

Effectiveness of electronic cigarettes compared with combination nicotine replacement therapy for smoking cessation in patients with chronic obstructive pulmonary disease and effect on lung health (ECAL Trial).

Submission date 03/05/2023	Recruitment status Recruiting	<input checked="" type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol
Registration date 04/10/2023	Overall study status Ongoing	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
Last Edited 20/08/2025	Condition category Respiratory	<input type="checkbox"/> Individual participant data <input checked="" type="checkbox"/> Record updated in last year

Plain English summary of protocol

Background and study aims

Chronic obstructive pulmonary disease (COPD) is a common lung condition which mainly affects adults aged 35 years and older, and it is most often caused by smoking. COPD symptoms tend to get gradually worse over time and can limit normal activities. Smoking speeds up the progression of COPD but it can be extremely hard to quit, and people with COPD tend to have a greater dependence on nicotine. There are several different treatments available that increase people's chances of successfully quitting smoking; however, many people still relapse back to smoking. Electronic cigarettes (e-cigs) are not currently available on NHS prescription but could help COPD patients to quit smoking. Our goal with this research is to find out how effective e-cigs are compared with combination NRT in helping COPD patients quit smoking cigarettes, and which treatment is more cost-effective for the NHS. The data collected during this trial will also be used to inform a lung health sub-study and wellbeing sub-study. The lung health sub-study will look at the effects of switching to vaping on clinical, physiological and cellular measures of lung health between vapers, continued smokers and quitters. The well-being sub-study will look at the effect of switching to vaping on anxiety, depression and social quality of life compared to those who smoke and quitters.

Who can participate?

People aged 35 years and older who have been identified from selected GP practices and NHS hospitals in England, Wales and Scotland, diagnosed with COPD and are current smokers who want to try to stop smoking

What does the study involve?

This multi-centre trial will invite potentially eligible patients identified from selected GP practices and NHS hospitals in England, Wales and Scotland. Trial participants will be followed up for 1 year. All participants will be asked to have two face-to-face clinic visits to undertake

lung function tests and blood tests. Participants will also receive behaviour support calls from a smoking cessation advisor at set time points through the follow-up period.

What are the possible benefits and risks of participating?

All participants will receive support to stop smoking. There is a potential that participants may be successful in quitting smoking and see an improvement in their health. The products used in this trial are widely used for smoking cessation in standard practice and can be bought over the counter. Participants have no higher risk of side effects than if they were to receive either treatment as part of standard care. The use of nicotine-containing products can result in mild side effects and the main participant information sheet (PIS) advises of these and explains what to do/ who to contact if they experience issues. The participants' GPs will be notified about their participation in the trial, and they will be advised to monitor their patients whilst they try to quit smoking.

Where is the study run from?

University of Birmingham (UK)

When is the study starting and how long is it expected to run for?

September 2022 to December 2026

Who is funding the study?

National Institute for Health and Care Research (NIHR) (UK)

Who is the main contact?

Birmingham Clinical Trials Unit, ECAL@trials.bham.ac.uk (UK)

Study website

<https://www.birmingham.ac.uk/research/bctu/trials/primary-care/ecal>

Contact information

Type(s)

Principal Investigator

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Additional identifiers**EudraCT/CTIS number**

Nil known

IRAS number

1006828

ClinicalTrials.gov number

Nil known

Secondary identifying numbers

RG_20-120, IRAS 1006828, CPMS 56604

Study information

Scientific Title

Effectiveness of electronic cigarettes compared with combination nicotine replacement therapy for smoking cessation in patients with chronic obstructive pulmonary disease and effect on lung health (ECAL Trial).

Acronym

ECAL trial

Study objectives

To investigate the effectiveness and cost-effectiveness of Electronic Cigarettes for quitting smoking compared with combination Nicotine Replacement Therapy as an aid to smoking cessation.

To explore change in lung and mental health in people who switch to vaping compared with people who quit smoking without vaping, and people who continue to smoke.

Ethics approval required

Ethics approval required

Ethics approval(s)

Approved 03/10/2023, North East - Newcastle & North Tyneside 2 Research Ethics Committee (2 Redman Place, Stratford, London, E20 1JQ, United Kingdom; +44 (0)207 104 8086; newcastlenorthtyneside2.rec@hra.nhs.uk), ref: 23/NE/0102

Study design

Multicentre two-arm randomized controlled trial with embedded cost-effectiveness and cohort analyses

Primary study design

Interventional

Secondary study design

Randomised controlled trial

Study setting(s)

Community, GP practice, Hospital, Telephone

Study type(s)

Prevention, Efficacy

Participant information sheet

Not available in web format, please use the contact details to request a participant information sheet

Health condition(s) or problem(s) studied

Chronic obstructive pulmonary disease (COPD)

Interventions

Intervention arm: Electronic Cigarettes (EC) - At the baseline visit, participants will be given an EC starter pack and an initial supply of e-liquid (up to 20 mg nicotine/ml). Participants will be provided with instructions on how to continue sourcing further supplies themselves from reputable vendors in their preferred nicotine strength and flavours.

Comparator arm: Combination Nicotine Replacement Therapy (NRT) - Participants will receive up to a 12-week supply of a nicotine patch plus a fast-acting nicotine product to be used in combination. Participants who do not wish to use patches (e.g. due to previous experience with skin irritation) will be offered two types of fast-acting products.

Telephone behavioural support: All participants (intervention and comparator arm) will be advised at the baseline visit that they will receive six weekly behavioural support telephone calls from stop-smoking advisors which will commence within a few days of the baseline visit. During these calls, the advisor will deliver behavioural support according to the National Centre for Smoking Cessation Training Standard Programme including setting a TQD and providing further support around medication use.

