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# BMJ Open Actioning atrial fibrillation identified by ambulance services in England: a qualitative exploration

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## ABSTRACT

**Objectives** To explore the acceptability and feasibility of detection of atrial fibrillation (AF) by emergency medical services (EMS) and identify potential barriers and facilitators to implementing a formal pathway to facilitate follow-up in primary care, which could reduce the risk of AF-related stroke.

**Design** Qualitative study using focus groups and one-to-one interviews guided by a semistructured topic guide.

**Setting** North East England.

**Participants** Focus groups with 18 members of the public and one-to-one online interviews with 11 healthcare and service providers (six paramedics and five experts representing cardiology, general practice (GP), public health, research, policy and commissioning).

**Results** All participant groups were supportive of a role of EMS in identifying AF as part of routine assessment and formalising the response to AF detection. However, this should not create delays for EMS since rate-controlled AF is non-urgent and alternative community mechanisms exist to manage it. Public participants were concerned about communication of the AF diagnosis and whether this should be 'on scene' or in a subsequent GP appointment. Paramedics reported frequent incidental identification of AF, but it is not always clear 'on scene' that this is a new diagnosis, and there is variation in practice regarding whether (and how) this is communicated to the GP. Paramedics also focused on ensuring the safety of non-conveyed patients and a perceived need for an 'active' reporting process, so that a finding of AF was actioned. Field experts felt that a formal pathway would be useful and favoured a simple intervention without adding to time pressures unnecessarily.

**Conclusions** There is support for the development of a formal pathway to ensure follow-up for people with AF that is incidentally detected by EMS. This has the potential to improve anticoagulation rates and reduce the risk of stroke.

## INTRODUCTION

Atrial fibrillation (AF) is a common arrhythmia affecting around 11% of people aged 65 years and older in England, and the incidence is increasing.<sup>1 2</sup> It is associated with an elevated risk of stroke and systemic embolism, which can be reduced by two-thirds by taking oral anticoagulation

## STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ We included a diverse group of members of the public, paramedics and field experts to consider the role of emergency medical services in the identification of atrial fibrillation and how it may be followed up.
- ⇒ Focus groups of members of the public allowed discussion and identification of areas of consensus and disagreement.
- ⇒ One-to-one interviews with paramedics and field experts allowed a detailed discussion of the issues with professionals with relevant clinical experience.
- ⇒ However, most respondents were within the North East of England, and other organisational settings and localities are likely to operate under different conditions and have had other experiences.

(OAC).<sup>3</sup> However, around 500 000 people in the UK are thought to have undiagnosed AF.<sup>4</sup> It is estimated that 7000 strokes would be prevented in England annually if OAC was prescribed to all those with undiagnosed AF.<sup>4</sup> Yet as AF is often asymptomatic, it may only be detected incidentally and so may go unrecognised for long periods, and so there is increasing interest in novel opportunities for identifying AF outside scheduled encounters with healthcare providers. These include embedded heart rhythm monitoring technology in supermarket trolleys,<sup>5</sup> pulse checks in podiatry clinics and during home visits by firefighters,<sup>6 7</sup> although population-level screening for AF is not currently supported by the UK National Screening Committee.<sup>8</sup>

In contrast, where AF is discovered as part of an assessment for a different reason, this is an incidental finding. Clinical guidelines suggest that when AF is identified, an evaluation should be made of the person's risk of stroke, and anticoagulation considered.<sup>9</sup> In a UK community setting, this should be provided in primary care with referral to secondary care if specialist input is required for symptom control.<sup>10</sup> However, access to this evaluation is contingent on AF being

diagnosed using an electrocardiogram (ECG). An ECG is often performed by emergency medical services (EMS).<sup>11</sup> As EMS attend to a population representing all demographic groups, they have unique access to some patients who may not regularly engage with primary prevention and screening provision. Although interaction with EMS may represent an important opportunity to incidentally identify AF and arrange appropriate follow-up, there is variation in practice across the UK. There is no national recommendation or National Health Service policy that an ECG should be performed for this purpose, and when we recently surveyed ambulance services nationwide we found that none had a formal pathway for newly identified AF.<sup>12</sup> Where guidance existed, it was to either transport the patient to the hospital or to communicate directly with the primary care provider, which may place an additional burden on stretched resources. Evidence is also lacking on how a notification pathway should be structured, as well as the acceptability of a pathway among paramedics, other healthcare professionals and the public.

