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A randomised controlled trial comparing high frequency jet ventilation and conventional ventilation used in catheter ablation to establish whether using a breathing method that gives very small, rapid breaths during general anaesthetic, makes atrial fibrillation ablation more successful than the standard breathing machine currently used in most UK hospitals

Submission date 14/08/2026	**Recruitment status** Recruiting	[X] Prospectively registered [_] Protocol
Registration date 17/08/2026	**Overall study status** Ongoing	[_] Statistical analysis plan [_] Results
Last Edited 20/08/2026	**Condition category** Circulatory System	[_] Individual participant data [X] Record updated in last year

Plain English summary of protocol

Background and study aims

The heartbeat is controlled by a wave of electricity that sweeps over the muscle. In atrial fibrillation (AF), the electrical activity in the top chambers of the heart becomes chaotic and as a result the heartbeat becomes irregular. One of the major reasons for this is because the veins that come from the lungs and into the back of the left top chamber can give off extra beats. These can travel abnormally into the heart triggering AF.

When we treat AF with a procedure called ablation, we are aiming to stop the extra beats from the veins getting into the heart. To do this we make a ring of burns in the surrounding tissue, which scars and forms a kind of fence to electricity. The burns need to be carefully placed, which is all done with catheters through the tube inserted at the top of the leg.

One of the problems that we encounter in making the burns is that our tubes and wires inside the heart are constantly moving. This is especially the case during breathing, because the heart is inside the chest. Having a general anaesthetic helps a bit with this movement, because breaths are delivered by the ventilator and are more predictable, but the catheters are still moving whilst making the burns. The movement results in more chance of gaps in the fence, and therefore more chance of AF coming back in the future.

A potential solution to this problem is to ventilate the lungs in a different way. Instead of large breaths like normal breathing, tiny breaths can be used but much more quickly. This allows the lungs to receive all the oxygen they need without moving the chest – it is called High Frequency Jet Ventilation (HFJV). HFJV has been safely used for a long time, mostly in children and delicate surgery on the vocal cords as it needs different machines and specialist anaesthetists. Research strongly suggests that HFJV increases the stability of ablation catheters, and early work suggests this might mean less AF in the future.

To justify the increased costs of making HFJV more available in the NHS, we need to prove HFJV works better for patients by comparing it to standard ventilation. However, it is not enough to just observe what happens to people we use it on routinely. This is because doctors can bias the results by making decisions on who to use it on. This tends to mean that new technologies get used on patients who doctors expect to have easier procedures. The only way to overcome this is allow a computer to randomly decide who will get HFJV or standard ventilation. With enough people in the study, this will mean both groups getting the different ventilators will be similar, allowing a fair comparison. This is what the JET-VIP AF trial will do. We will follow you up a bit more closely to ensure we accurately find who gets AF again, this will be done using a wearable heart rhythm monitor.

Who can participate?
Patients having their first ablation within the NHS for AF that either comes and goes (paroxysmal AF), have got stuck in AF recently (early persistent AF), or have held in the normal rhythm after a cardioversion may be eligible for the trial.

What does the study involve?
-Identifying and inviting participants
Potential participants will be identified by their usual NHS care team from clinic lists, ablation waiting lists or pre procedure clinic appointments. They may be approached in clinic or sent information before a routine appointment. Participation is voluntary, and declining will not affect their usual NHS care.

-Consent visit - 3 months to 1 week before ablation
Participants will have the study explained to them in person, by telephone or by video call. They will have time to read the participant information, ask questions and decide whether to take part. Written consent will be taken electronically or on paper.

At this stage, the research team will check eligibility. They will collect relevant background information such as age, sex, gender, ethnicity, medical history and current medicines. A standard care 12-lead ECG will be obtained where available and uploaded to the trial database. The participant's GP will be informed that they are taking part.

