

# Comparing the Cochrane review of electronic cigarettes to other meta-analyses

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# What I'll cover

- About Cochrane
- Summary of key findings from Cochrane review of electronic cigarettes (EC) for smoking cessation
- Comparisons with other meta-analyses of EC for smoking cessation

# Cochrane reviews

## WHAT?

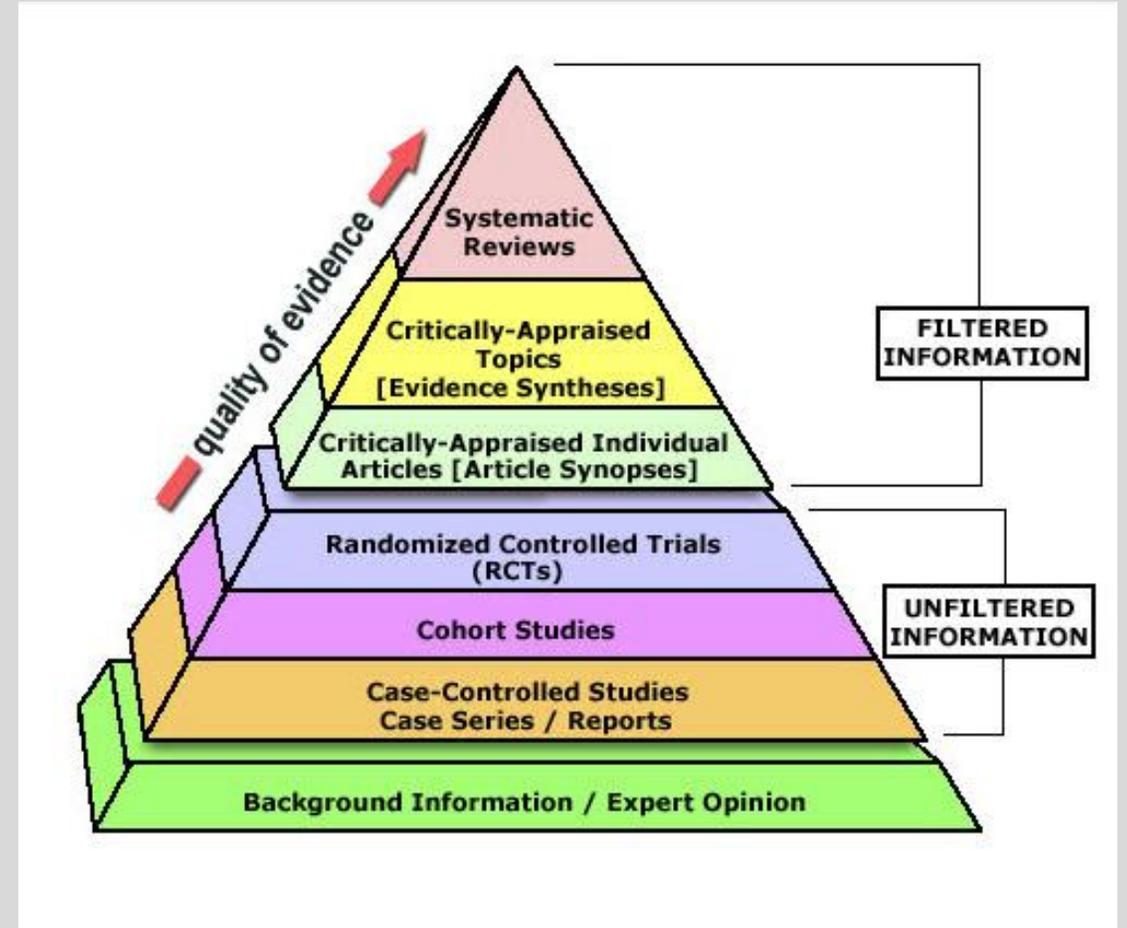
- Gathers and combines the best evidence from research to determine the benefits and risks of treatments/interventions

## HOW?

- By systematically reviewing the available evidence, with strong emphasis on quality assessment

