

# Helping pregnant smokers quit: a multi-centre study of electronic cigarettes and nicotine patches

<b>Submission date</b> 20/03/2017	<b>Recruitment status</b> No longer recruiting	<input checked="" type="checkbox"/> Prospectively registered
<b>Registration date</b> 21/03/2017	<b>Overall study status</b> Completed	<input type="checkbox"/> Protocol
<b>Last Edited</b> 17/06/2025	<b>Condition category</b> Mental and Behavioural Disorders	<input type="checkbox"/> Statistical analysis plan
		<input checked="" type="checkbox"/> Results
		<input type="checkbox"/> Individual participant data

## Plain English summary of protocol

### Background and study aims

Smoking in pregnancy remains an unresolved issue. Quit rates in pregnant smokers are low and advice by doctors and nurses, even when combined with behavioural support and nicotine replacement treatment (NRT), has only a limited effect. NRT (e.g. nicotine patch) has shown little effect most likely because pregnant women use them very little. Pregnant women also use up nicotine faster, and standard NRT doses may be too slow and too low for them. Nicotine patches also do not allow the dose to be tailored to smokers' needs. Electronic cigarettes (EC) may overcome these limitations. ECs allow flexible dosing and have a faster effect than NRT. They also provide some of the sensations and enjoyment that smokers get from smoking. These characteristics should ensure better treatment uptake. It is estimated that in the UK half a million smokers have switched from smoking to vaping (EC use) so far, with some 20,000 quitting smoking with the help of EC per year who would not have quit otherwise. The EC must therefore be tested as a stop-smoking treatment for pregnant women, but the safety of such treatment needs to be addressed. ECs do not contain most of the chemicals responsible for health risks of smoking and those that are present are there at levels much lower than those present in cigarette smoke. The overall risks of EC use are estimated to be 95% less than risks of smoking. No chemicals other than nicotine have been identified in EC vapour that would be expected to affect the health of the baby. NRT is universally used by the UK pregnancy stop smoking services because pregnant smokers are consuming nicotine anyway and because the harm to the baby is also caused by other chemicals in tobacco smoke which are absent in NRT. The same logic applies to nicotine intake from ECs. The safety concerns are reduced by the fact that ECs would be used as a replacement for cigarettes which pose well known dangers. If there is any sign of an increased risk, the study can be stopped. If such use involves risks, evidence of this would have important practical implications. The aim of this study is to find out whether ECs are more effective at helping pregnant women to quit smoking than NRT.

### Who can participate?

Women aged 18 or over, who are 12 to 24 weeks pregnant, smoke daily and want help with stopping smoking

What does the study involve?

Participants are randomly allocated to use either an EC or nicotine patches. The products are posted out to participants, and they are called by a stop smoking advisor shortly after to check they know how to use the product and to set a quit day. The advisor then calls the participant weekly for a further 5 weeks to provide support and check on their progress. Participants are followed up at the end of their pregnancy and also at 3 months after birth. Smoking quit rates and side effects from the two treatments are compared at end of pregnancy and at 3 months after birth.

What are the possible benefits and risks of participating?

The benefit to participants is that taking part may help them to stop smoking, improving not only their health, but also the health and wellbeing of their baby. A positive result would also provide a new, inexpensive, and practical way to tackle an important and so far unresolved problem. No risks to participants are expected. Nicotine patches are approved to be used in pregnancy, and ECs do not pose any risks greater than cigarettes, which participants are already smoking.

Where is the study run from?

Queen Mary University of London (UK)

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

May 2017 to November 2020 (updated 14/04/2021, previously: April 2021)

Who is funding the study?

NIHR Health Technology Assessment Programme (UK)

Who is the main contact?

Dr Dunja Przulj

## Contact information

**Type(s)**

Scientific

**Contact name**

Dr Dunja Przulj

**Contact details**

Health and Lifestyle Research Unit  
Queen Mary University of London  
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London  
United Kingdom  
E1 4AH

## Additional identifiers

**EudraCT/CTIS number**

2017-001237-65

**IRAS number****ClinicalTrials.gov number**

Nil known

**Secondary identifying numbers**

011822; HTA 15/57/85

## **Study information**

**Scientific Title**

Helping pregnant smokers quit: a multi-centre RCT of electronic cigarette and nicotine patches

**Acronym**

PREP

**Study objectives**

Smoking in pregnancy remains an unresolved issue. Quit rates in pregnant smokers are low and advice by doctors and nurses, even when combined with behavioural support and nicotine replacement treatment (NRT) has only limited efficacy. NRT has shown little effect most likely because pregnant women use them very little. Pregnant women also metabolise nicotine faster and standard NRT doses may be too slow and too low for them. Nicotine patches also do not allow dosing tailored to smokers' needs.