Participants will be given a PulseOn wearable heart rhythm monitor and shown how to use it. They will be asked to wear it as much as possible before and after ablation. This allows them to become familiar with the device before the procedure and provides information about their heart rhythm before ablation. The PulseOn watch continuously monitors heart rate and rhythm. Participants will also be asked to record a single lead ECG once each day at a convenient time, and to record additional ECGs if the device prompts them or if they
develop symptoms. Data can be uploaded using a smartphone where participants prefer this, or through a gateway device for participants who do not have, or do not wish to use, a smartphone or home internet connection.

Participants will also be asked whether they agree to optional blood sample storage for future mechanistic research. This is optional and is not required to take part in the main trial.

-Baseline assessment: day of ablation, before the procedure
On the day of ablation, participants will be asked to confirm verbally that they still wish to take part. They will have another opportunity to ask questions.

Before the procedure, participants will complete questionnaires about AF symptoms and quality of life. The research team will check for any changes in medicines or relevant clinical information. Clinical staff will record a frailty score. Routine pre-procedure blood tests and a cannula will be taken as part of standard care. If the participant has agreed to optional sample storage, an additional blood sampled will also be collected.

-Randomisation
Participants will be randomly allocated to either HFJV or IPPV on the day of ablation, or as close to the ablation procedure as possible. Allocation information will be restricted so that participants and follow-up assessors do not know which ventilation strategy the participant was allocated to.

Staff who know the allocation during the procedure will not carry out trial follow-up assessments for that participant.

-Ablation procedure
All participants will have their AF ablation under general anaesthetic. While the participant is awake, the standard ventilator will be used for preoxygenation. The participant will then be anaesthetised. Once they are unconscious, the anaesthetic team will switch to the allocated ventilation method: either HFJV or IPPV. Both types of ventilator will be present in the catheter laboratory, and ventilator branding will be covered.

The ablation itself will be performed according to usual NHS practice with a point-by-point approach. Thin tubes will be passed through blood vessels into the heart, and energy will be used to treat areas involved in triggering AF. During and after the procedure, the team will record information about the procedure and ensure electroanatomical mapping data from the procedure is stored so that catheter stability can be analysed later. Before discharge, participants will complete a questionnaire about their satisfaction with the anaesthetic and recovery experience.

-After discharge and ongoing monitoring
After ablation, participants will continue wearing the PulseOn monitor for 12 months. Heart rhythm data will be reviewed for trial and safety purposes.

Participants will attend routine follow-up appointments at 3 and 12 months after their ablation. The team will ask about medical events since the procedure and clinical notes will also be reviewed for safety information. Participants will complete questionnaires about AF symptoms, quality of life, which ventilation strategy they think they were allocated to, and acceptability of the heart rhythm monitor (at 12 month visit only). A standard care 12-lead ECG will be uploaded to the trial database where available.

At the 12 month visit participants will return the PulseOn wearable heart rhythm monitor. They will be offered a £25 voucher when the device is returned.

What are the possible benefits and risks of participating?
Direct benefits of taking part are not guaranteed because we don't yet know whether HFJV is more effective or not. By taking part, participants may also receive slightly more follow-up monitoring than they usually would have, though this will not directly benefit them in most circumstances. Participants will receive a £25 voucher on return of the PulseOn as a token of appreciation. The main benefit is that AF ablation might be improved in future for other patients and this might additionally reduce costs for the NHS.

There are potential complications that can occur from general anaesthetic and the ablation procedure that are part of standard NHS care and are not specific to the trial. The local healthcare team will discuss these with participants. The risks from participation in the trial are considered low. HFJV has been used in other NHS settings for a long time and is considered safe. We do not yet know whether one approach is safer or more effective than the other. Some studies have suggested that it can be a little harder to control the levels of carbon dioxide and oxygen in the blood and the blood pressure during HFJV, so we will monitor this. Equally, other studies have suggested that ablation using HFJV might reduce the risk of damage to the heart as equipment is easier to control. When HFJV has been used for other procedures such as surgery on the airway or ventilating babies there have been cases of collapsed lung (pneumothorax) resulting from a build up of pressure in the lung. This has not been seen to be a problem when used in cardiac ablation surgery.

