenic stroke ranges from 43±27% of ILR implanted for that purpose in Mediterranean countries to 10±20% in North Europe. The majority of responders recommends the use of consumer-based devices to screen for AF mainly in specific situations (undiagnosed palpitations, ischemic stroke or AF burden monitoring) and not routinely, just according to CHA_2DS_2-VA or age.

Conclusion. AF screening is not routinely performed, either in primary or secondary prevention of stroke. Device-detected AF is not uncommon and generally managed based on thromboembolic risk and duration of episodes; the cut-offs of AF duration, global burden and number of episodes are yet to be determined in terms of role and clinical value. Clinicians' approaches to subclinical AF remain heterogeneous.

Key words: atrial fibrillation – oral anticoagulation – implantable devices – consumed-based devices – screening

Introduction

Atrial fibrillation (AF) is the most common sustained arrhythmia worldwide, with incident cases doubling every few decades and a further increase anticipated in the future [1], resulting in high

morbidity and mortality and increased health care costs. A timely diagnosis of AF is crucial to avoid severe complications but often challenging due to the high proportion of asymptomatic episodes.

Thanks to recent technological advancement, a great improvement in AF detection has been achieved through the widespread adoption of innovative devices, also equipped with artificial intelligence algorithms [2].

According to latest ESC guidelines, "clinical AF" refers only to AF episodes, either symptomatic or asymptomatic, which are clearly documented with ECG recording. Besides that, an increasing number of asymptomatic episodes are currently detected by continuous-monitoring devices ("device detected AF", DDAF), including both implantable cardiac electronic devices (CIED) and consumer-based mobile or wearable monitors, such as smartwatches and fitness trackers. Most of these devices are patient-based and easily available without medical prescription even in low-risk populations; they are usually used for other purposes (e.g. monitor of heart rate during everyday life or sports). In this context, incidental detection of AF is not uncommon.

The availability of these new tools changed therefore the AF detection scenario, moving from a primarily symptoms- and ECG-driven AF diagnosis to an opportunistic screening, leading to a higher proportion of silent AF [3].

The management of DD AF is still a matter of debate. However, recently evidence has emerged on specific aspects and the delicate risk/benefit balance of anticoagulation initiation [1, 4-5].

The aim of this European Heart Rhythm Association (EHRA) survey was to describe the current clinical practice in the detection of DDAF, considering both physician-driven opportunistic AF

screening for high-risk patients and patient-based monitoring in low risk subjects. The survey aimed also to describe different standards of care throughout the EHRA community and to detect the main areas of heterogeneity among respondents and discrepancies with guidelines recommendations.

Methods

This is a physician-based survey conducted between January 7th and February 14th 2025 and distributed through all EHRA channels, including social media platforms and e-mails to EHRA members. Participation in the survey was voluntary and anonymous.

The online questionnaire consisted of 24 multiple-choice questions developed by the EHRA Scientific Initiative Committee and included 6 sections: (1) baseline characteristics of the responder, (2) subclinical AF detected by intracardiac signals with pacemakers (PM) or implantable cardioverter defibrillators (ICD), (3) subclinical AF detected by implantable devices without intracardiac signals (implantable loop recorders, ILR), (4) subclinical AF detected by mobile or wearable devices providing single or multiple ECG tracings, (5) arrhythmia detection not reliant on ECG-based devices and (6) diagnosis and therapy (**Supplementary Material, Appendix 1**).

The respondents were classified according to their country of activity into Central, East, Mediterranean, North Europe or Non-European Countries, as shown in **Figure 1**.

Categorical variables were presented numerically with absolute percentages (%) and analysed using descriptive statistical methods with chi-square test. Continuous variables were presented

with mean and either standard deviation or range and analysed using the t-test for comparison of means. P values < 0.05 were considered statistically significant.

Results

Demographics

The questionnaire was answered by a total of 222 physicians, 162 recruited with the e-campaign and 60 through social-media. The participants were from 24 European and 22 non-European countries belonging to the EHRA community. 82% of the responders work in European countries and 18% in non-European countries; among Europe, the survey was mostly taken by physician working in Mediterranean countries (**Figure 1**; **Supplementary Material, Appendix 2, Table a**).

Regarding the professional experience, 9% of the responders has been practising as a healthcare professional for 0-5 years, 21% for 6-10 years, 37% for 11-20 years, 20% for 21-30 years and 13% for more than 30 years.

Most of the responders worked at University Hospitals (116, 62%); 59 (32%) at non-University Hospitals, 21 (11%) in specialised Cardiology Centres and 17 (9%) in Private Centres (of note, multiple answers were allowed). About half of the physicians (100, 54%) worked at high volume centres, with more than 200 PM implants/year and 22 of them (12%) declared more than 200 ILR implants/year. The rate of physicians working in centres with no implantation at all of PM, ICD or ILR was not negligible, respectively 17 (9%), 6 (3%) and 14 (8%).

Most of the participants were personally involved in PM/ICD/ILR implantation and follow up (154, 83%), in the EP department (153, 82%), in remote monitoring of devices (131, 70%) or in AF ablation (128, 61%) while only a minority of the responders (8, 4%) was involved in the clinical activities of a stroke unit.

Among the five geographical regions, significant differences were observed in respondent's experience ($p = 0.027$), working institution type ($p = 0.002$), availability of device remote monitoring and AF ablation in hospital ($0 = 0.006$ and $p = 0.007$ respectively), personal experience in device remote monitoring and AF ablation (both $p < 0.001$) and PM/ICD/ILR implants volume of the working institution ($p < 0.001$) (**Supplementary Material Appendix 2, Table b**).

Subclinical AF detected by intracardiac signals (pacemaker/implantable cardioverter-defibrillator)

The first scenario we explored concerned subclinical AF detected by CIEDs (PM/ICD with an atrial lead) using intracardiac signals. According to this survey, this finding is quite frequent, happening in <5% of devices follow up for 22% of the responders, in 5-10% of devices follow up for 41%, in 10-20% of devices follow up for 28% and in >20% of devices follow up for 9% of the responders respectively.

Interestingly, the management of device detected subclinical AF was very heterogeneous (**Figure 2**); most of the responders never or rarely prescribe Holter ECG (108, 66%) to establish a diagnosis of clinical AF, but many respondents start remote monitoring of the device (78, 47%) or increase the frequency of ambulatory device interrogation (69, 41%). Blood tests and echocardiography are prescribed at least sometimes by 124 (77%) and 134 (81%) of the responders respectively.