Electronic cigarettes (EC) may overcome these limitations. EC allow flexible dosing and have a faster effect than NRT. They also provide some of the sensations and enjoyment that smokers get from smoking. These characteristics should ensure better treatment adherence.

The trialists hypothesise that EC may be more effective in helping pregnant women to quit smoking than NRT.

More details can be found at: <https://www.journalslibrary.nihr.ac.uk/programmes/hta/155785/#/>

**Ethics approval required**

Old ethics approval format

**Ethics approval(s)**

London- South East Research Ethics Committee, 29/06/2017, REC ref: 17/LO/0962

**Study design**

Multi-centre open-label randomized controlled trial

**Primary study design**

Interventional

**Secondary study design**

Randomised controlled trial

**Study setting(s)**

Hospital

## **Study type(s)**

Treatment

## **Participant information sheet**

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

## **Health condition(s) or problem(s) studied**

Smoking cessation

## **Interventions**

Randomisation will be conducted by a web-based application system created by the trialists' clinical trials unit. Randomisation will be in blocks of mixed sizes. Allocation is 1:1.

Participants will be randomised (1:1) to receive either nicotine patches for up to 8 weeks (15mg /16hr) or an e-cigarette starter pack. Both groups will receive weekly telephone support for 6 weeks from specialist stop smoking advisors. Participants will be follow up at the end of pregnancy and at 3 months postpartum.

## **Intervention Type**

Mixed

## **Primary outcome measure**

Prolonged abstinence rates at the end of pregnancy, defined as per Russell Standard (up to 5 lapses allowed from 2 weeks after the target quit day until end of pregnancy, with no smoking at all during the previous week at the time of follow-up), and verified by salivary cotinine (< 15 ng /ml) for those not reporting using any nicotine product and anabasine (< 1 ng/ml) for those reporting other forms of nicotine use.

## **Secondary outcome measures**

1. Smoke intake and nicotine intake, measured by salivary anabasine and salivary cotinine levels, assessed for participants still using NRT or EC at end of pregnancy and for 'dual users'
2. 7-day point-prevalence abstinence (not a puff in the last 7 days), self-reported at 4 weeks, end of pregnancy and at 3 months post-partum
3. Prolonged abstinence, self-reported at end of pregnancy and 3 months post-partum
4. Use of NRT and EC throughout pregnancy, measured by asking participants on how many days they used their products at each weekly contact and at follow-ups
5. Safety examined by looking at the proportion of participants reporting adverse events and serious adverse events in each group throughout pregnancy; proportion of participants in each group reporting adverse events and serious adverse events for themselves or their infant at 3 months post-partum; and differences in birth and maternal outcomes between the two groups

## **Overall study start date**

01/05/2017

## **Completion date**

26/11/2020

## **Eligibility**

**Key inclusion criteria**

1. Daily smokers
2. 12 to 24 weeks pregnant
3. Wants help with stopping smoking
4. Willing to be randomised to use either NRT or EC (to avoid selective drop-out and contamination)
5. Willing to receive 6 weekly support calls over the phone plus two follow-up calls
6. Speaks English (to allow data collection via phone)
7. Aged 18 years or over

**Participant type(s)**

Healthy volunteer

**Age group**

Adult

**Lower age limit**

18 Years

**Sex**

Female

**Target number of participants**

1,142

**Total final enrolment**

1140

**Key exclusion criteria**

1. Known allergic reaction to nicotine skin patches (a contraindication for patch use)
2. Current daily use of NRT or EC
3. Taking part in another interventional trial
4. Serious medical problem or high-risk pregnancy (to avoid problems with follow-up and data collection)