We appreciate that there is a higher burden of inconvenience placed on study participants compared with NHS care. This is in the form of:
- Additional questionnaires
- Long-term use of the PulseOn monitor including providing a daily ECG
- The possibility of AF detection alerts which might cause anxiety

Where is the study run from?
The study is run in England, across multiple hospital sites and led by the Norfolk and Norwich University Hospital.

When is the study starting and how long is it expected to run for?
September 2026 to March 2029.

Who is funding the study?
The study is funded by the National Institute for Health and care Research (NIHR). The NIHR is a government funded research organisation that supports the NHS and is directly accountable to the Department of Health and Social Care.

Who is the main contact?
Chief Investigator: Dr Gareth Matthews, Gareth.Matthews@uea.ac.uk
Trial Manager: Ania Spurdens, jetvipaf.trial@uea.ac.uk

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Type(s)
Scientific, Principal investigator, Public

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Central Portfolio Management System (CPMS)
65901

Study information

Scientific Title
Comparison of high frequency JET ventilation Versus conventional Intermittent Positive pressure ventilation on the effectiveness of catheter ablation for Atrial Fibrillation: a multicentre, double blinded, randomised controlled trial (JET-VIP AF)

Acronym
JET-VIP AF

Study objectives

Ethics approval required
Ethics approval required

Ethics approval(s)

Approved 12/08/2026, Wales Research Ethics Committee 3 (Health and Care Research Wales Floor 4, Crown Building, Cardiff, CF10 3NQ, United Kingdom; -; Wales.REC3@wales.nhs.uk), ref: 26/WA/0193

Primary study design
Interventional

Allocation
Randomized controlled trial

Masking
Blinded (masking used)

Control
Active

Assignment
Parallel

Purpose
Treatment

Study type(s)

Health condition(s) or problem(s) studied
Atrial fibrillation, paroxysmal atrial fibrillation, early persistent atrial fibrillation, general anaesthesia

Interventions
This multicentre randomised controlled trial will compare high-frequency jet ventilation (HFJV) with conventional intermittent positive-pressure ventilation (IPPV) during general anaesthesia for first-time point-by-point catheter ablation in adults with symptomatic paroxysmal or early persistent atrial fibrillation.

A total of 316 participants will be recruited from an expected 11 UK tertiary arrhythmia centres and allocated in a 1:1 ratio to one of the two ventilation strategies. Participants and outcome assessors will be blinded to treatment allocation. All participants will undertake remote wearable heart-rhythm monitoring before ablation and for 12 months after the procedure.

-HFJV is a ventilation strategy delivering sub-dead-space tidal volumes at high respiratory frequencies during general anaesthesia. It will be used during catheter ablation with the aim of reducing respiratory movement during lesion delivery.

-IPPV, also known as conventional mechanical ventilation, is the standard ventilation strategy used during general anaesthesia, involving delivery of physiological tidal volumes at conventional respiratory frequencies.

All participants will use a wrist-worn monitoring system that continuously assesses heart rate and rhythm using photoplethysmography and permits confirmatory single-lead electrocardiogram recordings. Participants will complete a daily recording, symptom-triggered

recordings and device-prompted recordings. Monitoring will begin up to three months before ablation and continue for 12 months after the procedure.

Randomisation will be completed using the study database, REDCap. Randomisation will occur as close as practicable to the participant's ablation procedure, normally on the day of the procedure or up to three days beforehand where required for staffing and equipment arrangements. The allocated ventilation strategy will be started only after induction of general anaesthesia, thereby helping to preserve participant blinding.