Most of the participants considered a rhythm control strategy (121, 73%) and, in patients with ICD, activated algorithms to avoid inappropriate shocks (161, 97%).

A different management of device detected subclinical AF appeared not related to respondents' experience but we observed statistically significant differences depending on the country area of work, in particular for Holter ECG prescription ($p = 0.023$), increasing the frequency of ambulatory follow up ($p = 0.001$), blood tests/echo prescription (both $p < 0.001$) and aiming for rhythm control ($p = 0.004$). Non-European and Mediterranean countries initiated more diagnostic studies with higher rate of examinations and therapy prescription while North European countries showed more conservative attitude (**Figure 3**).

The decision of starting anticoagulation in patients with subclinical AF detected at PM/ICD follow up was taken accordingly to CHA_2DS_2-VA score and the duration of AF episodes, as described in **Table 1**. Given a CHA_2DS_2-VA score ≥ 2, the physicians from Mediterranean and East Europe mostly prescribed anticoagulation when AF duration was more than 1-6 hours, while physicians from Central and North Europe when AF duration was more than 24 hours and physicians from non-European Countries when AF duration was more than 5-6 minutes (**Supplementary Material, Appendix 2, Table c**).

Subclinical AF detected by implantable devices without intracardiac signals (implantable loop recorder)

Heterogeneity was observed for the use of ILR to screen for asymptomatic AF after cryptogenic ischemic stroke, with a mean of 31% of respondents implanting ILR for that purpose, but a wide

variation, from 0 to 95%, across centres. Mediterranean Europe (43 ± 27%) and North Europe (10 ± 20%) were the areas where most and less ILRs were implanted for that indication respectively.

The majority of ILR implants in that context were performed when the location and characteristics of the ischemic area at cerebral MRI imaging were highly suggestive of an embolic source (78, 52%), following an extensive but inconclusive diagnostic work-up (including TEE) for cardioembolic origin (76, 51%) or in patients with multiple cerebral ischemic areas (50, 34%).

Most of the participants screened for AF with continuous telemetry ECG monitoring during hospital stay and intermittent Holter ECG respectively lasting 24 hours (44, 30%), 72 hours (44, 30%) or 7 days (26, 18%) after cryptogenic ischemic stroke before implanting ILR. Opportunistic screening for AF using ILR in that specific very high-risk population leads to AF detection in 22% of cases (range 0-90%), most commonly after a delay of 1-6 months (83, 60%).

Most of the patients with ILR implanted for AF screening purposes were followed up exclusively with remote monitoring (59%, range 0-100%), especially in Mediterranean Europe (75%).

Subclinical AF detected by mobile or wearable devices providing single or multiple ECG tracings

The most common consumer-based device used by the patients of the survey's respondents to monitor cardiac rhythm was a smartwatch (85%). It was reported by respondents that many patients also rely on intermittent ECG rhythm strips obtained through smartphones or dedicated apps exploiting the photoplethysmography technology (42%) or on 1-2 weeks continuous ECG-patches (26%).

All the responses concerning the indications to the use of mobile or wearable devices providing a single or multiple lead ECG tracings to screen for subclinical AF are summarised in **Figure 4**. Most of the responders recommended the use of these devices in patients complaining of palpitations (125, 83%) and in patients with previous ischemic stroke (94, 64%). Only one third of the responders considered age > 65 years or CHA_2DS_2-VA > 2 good reasons to suggest rhythm monitoring using such devices (47, 32% and 50, 34% respectively).

Concerns raised by the use of consumer-based devices capable of ECG monitoring resulted from the potential anxiety caused by abnormal results (107, 71%), followed by the overdiagnosis and overtreatment due to misinterpretation of ECG tracings (91, 60%) and the increase in the number of unnecessary visits (88, 58%). Only 13% of the responders were not concerned about the widespread use of such devices.

Arrhythmia detection not reliant on ECG-based devices

The interpretation of data derived by non-ECG-based devices divides the responders. When facing "AF episodes" detected by such devices, 60 physicians (42%) looked for arrhythmia confirmation with ECG Holter recording, 44 (31%) requested a 12-lead ECG irrespective of the presence of symptoms and 36 (25%) assessed the patient's symptoms first, and requested a 12-lead ECG only if symptoms were present. Interestingly, only 2% of the responders do not perform other examinations.

Diagnosis and therapy

The last section of the questionnaire investigated more deeply the diagnostic and therapeutic measures taken after silent AF confirmation. Nearly all the responders considered CHA_2DS_2-VA score (133, 96%) or AF duration (129, 93%) influential or very influential for anticoagulation prescription. The type of device used for diagnosis and the number of episodes of AF were generally considered less influential when deciding to initiate anticoagulation (**Figure 5**). Significant differences were found among the responders from different geographical areas, with the type of device used for diagnosis ($p = 0.037$), AF burden ($p = 0.002$) and number of AF episodes ($p = 0.023$), mostly taken into consideration, respectively, by Non-European countries, Central Europe and Mediterranean Europe and less considered by North Europe (**Supplementary material, Appendix 2, Figure a and Table d**).

According to the latest ESC guidelines, the implementation of a rhythm control strategy was driven mainly by AF related symptoms and patient's preference which were influential or very influential for 127 (93%) and 119 (87%) responders respectively (**Figure 6**). Significant differences were found only concerning the type of device used for diagnosis ($p = 0.018$) that was mostly taken into consideration when starting rhythm control strategy by East European and Non-European countries (**Supplementary material, Appendix 2, Table e**).

The main indication for AF ablation in patients with device-detected AF was the occurrence of symptoms (42, 30%) followed by arrhythmia progression to "clinical AF" (32, 23%) and the presence of both symptoms and non-responsiveness to antiarrhythmic drugs (24, 17%).

The last question regarded the detection of other arrhythmias (true or false positive) leading to further invasive tests and treatments. Surprisingly, this eventuality was perceived more frequent for PM/ICDs and ILRs than for wearable/mobile devices and non-ECG-based recordings (**Figure 7**).