Intervention Type

Drug

Pharmaceutical study type(s)

Pharmacoeconomic, Prophylaxis, Therapy

Phase

Phase III

Drug/device/biological/vaccine name(s)

Electronic cigarettes with e-liquid (up to 20 mg nicotine/ml), nicotine patch, fast-acting nicotine product

Primary outcome measure

Abstinence from smoking since target quit date (TQD) biochemically validated (exhaled CO<8ppm), defined in accordance with the Russell Standard. This will be measured with a questionnaire and exhaled carbon monoxide measurement at 52 weeks post-TQD

Secondary outcome measures

1. Abstinence from smoking for at least 26 weeks biochemically validated (exhaled CO<8ppm) measured using a questionnaire at 52 weeks
2. 7-day point prevalence abstinence from smoking biochemically validated (exhaled CO<8ppm) measured using a questionnaire at 52 weeks
3. Self-reported abstinence from smoking for at least 26 weeks measured using a questionnaire at 52 weeks
4. Self-reported 7-day point prevalence abstinence from smoking measured using a questionnaire at 4, 26 and 52 weeks
5. Reduction in cigarettes smoked (self-report of any and > 50% reduction) from baseline to 52 weeks measured using a questionnaire, confirmed by reductions in expired CO readings at 52 weeks
6. Reduction in cigarettes smoked (self-report of any and > 50% reduction) from baseline to 26 /52 week measured using a questionnaire
7. Continued use of the allocated product measured using a questionnaire at 4, 26 and 52 weeks
8. Withdrawal symptoms and urges to smoke (change from baseline to 1/2/3/4 week) measured

using the mood and physical symptom scale (MPSS)

9. COPD Symptoms (change from baseline to 4/26/52 week) measured using COPD Assessment Test (CAT) and the Clinical COPD Questionnaire (CCQ)

10. Number of COPD exacerbations over the past 52 weeks (change from baseline to 52 weeks) measured using a questionnaire

11. Number of self-reported upper respiratory tract over the past 52 weeks (change from baseline to 52 weeks) measured using a questionnaire

12. Post bronchodilator spirometry (FEV1, FVC and MMEF change from baseline to 52 weeks). Forced Expiratory Volume in 1 Second (FEV1): The maximal volume of air that can be expired in the first second of a forced expiration from a position of full inspiration (measured in Litres (L) and also expressed as the % predicted for age, sex, height and race). Forced Vital Capacity (FVC): The maximal volume of air that can be expired during a forced and complete expiration from a position of full inspiration (measured in L and % predicted). Mean Mid-Expiratory Flow (MMEF): The average flow between 25% and 75% of the FVC manoeuvre (measured in L/sec and % predicted).

Health economic outcomes:

1. Health-related quality of life (EQ-5D-5L) measured using a questionnaire change from baseline to 4/26/52 weeks

2. Use of healthcare resources and costs measured using a questionnaire at 26 and 52 weeks

3. Cost-effectiveness based on cost per quitter and cost per Quality-Adjusted Life-Year (QALY) at 52 weeks, and modelled cost per QALY over a patient's lifetime

Overall study start date

01/09/2022

Completion date

31/12/2026

Eligibility

Key inclusion criteria

1. COPD diagnosis previously confirmed by post-bronchodilator spirometry (FEV1/FVC <0.7), any GOLD stage

2. Current smoker (≥5 cigarettes per day)

3. Motivated to stop smoking

4. Aged 35 or over

Participant type(s)

Patient

Age group

Adult

Lower age limit

35 Years

Sex

Both

Target number of participants

Key exclusion criteria

1. Unable to perform spirometry to a satisfactory standard (e.g. due to dementia, lack of teeth, lack of coordination or not having a good oral seal)
2. Deemed as unsuitable to participate in the trial (e.g. terminal illness, unable to give informed consent)
3. Unable to participate in behaviour support calls
4. Severe angina or unstable cardiovascular disease
5. History of end stage kidney disease
6. History of cirrhosis of the liver
7. Currently taking NRT, bupropion, varenicline or ECs to stop or reduce smoking
8. Currently taking part in another trial of smoking cessation or COPD treatment/management
9. COPD exacerbation or inpatient hospital stay within the last 8 weeks (invite back and re-assess after 8 weeks)
10. Contraindications to spirometry within the last 12 weeks – tuberculosis infection, cardiac infarction, retinal detachment or surgery on the chest, abdomen, brain, ears or eyes (invite back and re-assess after 12 weeks)

Date of first enrolment

26/06/2024

Date of final enrolment

30/09/2025

Locations**Countries of recruitment**

England

Scotland

United Kingdom

Wales

Study participating centre

University Hospitals Birmingham NHS Foundation Trust

Queen Elizabeth Hospital

Mindelsohn Way

Edgbaston

Birmingham

United Kingdom

B15 2GW

Study participating centre

Leeds Teaching Hospitals NHS Trust

St. James's University Hospital
Beckett Street
Leeds
United Kingdom
LS9 7TF

Study participating centre**Gateshead Health NHS Foundation Trust**

Queen Elizabeth Hospital
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NE9 6SX

Study participating centre**The Shrewsbury and Telford Hospital NHS Trust**

Mytton Oak Road
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Sponsor information

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Sponsor type

University/education

Website

<http://www.birmingham.ac.uk/index.aspx>

ROR

<https://ror.org/03angcq70>

Funder(s)

Funder type

Government

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

Publication and dissemination plan

1. Peer reviewed scientific journals
2. Conference presentation
3. Publication on website
4. Other publication

Intention to publish date

01/07/2026

Individual participant data (IPD) sharing plan

The data-sharing plans for the current study are unknown and will be made available at a later date

IPD sharing plan summary

Available on request