**Date of first enrolment**

01/01/2018

**Date of final enrolment**

07/11/2019

**Locations****Countries of recruitment**

England

Scotland

United Kingdom

**Study participating centre**  
**Queen Mary University of London**  
United Kingdom  
E1 4AH

**Study participating centre**  
**Countess of Chester Hospital**  
Chester  
United Kingdom  
CH2 1UL

**Study participating centre**  
**Royal Preston Hospital**  
Preston  
United Kingdom  
PR2 9HT

**Study participating centre**  
**Leighton Hospital**  
Crewe  
United Kingdom  
CW1 4QJ

**Study participating centre**  
**Warrington & Halton Hospital**  
Warrington  
United Kingdom  
WA5 1QG

**Study participating centre**  
**Queen Elizabeth Hospital Gateshead**  
Gateshead  
United Kingdom  
NE9 6SX

**Study participating centre**  
**Royal Victoria Infirmary**  
Newcastle upon Tyne

United Kingdom  
NE1 4LP

**Study participating centre**  
**Sunderland Royal Hospital**  
Sunderland  
United Kingdom  
SR4 7TP

**Study participating centre**  
**Cumberland Infirmary**  
Carlisle  
United Kingdom  
CA2 7HY

**Study participating centre**  
**Bradford Royal Hospital**  
Bradford  
United Kingdom  
BD9 6RJ

**Study participating centre**  
**St Mary's Hospital, Manchester**  
Manchester  
United Kingdom  
M13 9WL

**Study participating centre**  
**Burnley General**  
Burnley  
United Kingdom  
BB10 2PQ

**Study participating centre**  
**North Manchester General/ Royal Oldham**  
Manchester  
United Kingdom  
M8 5RB

**Study participating centre**  
**Birmingham Womens Hospital**  
Birmingham  
United Kingdom  
B15 2TG

**Study participating centre**  
**Royal Stoke Hospital**  
Stoke-on-Trent  
United Kingdom  
ST4 6QG

**Study participating centre**  
**Birmingham City Hospital**  
Birmingham  
United Kingdom  
B18 7QH

**Study participating centre**  
**Princess Royal Hospital, Telford**  
Telford  
United Kingdom  
TF1 6TF

**Study participating centre**  
**Royal Devon & Exeter Hospital**  
Exeter  
United Kingdom  
EX2 5DW

**Study participating centre**  
**Derriford Hospital, Plymouth**  
Plymouth  
United Kingdom  
PL6 8DH

**Study participating centre**

**NHS Forth Valley**

Stirling  
United Kingdom  
FK9 4SW

**Study participating centre****Nottingham University Hospitals**

Nottingham  
United Kingdom  
NG7 2UH

**Study participating centre****Russels Hall, Dudley**

Dudley  
United Kingdom  
DY1 2HQ

**Study participating centre****University Hospitals of Derby & Burton**

Derby  
United Kingdom  
DE22 3NE

**Study participating centre****Heart of England NHS**

Birmingham  
United Kingdom  
B9 5SS

## **Sponsor information**

**Organisation**

Queen Mary University of London

**Sponsor details**

Joint Research Management Office  
QM Innovation Building  
5 Walden Street  
London

England  
United Kingdom  
E1 2EF

**Sponsor type**  
University/education

**ROR**  
<https://ror.org/026zzn846>

## **Funder(s)**

**Funder type**  
Government

**Funder Name**  
Health Technology Assessment Programme

**Alternative Name(s)**  
NIHR Health Technology Assessment Programme, HTA

**Funding Body Type**  
Government organisation

**Funding Body Subtype**  
National government

**Location**  
United Kingdom

## **Results and Publications**

**Publication and dissemination plan**  
The results of the study will be published in a high-impact peer reviewed journal.

**Intention to publish date**  
01/05/2022

**Individual participant data (IPD) sharing plan**  
The datasets generated during and/or analysed during the current study are/will be available upon request from Dr Dunja Przulj.

Added 12/09/2017:  
Once the study is published, if a researcher/academic requests the dataset or part of the dataset (for example if conducting a review/meta-analysis), then they will be provided with the Excel

data file if necessary. Data is archived electronically for 20 years. Any data shared will be completely anonymised, and as consent has not been requested from participants for this.

## IPD sharing plan summary

Available on request

### Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
<a href="#">Results article</a>	A qualitative study of factors influencing adherence	16/05/2022	17/05/2022	Yes	No
<a href="#">HRA research summary</a>			28/06/2023	No	No
<a href="#">Results article</a>		01/07/2023	16/10/2023	Yes	No
<a href="#">Other publications</a>		07/01/2021	17/06/2025	Yes	No