Discussion

The main findings of this survey are the following: (1) AF detection is not uncommon in CIEDs follow up; (2) generally, there is a low propensity to screen patients for AF; (3) the management of device-detected AF remains heterogeneous among the EHRA community, particularly regarding the prescription of diagnostic tests and the initiation of therapy; (4) CHA_2DS_2-VA score and AF duration remain the most commonly used parameters to decide whether to start anticoagulation or not, but the cut-offs of AF duration, global burden and number of the episodes are yet to be determined in terms of role and clinical value; (5) according to guidelines, pharmacological or interventional strategies for rhythm control are generally driven mainly by AF-related symptoms and patient's preference.

Atrial fibrillation detection at CIEDs follow up

The present survey showed that the reported rate of AF detected at CIEDs follow up is not negligible, with 37% of the respondents finding AF in more than 10% of devices follow up (28% of respondents in 10-20% of devices follow up and 9% even in more than 20% devices follow up). Atrial high-rate episodes - "AHREs"- are a highly prevalent finding in device with atrial sensing capabilities [6]. These events have had variable definitions in the literature and false positives are

fairly common. A meta-analysis of 54 studies with over 72000 patients reported a pooled prevalence of device-detected subclinical AF of 28.1% with high heterogeneity between studies; mean age and follow-up time were significantly, independently and non-linearly associated with AF prevalence [7]. This data underlines a poor correlation between the real epidemiology and the perceived rate of AF detected at CIEDs follow-up reported by the respondents. The real incidence of device-detected AF may be underrated and the problem may be consequently underestimated.

Atrial fibrillation screening

The advent and adoption of devices to screen AF have led to an increase of detection rates, enabling earlier diagnosis and treatment to prevent complications [8 – 9].

Current ESC guidelines suggest population-based screening for AF in patients ≥ 75 years or ≥ 65 years with additional CHA_2DS_2-VA risk factors (class IIa) [1]. This survey shows that regular screening is not broadly performed, confirming the findings of a previous EHRA survey [10].

Early detection of AF enables early treatment that could prevent AF mortality and morbidity especially in high-risk patients, who have an indication for oral anticoagulants (OAC) [9]. After an embolic stroke of unknown source (ESUS), the risk of stroke recurrence is 4-5% per year and AF is reported to be the underlying mechanism in 30% of stroke patients [1]. After stroke, AF can be found in over 20% of cases after 3 years of continuous ECG monitoring [1]. Factors associated with an increased detection of AF after stroke are increasing age, left atrial enlargement, cortical location of stroke, large or small vessel disease, an increased number of atrial premature beats per 24 h, rhythm irregularity and thromboembolic risk stratification scores [1]. The ESC guidelines

recommend prolonged ECG monitoring in patients with ESUS (class IB), especially if the above-mentioned risk factors are present [1]. According to our survey, only a mean of 30% of all the ILR implants are for AF screening after ESUS, with wide variation among countries and a proportion of ILR implants for ESUS that is four times higher in Mediterranean Europe than in Northern Europe. Such a broad variability, even without having real life data about the proportion of ESUS patients implanted with a loop recorder, indirectly suggests lack of consensus for loop recorder implantation in this setting and reflects differences in healthcare systems, device costs and reimbursements.

Broad screening for AF in low-risk patients could also be of primary importance, because it allows the early implementation of the "C section" of "AF CARE" pathway [1] with management and treatment of associated risk factors potentially able to reduce future AF burden and secondary events. In recent years, consumer-based devices capable of AF screening and sometimes purchased for a completely different purpose (fitness or use of smart technology) have become increasingly popular. Our survey confirms that those devices are widely used all over EHRA countries, mostly smartwatches and apps connected to specific devices that can provide intermittent ECG rhythm strips. Despite being consumer-based devices, their use is often recommended by healthcare professionals in specific settings such as in patients complaining of palpitations, with previous ischemic stroke, aged ≥ 65 years or with CHA_2DS_2-VA > 2.

The role of non-ECG based devices to screen for AF has been recently explored in unselected patients discharged home following cardiac surgery in a randomised way; plethysmography-based monitoring was essential to uncover the ongoing risk of atrial arrhythmias after the hospitalization phase, leading to an increased detection of AF or atrial flutter resulting in more AF

management interventions [11]. In the wEHRAbles 2 survey [12] most respondents (74%) would advocate systematic screening for AF using wearable rhythm devices, starting at patients' median age of 60 years, despite the lack of reimbursement [13]. Of note, that survey was conducted in the COVID-19 era (autumn 2020) and the pandemic may have catalysed the use of all types of devices that could reduce the need for on-site visits.

The evidence for clinical effectiveness of digital devices is currently limited [14-15], but their growing use – along with the clinical, economic, legal and policy implications – warrants further investigation of their role. In the near future, artificial intelligence (AI) algorithms may further improve automated AF diagnosis, widespread screening and management of device-detected AF [16-17].

Anticoagulation therapy

The management with OAC therapy of patients with device-detected subclinical AF is still debatable and directly related to the prevalence of AF, the risk of stroke and the balance with the hemorrhagic risk [18-19]. A retrospective analysis on a subgroup of patients from the MOST study showed a 2.5 fold increased risk of death or stroke in subjects with at least one "AHRE" [20]. The ASSERT study demonstrated that subclinical atrial tachyarrhythmias were detected in one tenth of the patients in the first 3 months after PM implantation and at least once during a mean follow-up of 2.5 years in more than one third of the patients; atrial arrhythmias were associated with an increased risk of ischemic stroke or systemic embolism, and that risk was higher in patients with higher CHADs score and with subclinical AF episodes of longer duration; the study was

underpowered to determine the duration cut-off of significant increase risk of stroke, but did not consider episodes lasting less than 6 minutes [21]. A late analysis of ASSERT data demonstrated that patients with AF > 24 hours had a significantly higher risk of systemic stroke or embolism, comparable to the risk of clinical AF; the risk in patients with AF of shorter duration was not significantly different from patients without AF [22]. As well as the cut-off of AF duration and increased risk of stroke has not yet been defined, also the cut-off of AF burden that constitutes a relevant risk of stroke has to be determined. A lower AF burden is associated with a lower risk of stroke and AF burden-reducing interventions can reduce cardiovascular outcomes in patients with AF, especially if associated to heart failure [23]. A recent analysis of ARTESiA showed that a baseline episode duration of subclinical AF > 1 hour, combined with clinical factors and atrial dilatation, predicted a higher risk of progression from subclinical AF to clinical AF, thus giving more hints for personalized decision-making on anticoagulation [24].