We conducted a qualitative study to explore the acceptability and feasibility of AF being identified and disclosed during unscheduled ambulance contacts by EMS from the perspective of a range of key stakeholders and identify potential barriers and facilitators to facilitating follow-up in primary care.

## METHODS

### Study design

Focus groups (FGs) of the public and one-to-one semi-structured interviews with healthcare professionals were used to capture and develop a detailed understanding of participants' views on the identification of AF by paramedics during unscheduled ambulance contacts for patients treated at the scene and not transported onwards to the hospital. Discussion was facilitated by a study topic guide (online supplemental data). FGs of members of the public enabled consultation with a large and diverse group of people and stimulated interactive reflection and rich discussion on a largely unfamiliar topic.<sup>13</sup> One-to-one interviews facilitated healthcare professionals' participation around work commitments and allowed deeper exploration of specific insights, given that they already possessed contextual understanding and were likely to have given the issue prior consideration. The study is reported according to the consolidated criteria for reporting qualitative research.<sup>14</sup> The study protocol was registered *a priori*.<sup>15</sup>

### Study setting

The study setting was the North East Ambulance Service National Health Service (NHS) Foundation Trust (NEAS) catchment area, which serves a population of more than 2.7 million people across Northumberland, Tyne and Wear, County Durham, Darlington and Teesside in the United Kingdom. Participants were sampled from community, primary and secondary care settings across

this region, reflecting the broad range of stakeholders the proposed change in EMS practice could impact.

### Sampling strategy

We aimed to sample up to 20 members of the public and up to 10 service providers across a range of professionals including paramedics and 'field experts' (ambulance service leads, cardiologists, GPs, public health leads, policymakers and commissioners). Sample sizes for the two participant groups were derived using the concepts of sample size sufficiency and data adequacy as markers of research rigour and the quality and trustworthiness of our findings.<sup>16</sup> Sample sizes in qualitative research cannot be estimated in advance with certainty, rather they are often decided on when planning a study using general advice or 'rule of thumb' guidance, researcher experience and expertise and consideration of empirical and pragmatic features intrinsic to the study at hand.<sup>16-18</sup> Core features that influenced our approach to sampling and the number of participants who could take part included finite funding and a limited timescale for completion of the study. We further wished to maximise the quality and richness of data that the study would generate, therefore achieving a broad diversity of professional and public perspectives in the data set was prioritised. This was facilitated using purposive sampling.<sup>19</sup> Members of the public were sampled to provide a balance of men and women, a range of ethnicities and a spread of age from 40 years and above. Patients with a history of AF were not specifically excluded. Paramedics were sampled to maximise the diversity of experience and responsibility, and field experts were sampled to maximise diversity across relevant clinical practice and expertise in public health, service management, commissioning, policy implementation and quality improvement.

All participants were required to speak English and to have the capacity to give consent to take part in the study. The aim of 'tailoring' our sampling choices in this way was to increase the potential for capturing rich and detailed data.<sup>16</sup> Three researchers (CW, GM, SM) determined data saturation by consensus during data analysis meetings.<sup>13 18 20</sup> Saturation was assessed on two dimensions: having reached maximum diversity in each participant group relative to the respective purposive sampling frame and when no new data, codes or conceptual insight were being generated, indicating adequate understanding of issues in the data had been reached.<sup>13</sup>

### Recruitment

Recruitment of members of the public was supported by local patient and public involvement research registers and networks (VOICE Global and Creating Connections).<sup>21 22</sup> A flyer was cascaded through these networks generating 26 expressions of interest. Based on age, gender and ethnicity, 20 of the 26 volunteers were purposely selected and invited to participate in an FG. Paramedics were recruited from within NEAS using internal communications. Policymakers, clinical specialists and commissioners

involved in decision-making and policy implementation of healthcare policies and services were identified and recruited via professional networks. No participants withdrew from the study.

