Targeted atrial fibrillation detection in COVID-19 vaccination clinics

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Atrial fibrillation (AF) is estimated to cause at least a quarter of all ischaemic strokes, which tend to be more likely to result in death or significant impairment than strokes from other causes. The European Society of Cardiology recommends opportunistic detection of AF by pulse taking or electrocardiographic (ECG) rhythm strip in people aged ≥65 years, who are at particular risk of AF-related stroke, so that if AF is detected they can be considered for oral anticoagulation therapy. Improved identification of AF and treatment with oral anticoagulants of those at high risk has reduced the incidence of AF-related stroke. Despite considerable progress in detecting AF in recent years about 250 000 people in England are estimated to have undetected AF. It is estimated that one stroke will be prevented in the first year for every 5 000 people aged ≥65 years attending clinics for detection of AF based on the experiences and learnings across these clinics involves the following steps:

1. Identification of target group
2. Information and consent
3. Adherence to infection control measures
4. Performing the rhythm check
5. Explaining the result
6. Communicating positive results to GP or other nominated clinician.

Once the target group has been identified—typically patients aged 65 years due to the increased risk of stroke in this age group versus the benefits of anticoagulation in diagnosed AF—the pathway involves detecting an irregular pulse through a simple pulse check or a range of detection devices such as one-lead ECG, blood pressure monitors that detect an irregular pulse, or smartphone apps that use photoplethysmography. Pilot clinics that elected to use a single-lead ECG from a variety of available single-lead devices, which are simple to use by non-clinical or volunteer staff and have similar sensitivity to manual pulse checks but higher specificity, leading to fewer false positives. Patients with cardiovascular disease (CVD) and related comorbidities are also more likely to be severely affected by COVID-19 and to have worse outcomes, including a higher risk of mortality. In the absence of conventional case-finding opportunities during and potentially after the pandemic, alternative routes for identification of people with AF are needed.

The large numbers of people aged ≥65 years attending clinics for COVID-19 vaccinations, including potential booster injections, provides an unprecedented opportunity for targeted AF detection in this high-risk cohort. Some COVID-19 vaccination clinics in the UK developed various approaches to targeted AF detection during the initial phases of the vaccination programme. A generic pathway for detection of AF based on the experiences and learnings across these clinics involves the following steps:
COVID-19 vaccination are given information about the planned AF check before their appointment or when they arrive at the clinic, with verbal consent obtained before the rhythm check is carried out if they are not known to already have AF. In some centres, vaccinators perform the rhythm check while asking questions prior to giving the vaccine; in other centres, volunteers from the UK’s AF Association offer a rhythm check after the vaccination has been administered. Suspected AF after a single-lead ECG is confirmed via 12-lead ECG, in line with recommendations from the National Institute for Health and Care Excellence (NICE) in the UK. If AF is suspected after a manual pulse check, a second rhythm check with a single-lead ECG device has generally been used to reduce large numbers of false positives which may be generated by manual pulse checks referred for 12-lead ECG.

Two potential concerns were expressed by clinic staff and senior NHS management before introduction of AF checks. The first was that this would reduce the capacity of the clinics to administer vaccinations at high volume. Experience to date has not shown this to be the case through clear pathway design and ensuring assessments do not interfere with vaccine staff workflow practices. The second concern, particularly in the early stages was infection control and the potential risk of transmission of COVID-19. Cleaning protocols for single-lead devices are required with the support and approval of local infection control teams with no concerns raised from the pilot clinics studied to date.

Once AF is detected, clear arrangements for further management need to be in place, with the diagnosis and next steps explained to the patient, supported with an information leaflet. In UK clinics the patient has generally been referred to their GP, cardiovascular nurse, or pharmacist in accordance with a defined pathway. Arrangements include the vaccination clinic directly informing the GP; providing the patient with a letter to share with their GP; or referral to a defined secondary care clinic, after which the patient is transferred to their GP for continued care. Protocols need to be in place for further assessment of non-AF-related bradycardia or tachycardia, detected by single-lead ECG devices. In some pilot sites, primary care teams are offered additional support with anticoagulation, including initiation of drugs and counselling patients on the risks and benefits of anticoagulation and the importance of adherence.

These additional interventions for AF detection during vaccination clinics provide an excellent opportunity to offer CVD prevention advice. Some centres have taken the opportunity to provide information on CVD prevention through handing out A5 cards (an example flyer) or showing CVD promotional material on screens in waiting areas. Indeed, as NHS Health Checks that identify other CV risk factors have been paused or delayed during the pandemic, some...
vaccination clinics that embedded targeted AF detection have chosen to build further upon the model, also checking blood pressure and glycosylated haemoglobin. In one clinic, 10 potential cases of AF were identified among 2 259 patients, and 58 new cases of high blood pressure were identified among 459 people who were given a full NHS health check or general health assessment (n = 230) or had their blood pressure checked (n = 229).

A complete return to previous approaches to detect and manage AF and other CVD risk factors at the population level is unlikely in the short term given the shift to virtual consultation in primary care. New approaches will be needed to identify and treat people at increased CVD risk, particularly for communities with higher levels of socioeconomic deprivation, ethnic minority groups, and those with severe mental illness. Further work is needed to evaluate the effectiveness and cost-effectiveness of the different models of targeted AF detection in COVID-19 vaccination clinics. However, this generic pathway provides a pragmatic approach to targeted AF detection during the pandemic, which is feasible and acceptable for clinics and patients, can be adapted to suit local settings, and can be expanded to identify other risk factors for CVD.

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Data availability
Data provided by NHS Frimley CCG. Data available on request to the corresponding author with the permission of NHS Frimley CCG.

References
1. Hindricks G, Potpara T, Dagres N, Arabo E, Bax JJ, Blomström-Lundqvist C et al. 2020 ESC Guidelines for the diagnosis and management of atrial fibrillation developed in collaboration with the European Association for Cardio-Thoracic Surgery (EACTS): The Task Force for the diagnosis and management of atrial fibrillation of the European Society of Cardiology (ESC) Developed with the special contribution of the European Heart Rhythm Association (EHRA) of the ESC. Eur Heart J 2020;42:373–498.
2. Cowan JC, Wu J, Hall M, Orlowski A, West RM, Gale CP. A 10 year study of hospitalized atrial fibrillation-related stroke in England and its association with uptake of oral anticoagulation. Eur Heart J 2018;39:2975–2983.
3. Williams R, Jenkins DA, Ashcroft DM, Brown B, Campbell S, Carr MJ et al. Diagnosis of physical and mental health conditions in primary care during the COVID-19 pandemic: a retrospective cohort study. Lancet Public Health 2020;5:e543–e550.
4. Holt A, Galason GH, Schau M, Zareini B, Biering-Sørensen T, Phelps M et al. New-onset atrial fibrillation: incidence, characteristics, and related events following a national COVID-19 lockdown of 5.6 million people. Eur Heart J 2020;41:3072–3079.
5. Williamson E, Walker AJ, Bhaskaran K, Bacon S, Bates C, Morton CE et al. OpenSAFELY: factors associated with COVID-19-related hospital death in the linked electronic health records of 17 million adult NHS patients. medRxiv 2020: 2020.05.06.20092999.