In recent years, two randomized trials were published. The NOAH-AFNET 6 compared edoxaban to placebo in patients aged 65 years or more with at least one additional risk factor for stroke and with device-detected AF of at least 6 minutes; the study was terminated early, at a median follow up of 21 months; anticoagulation with edoxaban did not significantly reduce the incidence of a composite of cardiovascular death, stroke or systemic embolism as compared with placebo, but it led to a higher incidence of a composite of death or major bleeding [5]. The incidence of stroke was low in both group (0.9% per patient/year in the edoxaban group vs 1.1% per patient/year in the placebo group, HR 0.79) and was not significantly reduced by the treatment with OAC [5]. In the ARTESiA trial, patients with device-detected AF lasting 6 minutes to 24 hours were randomized to receive either apixaban on Aspirin; after a mean follow up of 3.5 years, the

treatment with OAC resulted in a lower risk of stroke or systemic embolism than Aspirin but a higher risk of major bleeding [4]. Of note, both ARTESiA and NOAH-AFNET6 demonstrated that the risk of stroke or systemic embolism associated with subclinical AF was lower than that observed with clinical AF. The populations of both trials were at high thromboembolic risk (mean CHA_2DS_2-VASc score of 3.9 ± 1.1 and median CHA_2DS_2-VASc score of 4, IQR 3-5, respectively). A subgroup analysis of ARTESiA demonstrated that in patients with CHA_2DS_2-VASc > 4, the benefit of apixaban in preventing embolism exceeds the risk of major bleeding and the opposite is true for patients with CHA_2DS_2-VASc < 4; in the intermediate group with CHA_2DS_2-VASc = 4, patient's preference might drive the decision whether or not to start OAC [25]. A meta-analysis of ARTESiA and NOAH-AFNET6 confirmed the efficacy of OAC in lowering thromboembolic risk, tough elevating the overall bleeding risk without affecting the fatal bleeding risk [26]. Clinical decision-making in patients with subclinical AF must be tailored and shared, accurately balancing risks and benefits on the individual patient [27].

AF has often been approached as a binary disease, but the importance of AF burden is now being increasingly recognised [28-29]. Furthermore, the availability of new resources for AF screening and diagnosis made us aware of the existence of various AF patterns, with a continuum of different stroke risk and potential disease progression. A recent debate of great experts has underlined pro and contra of treating device-detected subclinical AF as clinical AF and a consensus has not yet been reached [6]. All experts agree, however, that subclinical AF should alert cardiologists to the need for addressing potential associated factors [1, 6].

Our survey showed that the decision of starting anticoagulation in patients with device detected subclinical AF was taken according to the latest recommendations using CHA_2DS_2-VA score, and

a score of 2 is considered cut-off for most responders. Only one quarter of the physicians (23%) use the cut-off of CHA_2DS_2-VA > 4 as an absolute marker of high risk irrespective of AF duration and burden, as emerged by the ARTESiA sub-analysis [25].

The cut-off of a single episode of AF duration or total daily or yearly burden associated with an increase of the thromboembolic risk has still to be determined. The finding of our survey that 34% of responders still use a >24-hour threshold, while 15% consider episodes as short as 6 minutes, directly reflects the clinical uncertainty generated by the divergent outcomes of the NOAH-AFNET 6 and ARTESiA trials.

Surprisingly, the type of device used for diagnosis was very influential only for one quarter of the physicians, despite the clear indication of ESC Guidelines concerning the non-reliability of non-ECG traces for AF diagnosis. A previous EHRA survey [11] showed that wearable devices providing single or multiple ECG tracings were considered reliable for AF detection in all clinical scenarios; the respondents of the present survey were more reluctant to use photoplethysmography technologies for diagnosing AF and triggering therapy.

Rhythm control strategy

Rhythm control is an essential part of the "AF-CARE" pathway. The landmark trials performed more than 20 years ago suggested that the main effect of rhythm control strategies was the reduction of AF symptoms, but more recent data showed a reduction in morbidity and mortality associated with sinus rhythm maintenance in selected groups of patients, particularly in patients

with heart failure [1]. Of note, a meta-analysis of randomised controlled trials hints at a potential reduction in the risk of stroke [30].

Our survey demonstrates that rhythm control management in device-detected AF, which is often asymptomatic, is more uniform throughout EHRA members. According to the guidelines, the main driving factors to start any rhythm control strategy are symptoms and patient's preference. Specifically concerning AF ablation, the responders were quite restrictive indicating the procedure only when symptoms occur, when the arrhythmia progresses to "clinical AF" or in presence of both symptoms and non-responsiveness to antiarrhythmic drugs. Subclinical device-detected AF may present the challenge of identifying that minority of patients who might benefit from early rhythm control strategies despite the absence of symptoms, in the perspective to prevent disease progression.

Limitations

The present survey has limitations related to its target responders and the structure of the questionnaire. The survey was distributed through EHRA channels, thus reaching mostly electrophysiologists who are used to analyse different forms of heart rhythm tracings, and therefore the results may not be generalizable to all physicians. Participation was completely voluntary, with possible selection bias. The relatively limited number of respondents, albeit consistent with previously published EHRA Surveys, may be mitigated by the wide distribution among the different EHRA countries. Complete data are not available for all responders, since not all questions were mandatory. In

many questions, more than one answer was allowed and this may have contributed to the dispersion of some results. In addition, despite being carefully evaluated and weighed, inaccuracies may have occurred in the on-line questionnaire leading in some cases to overlapping or non-linear distribution of categorical answers.

Conclusions

Despite the availability and increasing use of physician- and consumer-based non-invasive devices, screening for AF is not routinely performed either in primary or secondary prevention of ischemic stroke. The advantage of using such devices is early AF detection and treatment, triggering the "AF-CARE" pathway when needed, in accordance with recent ESC guidelines. On the other hand, old and new devices provide large amounts of information that the clinician must interpret correctly in order to minimize the risk of over-diagnosis, over-treatment and patient anxiety.