### Data collection and analysis

Interviews and FGs were conducted online by SM (experienced qualitative researcher) between June and September 2022. A topic guide was used for consistency across interviews and FGs (online supplemental data). Written informed consent was obtained for all participants. Open-ended questions were used to maximise the information elicited from participants and reduce the risk of interviewer bias. FGs with members of the public lasted 90 min and began with a brief explanation of non-conveyance to hospital, what AF is, and the potential for an increased risk of stroke that could be managed with OAC; supported by two PowerPoint slides (online supplemental data). This was to contextualise discussion from the outset and to ensure that each FG got the same information. Audio recordings of the interviews and FGs were transcribed verbatim and anonymised. Transcripts were analysed thematically, following Braun *et al.*<sup>13 23</sup> A predominantly inductive approach was adopted during analysis, allowing themes to develop reflexively from the data gathered rather than being driven by a prior theoretical basis. Data were analysed by participant group initially to enable comparison across the three participant types for similarities and differences in perspective. Results are summarised across participant groups and presented as cross-cutting themes with respective subthemes and supporting verbatim quotes to demonstrate commonalities and nuanced differences in perspective. Microsoft Excel and Word software were used to support organisation, coding and analysis of the qualitative data.

### Patient and public involvement and engagement

Established local patient research support networks supported dissemination and promotion of the study and assisted in recruiting a diverse sample of members of the public from across the region. The study protocol and all public-facing materials (recruitment flyer and participant information leaflet) were reviewed by public involvement partners for clarity and accessibility. Public involvement partners also reviewed the FG topic guide and PowerPoint presentation explaining AF during an online workshop. Public participants were offered a gift voucher in acknowledgement of their time.