Intervention Type
Device

Phase
Phase III

Drug/device/biological/vaccine name(s)
High Frequency Jet Ventilation - TwinStream ventilator

Primary outcome(s)
1. Quality of life measured using Atrial Fibrillation Effect on Quality-of-Life (AFEQT) questionnaire at baseline and 12 months after ablation

2. Proportion of participants with no episode of atrial fibrillation, atrial flutter or atrial tachycardia lasting more than 30 seconds measured using remote wearable rhythm monitoring at the post-ablation blanking period (8 weeks) through 12 months after ablation

Key secondary outcome(s)
1. Proportion of participants experiencing a composite of all-cause death, non-fatal ischaemic or haemorrhagic stroke, transient ischaemic attack, systemic arterial embolism, resuscitated or aborted cardiac arrest, incident heart failure, myocardial infarction, or hospitalisation for any cardiac cause measured using patient records at baseline through 12 months

2. Proportion of participants with no episode of atrial fibrillation, atrial flutter or atrial tachycardia lasting more than one hour measured using remote wearable rhythm monitoring at the post-ablation blanking period through 12 months after ablation

3. Atrial arrhythmia burden measured using percentage of analysable monitoring time spent in atrial fibrillation, atrial flutter or atrial tachycardia. Calculated as the total cumulative duration of atrial arrhythmia divided by total analysable monitoring time. Total episode count and cumulative episode duration will also be reported at ablation through 12 months after ablation

4. Proportion of participants listed for a further atrial fibrillation ablation procedure measured using clinical record review, participant report and follow-up clinician assessment at baseline through 12 months

5. proportion of participants who restart antiarrhythmic medication measured using clinical record review, participant report and follow-up clinician assessment at baseline through 12 months

6. Patient satisfaction with anaesthesia measured using the Bauer anaesthesia satisfaction questionnaire at the ablation procedure and before hospital discharge, generally day 0 or day 1

7. Within-trial cost-effectiveness measured using incremental NHS costs and quality-adjusted life years associated with high-frequency jet ventilation compared with conventional ventilation. Quality-adjusted life years will be derived from EQ-5D-5L assessments. Results will include incremental cost, incremental quality-adjusted life years and incremental cost per quality-adjusted life year gained at baseline through 12 months

Completion date
31/03/2029

Eligibility

Key inclusion criteria
1. Symptomatic paroxysmal atrial fibrillation or early persistent atrial fibrillation. Early persistent atrial fibrillation is defined as persistent atrial fibrillation of less than six months' duration, or maintenance of sinus rhythm for more than three months while receiving antiarrhythmic medication
2. Scheduled for first atrial fibrillation ablation using a point-by-point approach
3. Aged 18 or older
4. Able to provide informed consent

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
18 Years

Upper age limit
120 Years

Sex
All

Total final enrolment
0

Key exclusion criteria
1. Body mass index greater than 40 kg/m²
2. Congenital heart disease
3. Life expectancy of less than five years
4. Planned or recent cardiothoracic surgery
5. Hypertrophic cardiomyopathy
6. Significant frailty, defined as a Rockwood Clinical Frailty Scale score greater than 5
7. Clinical requirement for strict carbon dioxide control, including severe pulmonary hypertension or intracranial hypertension
8. Risk of pressure-related lung injury due to severe chronic respiratory disease, including severe chronic obstructive pulmonary disease
9. Pregnancy or breastfeeding

10. Participation in another clinical trial with incompatible outcomes or an unacceptable combined participant burden
11. Planned use of a single-shot or balloon-based ablation technology

Date of first enrolment
01/09/2026

Date of final enrolment
31/03/2028

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Norfolk and Norwich University Hospitals NHS Foundation Trust
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Sponsor information

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Norfolk and Norwich University Hospitals NHS Foundation Trust

ROR
https://ror.org/01wspv808

Funder(s)

Funder type

Funder Name
National Institute for Health and Care Research

Alternative Name(s)
National Institute for Health Research, NIHR Research, NIHRresearch, NIHR - National Institute for Health Research, NIHR (The National Institute for Health and Care Research), NIHR

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not expected to be made available