The pros and cons of initiating OAC in subclinical AF are to be carefully weighed and tailored to each individual patient, taking into consideration that thromboembolic risk in subclinical AF is lower than in clinical AF but higher than in patients without AF. Device detected subclinical AF is generally managed based on the CHA_2DS_2-VA score and the duration of the episodes. The impact and cut-off values for of AF duration and burden, particularly in medium-risk patients, remain the main areas of uncertainty and consequent treatment variability throughout the EHRA community, and warrant further investigations.

The current survey is a snapshot of "real-world practice" across Europe and beyond. As patients buy and use more wearable devices, physicians are increasingly being presented with data obtained from such devices and their reactions might have important clinical and legal implications. The wide variability of answers obtained, is a clear evidence of the lack of consensus and highlights the need for more specific guidelines for subclinical AF, especially in light of recent trials. It is of paramount importance to harmonize the management of device-detected AF keeping up with technology and ensuring that technological advancements translate into consistent and optimal patient care.

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Data availability: the data underlying this article will be shared on reasonable request to the corresponding author.

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Tables and figures

Table 1. Indication for anticoagulation prescription in patients with device detected subclinical AF at PM/ICD follow up.

	N, %
CHA_2DS_2-VA $\geq$ 2 and AF episodes > 5-6 minutes	34, 15.3%
CHA_2DS_2-VA $\geq$ 2 and AF episodes > 1-6 hours	59, 26.6%
CHA_2DS_2-VA $\geq$ 2 and AF episodes > 24 hours	77, 34.3%
CHA_2DS_2-VA $\geq$ 2 irrespective of the duration of the AF episodes	12, 5.4%
CHA_2DS_2-VA > 4 irrespective of the duration of the AF episodes	39, 17.6%
Never	1, 0.4%

Figure 1. Respondent's country of activity.

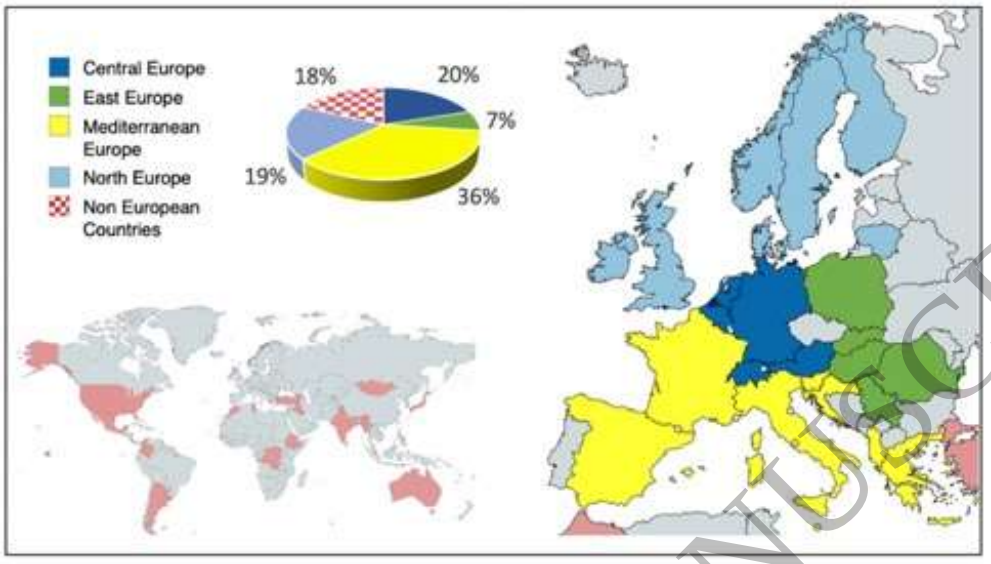


Figure 2. Management of patients with first time PM/ICD detected AF

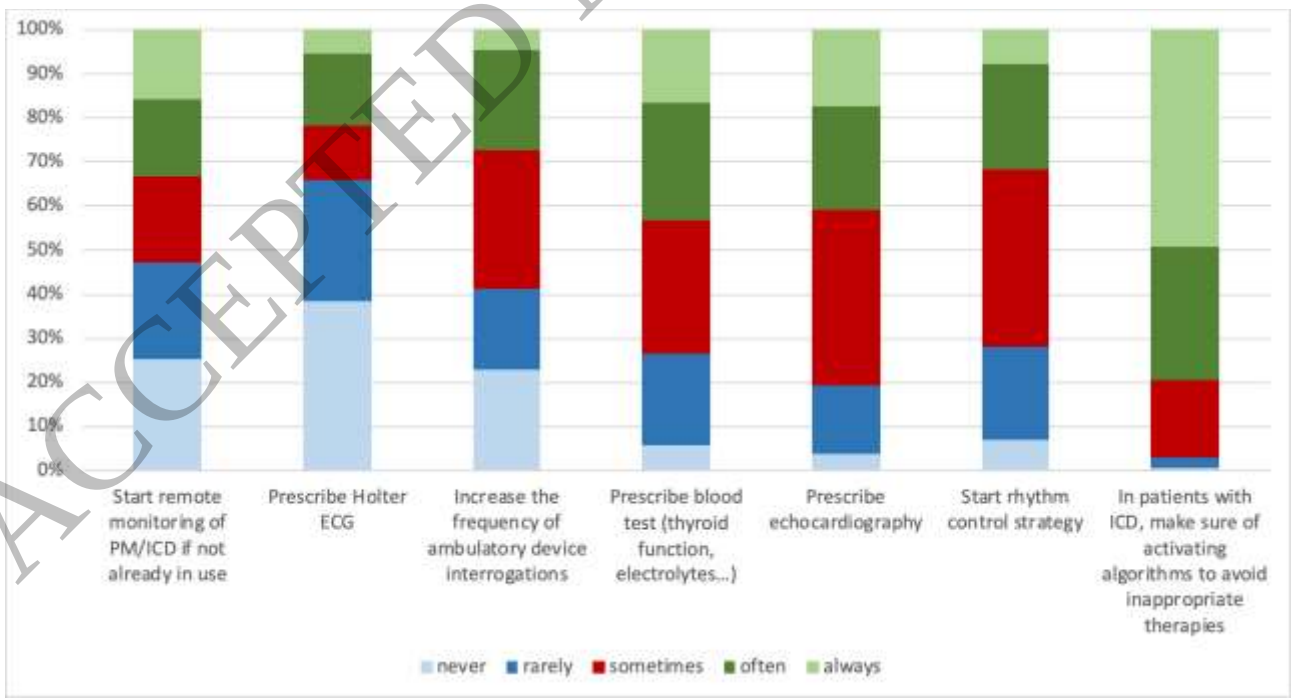


Figure 3. Different approaches to patients with first time PM/ICD detected AF according to different countries of work.