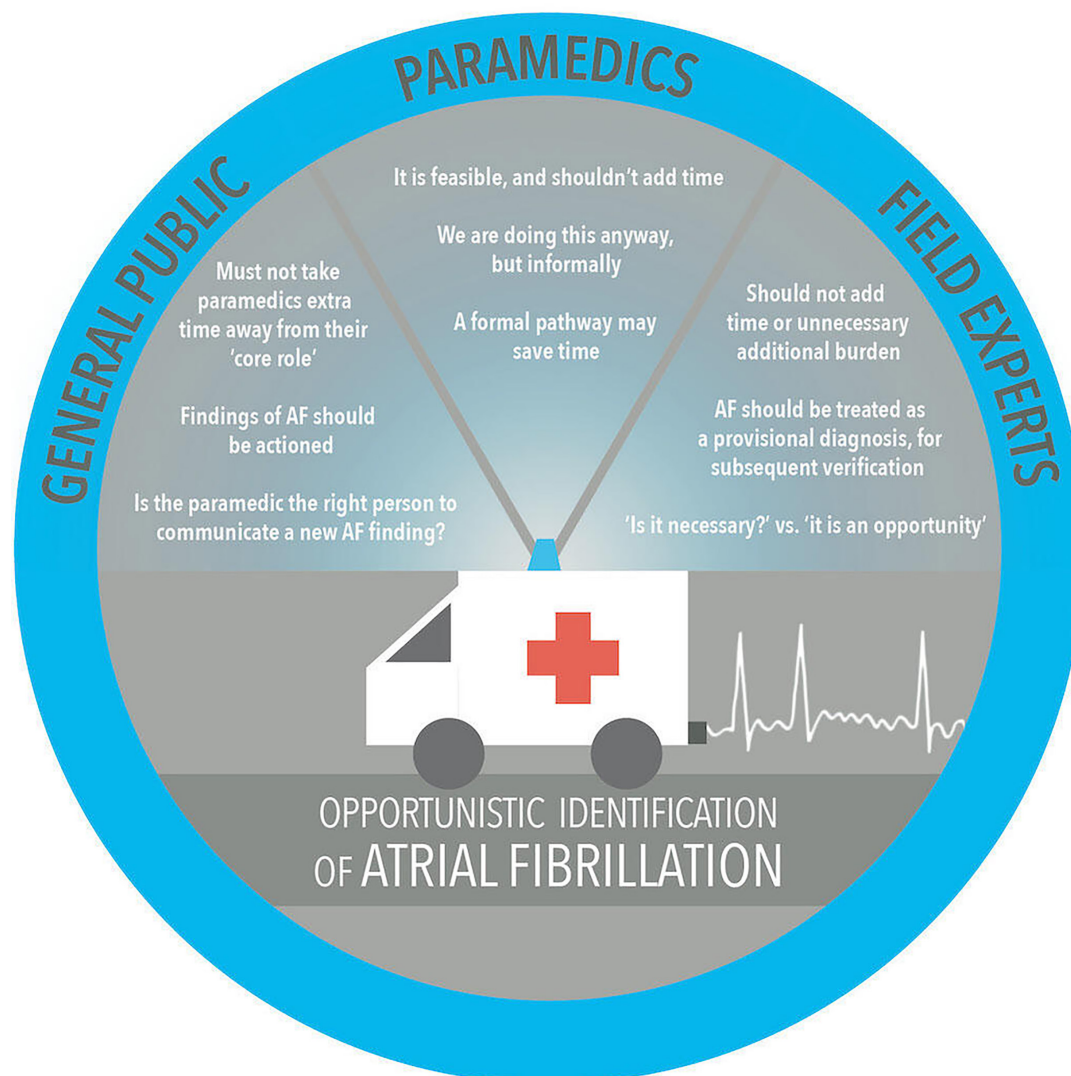
### RESULTS

20 members of the public consented to take part in an FG but two were later unable to join a session. Subsequently, 18 members of the public took part in one of four online FGs. Participants were from a range of ethnicities, and all had secondary school education or above. Their ages ranged from 41 years to 82 years (median 64 years). 12 (67%) were women. Eight (44%) reported living with a long-term condition, and five (28%) declared good health. One participant disclosed a diagnosis of AF. 11 professionals participated in one-to-one interviews—six paramedics (P) and five field experts (FEs). Paramedics ranged in experience (qualified for between 3 months and 16 years). Four (67%) were men, and three (50%) held a specialist role. All were familiar with the management of AF. The field experts provided varied expertise—and some occupied more than one relevant professional role including cardiology, general practice (GP), public health, academic research, healthcare policy and primary care commissioning. Four (80%)

**Table 1** Summary characteristics of study participants

Members of the public (n=18)		Paramedics (n=6)		Field experts (n=5)	
Sex	12 women Six men	Sex	Two women Four men	Sex	One woman Four men
Median age (range)	64 (41–82) years	Time qualified	Three long-term (5–16 years) Two short-term (1.5–3 years) One newly qualified (3 m)	Professional role	Two GP One cardiologist One academic research
Ethnicity	10 White British Five British Asian Three White European	Role	Three paramedic Three specialist paramedic	Areas of expertise (overall)	Public health Quality Improvement Healthcare policy Prevention Commissioning Atrial fibrillation Heart rhythm
Highest qualification	Five postgraduate Two undergraduate Six further education One high school Four not disclosed	Geographical location with NEAS patch	Two North Three Central One South		
Health status (self-reported)	Eight living with long-term conditions Six In good health Four Not disclosed				

NEAS, North East Ambulance Service.



**Figure 1** Summary of the perspectives of the public, paramedics and field experts on the opportunistic identification of atrial fibrillation (AF) by emergency medical services.

were men, and three (60%) had a specialist interest in AF (table 1).