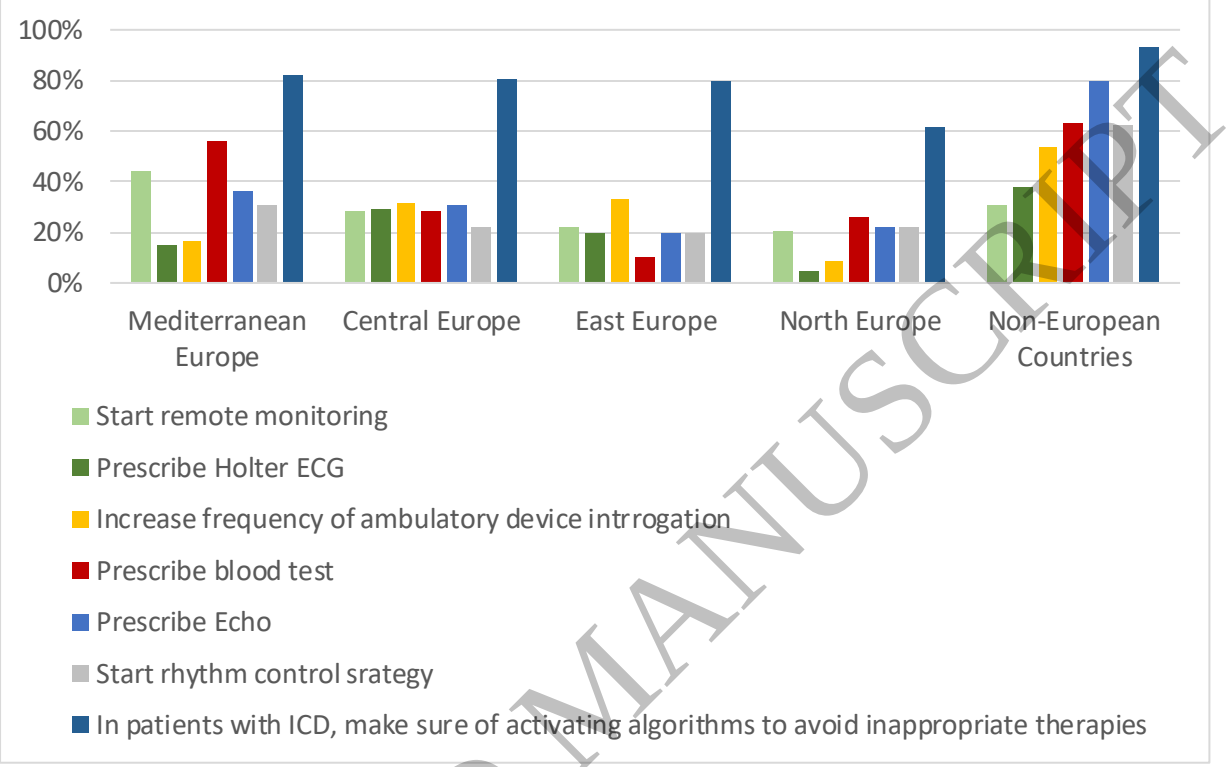


Figure 4. Indications of using mobile or wearable devices capable of recording single- or multiple-lead ECG tracings to screen for subclinical AF.

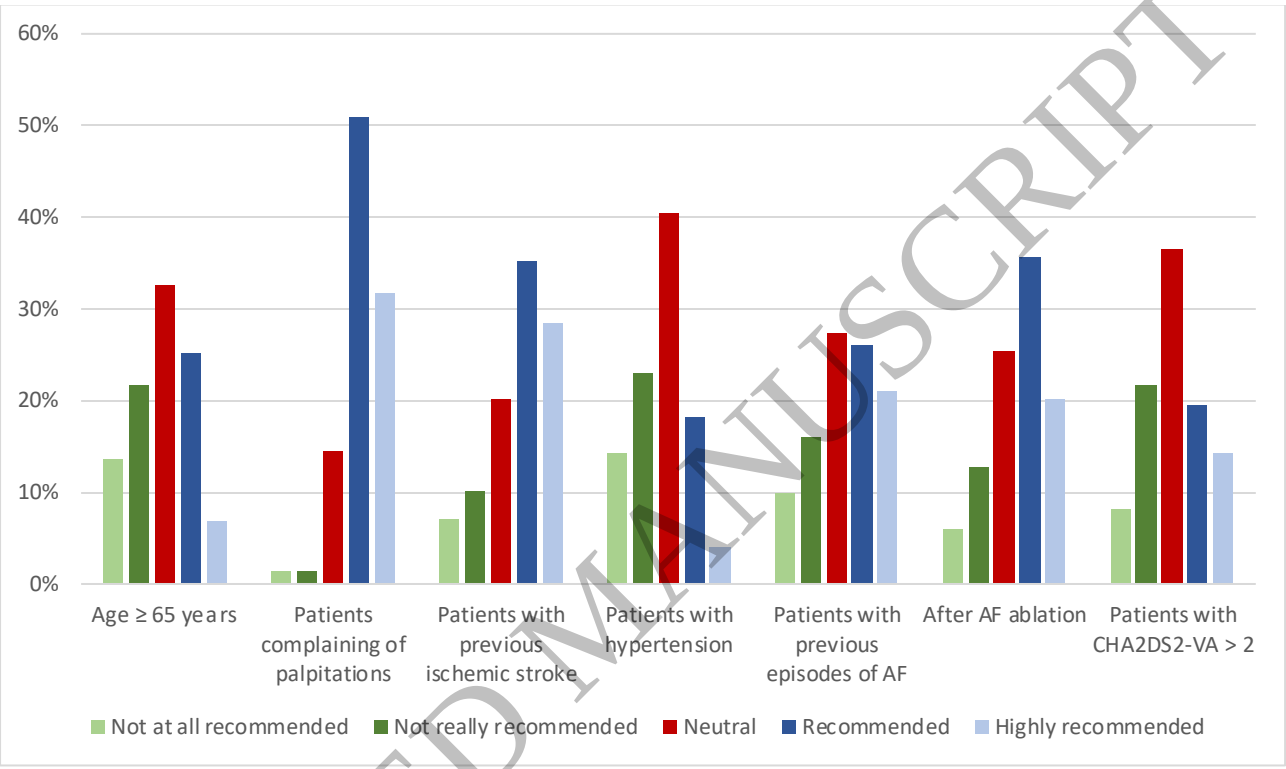


Figure 5. Factors that influence anticoagulant prescription in patients with device-detected subclinical AF.

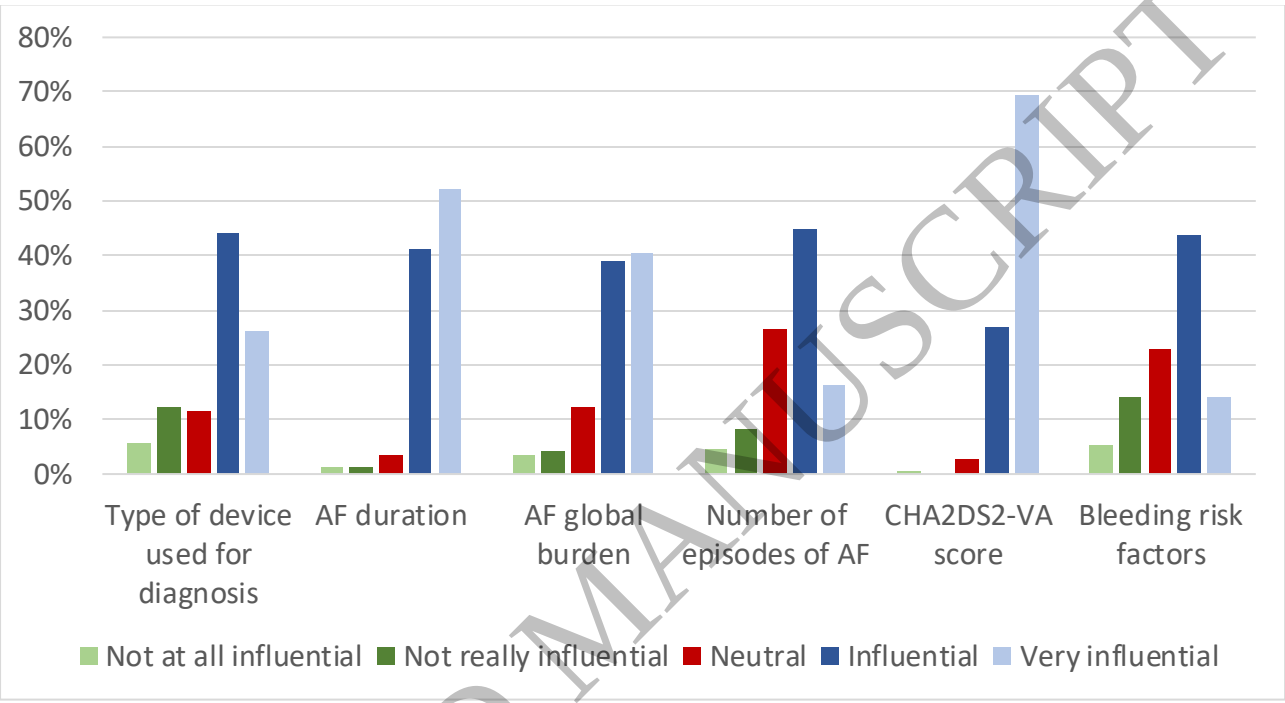


Figure 6. Factors that influence the implementation of rhythm control strategy in patients with device-detected subclinical AF.