Findings address the acceptability and feasibility of introducing a more formalised process of opportunistic screening for AF by EMS paramedics and any perceived barriers and facilitators to its implementation. While the proposal was generally seen to be both acceptable and feasible, each participant group identified important caveats (figure 1).

#### Considering a role for EMS in identifying AF as part of routine assessment

##### 'Paramedics are already doing it'

All participant groups were generally in favour of formalising the response to incidental identification of AF by paramedics. It was considered a simple intervention with the potential to reduce the risk of longer-term problems for patients, save money for the NHS in the future, complement primary care detection efforts and reduce the burden on urgent care. P reported that ECGs are recorded for most patients in the emergency setting,

including those who are not transferred to the hospital. AF was considered the most common ECG abnormality they found, being encountered multiple times on a shift. Though broad screening was not advocated by any participant group, public participants felt that it made sense for paramedics to look for and report incidental findings of AF since they were already doing an ECG as part of their routine patient assessment. Experts too recognised, that informally, paramedics are already doing opportunistic screening:

'I think it is a good idea, because if you are coming out to see somebody in the community and you are doing this as part and parcel of it, its just another check you can do.' (FG2)

'Within the service... [identifying AF] is something that we do on an informal basis at the moment.' (P9)

'I suspect they're doing a lot of it already anyway.' (FE1)

### 'There is a responsibility to act'

Paramedics held a strong sense of responsibility for the patient and shared a reluctance to leave patients in the community without some form of active handover. One paramedic reported that they would always transport patients with newly identified AF to the hospital for investigation even if they were asymptomatic, believing this to be Trust policy and that it is better to err on the side of caution. Others tended to contact the patient's GP directly and additionally complete a 'leaving at home' report, usually including a copy of the ECG. For patients who were not transferred to the hospital, the routine ECG was considered especially important by paramedics to ensure both patient safety and defensible clinical practice:

'I don't think we would ever leave someone with a newly found AF at home without at least ringing the GP and letting them know.' (P9)

'I tend to do an ECG as a belt and braces for leaving them at home to kind of protect my registration and to dot the i's and cross the t's.' (P8)

Notwithstanding cautions about unnecessary EMS burden, making sure incidental findings acted on were considered by experts to be in keeping with the NHS 'making every contact count' strategy,<sup>24</sup> and had potential to improve patient outcomes. Public and expert participants agreed that if an abnormality is picked up, then there is a responsibility to do something about it:

'I think we are all singing from the same hymn book really, we're all in agreement here ... if an ambulance comes out and they know someone's in AF, it would be criminal to ignore it ... something should be done, obviously' (FG4)

'Everybody would say 'well you've identified a potential problem, you should do something about it' and therefore since paramedics are doing tests that could identify accurately the presence of AF I believe that, if it is so identified, it should be reported, so that people can deal with it.' (FE4)

'I think at the end of it all you're down to the fact that if something is being picked up then there is a responsibility to do something about it and it's what's the right thing to do about it is what this research is fundamentally looking at.' (FE1)

### 'Communicating a new diagnosis of AF: Current reporting methods are insufficient'

On detecting an anomaly—incidentally or opportunistically—knowing what is the 'right thing to do about it' is currently a missing link for paramedics. Paramedics were not aware of guidance or a pathway for managing newly identified AF, particularly for patients who are to remain in the community rather than be conveyed to the hospital. Establishing whether AF is pre-existing can be difficult as patient awareness

of their AF is sometimes limited, and while their summary care record may be accessible for evidence of an existing diagnosis and any prescribed medication (eg, OAC), these data are not always available, and are often incomplete. Both paramedics and field experts considered that the current electronic clinical report was an insufficient method for alerting GPs to new AF as it may be buried in a lengthy report and subsequently missed by the GP resulting in a lack of follow-up. To address this concern, experts proposed that a new diagnosis was prominently flagged in the ambulance documentation that is shared with the GP, potentially with the ECG digitally attached. Beyond this simple intervention, there was no consensus on whether a new care pathway was needed. Parallels were drawn from the likely detection of other new findings such as raised blood sugars and raised blood pressure, and where there may be transferable learning. Public participants also suggested more prominent and direct flagging of an incidental diagnosis of AF to the GP, but there is currently no facility in the system to do this. There was broad support for formalising the process for informing GPs of new diagnoses of AF:

'I would hope that for these incidental findings and the patients who don't go to hospital, that we had an established pathway ... then I'd be happy that the patient can be more safely left in the community with an immediate follow up plan.' (P5)

'I would definitely flag it up to the GP surgery (and not only put it in a medical record, because they, very often, could just not be seen. They are very busy.' (FG2)

'When there's actions for the GP on the communication ... it must be barn door at the top of the letter 'The following letter contains actions for the GP'. It can't be an afterthought, or on paragraph 5.' (FE2)

### Formalising an appropriate response to opportunistic detection of AF

#### 'Opportunistic screening for AF must not create delays for EMS'

Despite broad support for formalising opportunistic screening, public and expert participants expressed a strong concern that this could take time for a busy workforce and was considered a secondary role for EMS. It was recognised by paramedics and experts that EMS managers would also need to be reassured that formalising the process would not create delays in the system. Both participant groups were clear that any change to current practice should not increase EMS time on scene and suggested that adapting existing systems was preferable:

'They are an emergency service ... they're not a mobile diagnostics service, so you know, could someone else possibly be dying while they were involved with a patient they don't think needs to go to hospital but have discovered they have AF?' (FG4)

'It needs to not create extra work for ambulances, and not create any delays ... it absolutely can't take them any longer... you're far better adapting a current line of communication rather than doing something new.' (FE3)

Reflecting on this concern, field experts estimated that relatively few people with new or untreated asymptomatic AF would be identified by paramedics, and that there could be overlap with existing community-based AF identification initiatives. Some questioned whether current processes for reporting incidental findings of AF were sufficient, and additionally expressed caution about progression from actioning an incidental finding towards a programme of opportunistic screening for AF by paramedics. Paramedics reported that a formalised pathway for notifying GPs would not increase their workload, since many are doing this already. It was further suggested that a formalised pathway may 'empower' some paramedics to engage with opportunistic identification of AF more confidently, particularly in people who engage infrequently with healthcare services:

'We're seeing people that maybe haven't seen a GP in a long time or they're not engaging with healthcare as they should... they might not get another opportunity to have an ECG or they might not consent to another opportunity.' (P8)

Paramedics further reported that in most cases there is a known history of AF, and identifying a new diagnosis of asymptomatic AF was uncommon.

#### 'Communicating a new diagnosis of AF: How best to inform the patient?'

Discussion about communicating the finding of AF to the patient dominated discussion in each FG. Public participants across the four FGs unanimously agreed that the patient had a right to know and should be told about the finding of AF, but they were divided on *when* and *how* this should be done and by *whom*. Those in favour of paramedics telling the patient 'there and then' felt that an informed patient may expedite follow-up, whereas not telling them may lead them to disregard future symptoms. While concerns were also driven by a desire not to delay paramedics unnecessarily, those opposed felt that the finding should 'go back to the GP' to act on to avoid additional anxiety and distress to the patient, especially since AF is a non-urgent, non-life-threatening issue, that may or may not benefit from intervention. Ultimately, since no compromise in position was reached, the general consensus was for consistency in approach:

'I don't think it can be expected of ambulance crews to make a judgment on who is told and who isn't told, so I think they should have a blanket approach to it, either they are going to tell the patient anything that they find or they're going to withhold it and flag it up for the doctor.' (FG3)

If information is to be shared by paramedics, there was consensus that this should aim to minimise anxiety while also motivating the patient to seek follow-up, and perhaps include written information and a copy of the ECG. Public participants also agreed that discussion of risk and treatment would be unnecessary as paramedics would not be treating incidental AF in the emergency setting. Since findings from hospital-based tests are routinely fed back to GPs, this was familiar and acceptable.