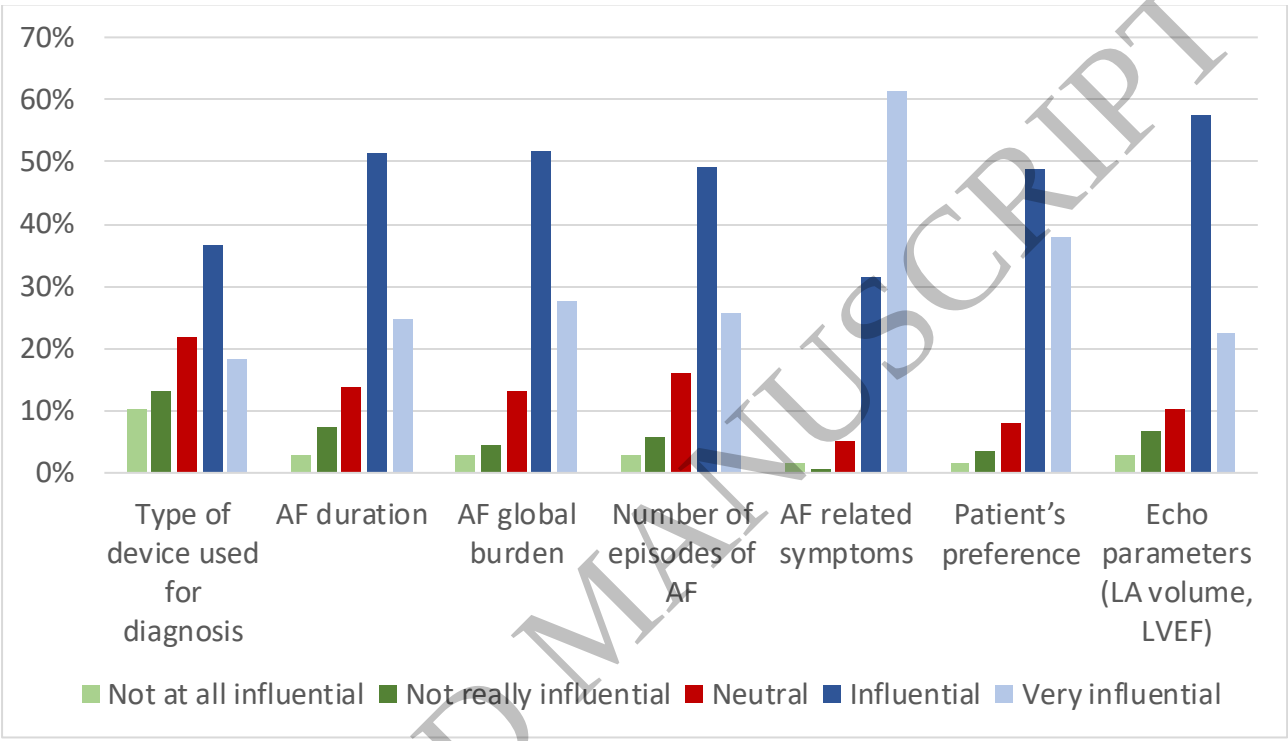
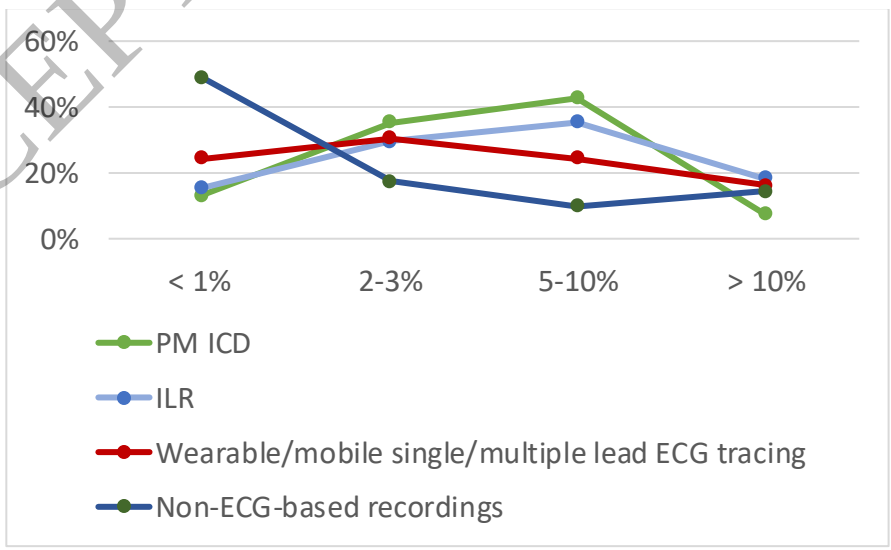
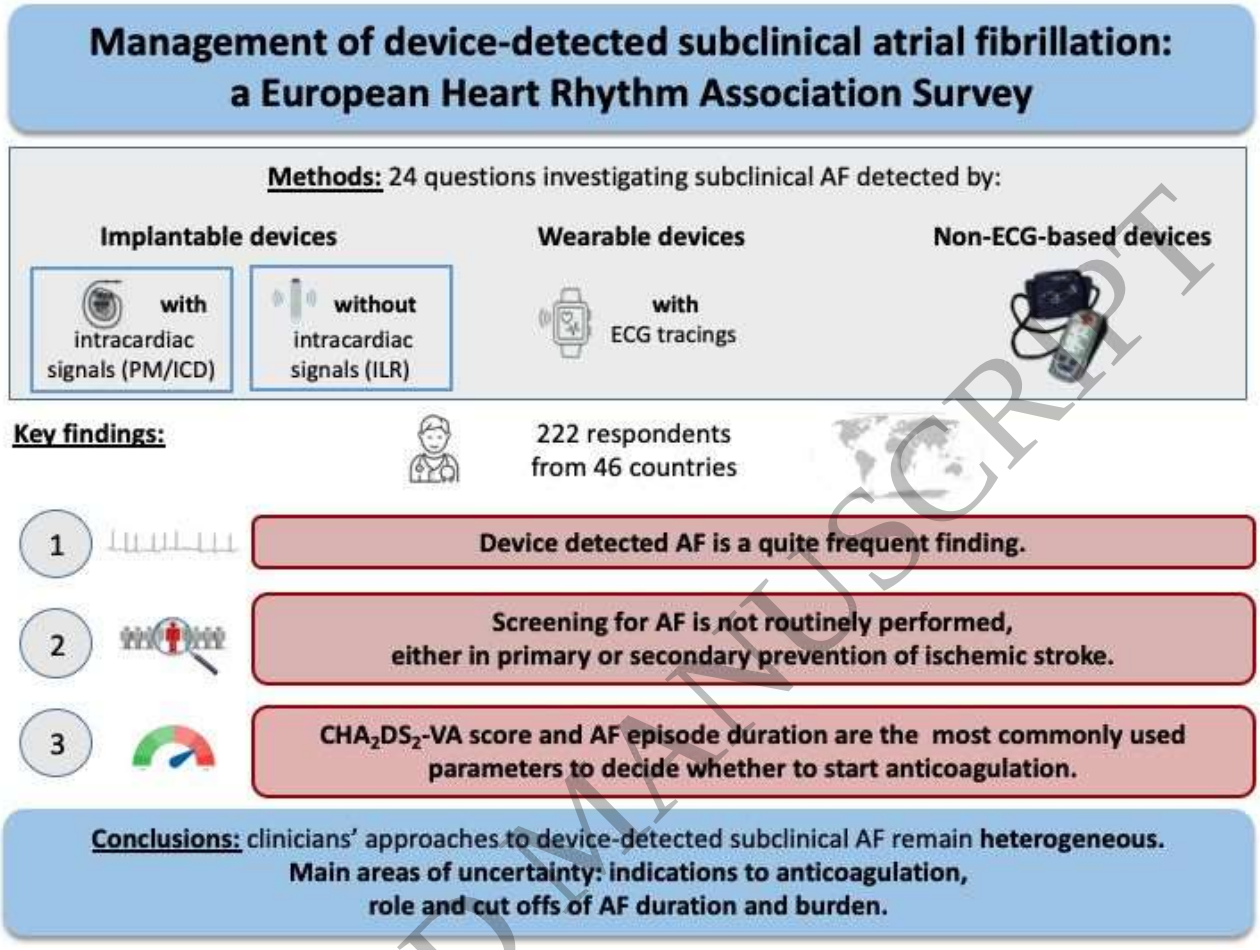


Figure 7. Distribution of the frequency with which implantable or wearable devices may detect other arrhythmias (true or false positive) leading to further invasive testing and treatment.





Graphical Abstract
254x190 mm (x DPI)