#### 'Getting the diagnosis right'

With the patient's well-being at the forefront, further reassurances sought by some public participants included that EMS was trained in AF identification and had sufficient experience in communicating new diagnoses with patients. Paramedics did not feel specific training was necessary as competence in making a diagnosis of AF was considered routine. However, refresher training may be useful for some to address any insecurities or reluctance to do so, and decision criteria would provide support to paramedics on scene:

'I would be really surprised if it actually is a topic that we would need to train paramedics to identify rhythm ... a rhythm diagnosis is very broad and butter for paramedics so I think that there shouldn't be any skills training. It would be about reducing the barriers for people to have these diagnosis discussions, and there might be a case for that. So it would all be soft skills rather than hands on skills.' (P7)

Having a brief explanation in the form of a leaflet or mobile phone quick-response (QR) code was proposed to aid patient communication by all participant groups and generally considered sufficient information for the patient at the point of EMS contact. Field experts additionally considered the potential personal implications of receiving a diagnosis of AF such as self-perception, changes in behaviour and impacts on life insurance and travel insurance. Getting the diagnosis right was therefore imperative, and they suggested that the diagnosis made by the paramedic is not necessarily the *definitive* diagnosis:

'So that's the first clinical question [...] am I (as a GP) confident that I can make that diagnosis of AF from this information, this ECG or not [...] to put AF on to this person's medical record, to stick with them for the rest of their life as a as a lifelong diagnosis, potentially expose them to the risks of anticoagulation, change their life insurance risk, etc? Because if the answer is 'yes, I am', then it's one pathway. If the answer is 'no, I'm not [...] then it's another pathway about repeating the ECG, getting the diagnosis right first.' (FE5)

## DISCUSSION

In a series of online FGs with members of the public and one-to-one interviews with healthcare and service

providers, we found clear support for ensuring that when AF is identified by EMS, that this is actioned, but that this should not delay ambulance staff who have more time-sensitive duties. Public participants disagreed about when (and by whom) a patient should be told about newly identified AF. All participant groups considered that provision of a succinct, brief explanation supported by written information would be sufficient. Underpinned by the concern that newly identified AF could be missed within current communication mechanisms with GPs, there was broad support for a simple, time-efficient mechanism for newly identified AF to be communicated to the GP, for them to consider further action.

Although EMS is under pressure, with response times in England at a record high,<sup>25</sup> there is an increasing recognition that EMS has an important role in providing holistic care outside clinical emergencies. Paramedics are an integral part of the primary care team in parts of the UK.<sup>26</sup> In Canada, a paramedic-led community-based health promotion programme to prevent diabetes, cardiovascular disease and falls for people aged 55 years or older that lived in subsidised housing led to a significant reduction in the number of emergency ambulance calls and improved blood pressure control.<sup>27</sup> In their more traditional EMS role, recent work has explored the potential of paramedics in recognising patients who are approaching the end of life and referring for advance care planning.<sup>28</sup> In Finland, the feasibility of EMS screening for nutritional status, fall risks and cognitive impairment was demonstrated for patients being non-urgently transported to the hospital.<sup>29</sup> The authors hypothesised that extending screening to patients who are not transported could be a valuable contribution to their care in the future.

There have been significant reductions in cardiovascular and cerebrovascular events for patients with AF over recent years, which attests to the progress made in cardiovascular and AF-specific care among patients who have been diagnosed with AF.<sup>30</sup> However, an estimated 500 000 people in the UK have undiagnosed AF, and so remain at elevated risk of stroke.<sup>4</sup> Indeed, as many as two people per day seen by the NEAS have AF identified by paramedics and are not prescribed OAC,<sup>11</sup> suggesting that EMS may have an important role in reducing the AF detection gap. A further group is known to have AF but is not prescribed OAC and so remains at elevated risk of stroke,<sup>31</sup> perhaps on the basis of factors such as frailty.<sup>32 33</sup> It is possible that there is a documented contraindication to anticoagulation, but flagging such patients to the GP may provide a useful opportunity to revisit the decision. This is important: in England, 4713 people were admitted with a stroke in 2020/2021 who had AF but were not anticoagulated.<sup>34</sup>

We currently lack evidence that there is clinical benefit in population-level screening for AF in asymptomatic adults,<sup>35 36</sup> although there was evidence of a net benefit to those who took up the opportunity to be screened for AF (and prescribed anticoagulation, if AF was identified) among adults aged 75 years or 76 years in Sweden.

There was an average reduction of 4% in the risk of the combined endpoint of ischaemic or haemorrhagic stroke, systemic embolism, bleeding leading to hospitalisation and all-cause death (HR 0.96 (95% CI 0.92 to 1.00);  $p=0.045$ ) for those in the intervention arm.<sup>37</sup> Further work is ongoing to further understand the association between AF, risk factors for stroke, OAC and clinical outcomes in a primary care population (for example, the Screening for Atrial Fibrillation with ECG to Reduce stroke [SAFER] Trial).<sup>38</sup> There is further uncertainty over whether AF that is identified in an ambulance carries the same clinical significance as in other settings, although a small case-control study showed that an episode of paroxysmal AF as an inpatient was associated with a ten times greater rate of documented AF at 12 months compared with matched controls (32.3% vs 3.0%).<sup>39</sup> The implications of this on stroke risk remain unclear.

It is possible that the complexity of the existing efficacy data in part explained why field experts were not unanimous that the addition of opportunistic EMS screening was a valuable addition to current provision. In this study, we focused on follow-up mechanisms for incidentally detected AF in a population that is potentially at a higher baseline risk than the general population due to being older and perhaps with a concomitant illness that led to an EMS call. The group is also likely to include populations that do not often engage with other health services, and therefore offer a valuable and unique opportunity for AF identification and treatment and potential impact on health inequalities.<sup>40</sup> In the UK, 100,000 people per year have a stroke, with an associated care cost of £26 billion,<sup>41</sup> and the morbidity, mortality and cost implications have made cardiovascular disease prevention a priority in the NHS Long Term Plan.<sup>42</sup> There is a need for innovative approaches to detect asymptomatic people, who do not realise they are at risk. The decision to start on OAC can then be made based on the latest evidence and individual preferences.

To the best of our knowledge, this is the first study to elicit the views of the public, paramedics, and field experts in the identification and follow-up of AF. There was a diverse range of participants, who provided rich and valuable insights into current practice and how improvements could be made, alongside potential barriers and facilitators from a range of perspectives. These could be useful insights to guide development of a pathway for improved care provision, and potentially be used more broadly for cardiovascular risk factor identification and management. However, the study was subject to limitations. Participants were required to speak English, which potentially excluded up to 3.5% of the eligible population.<sup>43</sup> The inclusion of briefing materials for the public group that included reference to the risk of stroke may have introduced bias in favour of an intervention—but this was considered necessary context to inform the discussion. The sample was self-selected and involved only one EMS Trust. Staff and patients in other organisational settings and localities are likely to operate under



different conditions and have had other experiences. Nevertheless, our findings benefit from in-depth exploration facilitated by tailoring sampling choices to key study features, including purposive selection to maximise diversity of participant voices, expertise and experience. Future research should focus on more accurately quantifying the burden of asymptomatic AF, including the stroke-risk profile of this population and a deeper exploration of current practice in ambulance Trusts across the UK and elsewhere. Qualitative work to understand how and when medical diagnoses should be communicated with patients in the prehospital setting is also warranted.

## Conclusions

Among members of the public, paramedics, and field experts, there was general support for a mechanism for newly identified AF opportunistically identified by EMS to be brought to the attention of primary care, provided this did not lead to substantial changes to existing practices or occupy additional staff time. A simple pathway was proposed that could 'flag' an apparently new diagnosis of AF to GPs to facilitate follow-up and consideration of OAC prescription, which now requires standardisation and real-world evaluation. This has the potential to improve the recognition and treatment of AF and reduce the risk of stroke.

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