## WHY?

- To help people making healthcare decisions





## Electronic cigarettes for smoking cessation (Review)

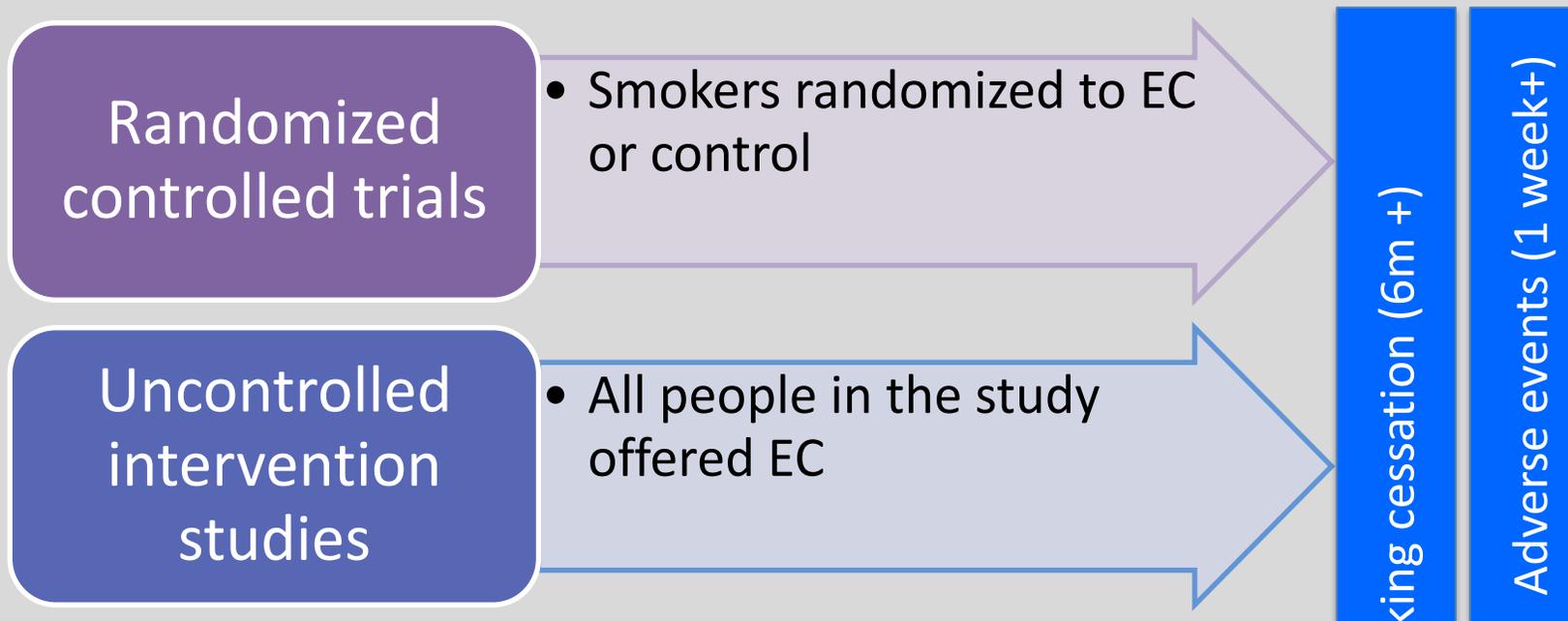
Hartmann-Boyce J, McRobbie H, Bullen C, Begh R, Stead LF, Hajek P

Hartmann-Boyce J, McRobbie H, Bullen C, Begh R, Stead LF, Hajek P.  
Electronic cigarettes for smoking cessation.  
*Cochrane Database of Systematic Reviews* 2016, Issue 9. Art. No.: CD010216.  
DOI: 10.1002/14651858.CD010216.pub3.

[www.cochranelibrary.com](http://www.cochranelibrary.com)

Objective: Evaluate the safety and effect of using EC to help people who smoke achieve long-term smoking abstinence

## Inclusion criteria: study design



Won't be included in next update due to nature of their design and risk of confounding

# Outcomes

## Cessation

- 6 months+
- Intention to treat
- Strictest definition of abstinence
- Biochemically verified where available
- (as per standard Cochrane methods)

## Adverse events (AE)

- One week or longer of EC use
- Defined as any undesirable experience associated with the use of a medical product in a patient

## Serious adverse events (SAE)

- One week or longer of EC use
- Any AE where the patient outcome is death; life-threatening; hospitalization; disability; birth defect; or requires intervention to prevent any of the above

## Changes in relevant biomarkers

- One week or longer of EC use
- Known carcinogens
- Exhaled carbon monoxide
- Airway and lung function
- Blood oxygen levels

# Numerical analyses

- Pooled data where appropriate following standard Cochrane methods

$$\text{Risk ratio} = \frac{\text{\# of people quit in intervention group} / \text{\# of people in intervention group}}{\text{\# of people quit in control group} / \text{\# of people in control group}}$$

Risk ratio = 1 if no difference  
< 1 if more people quit in control  
> 1 if more people quit in intervention

# Included studies: RCTs

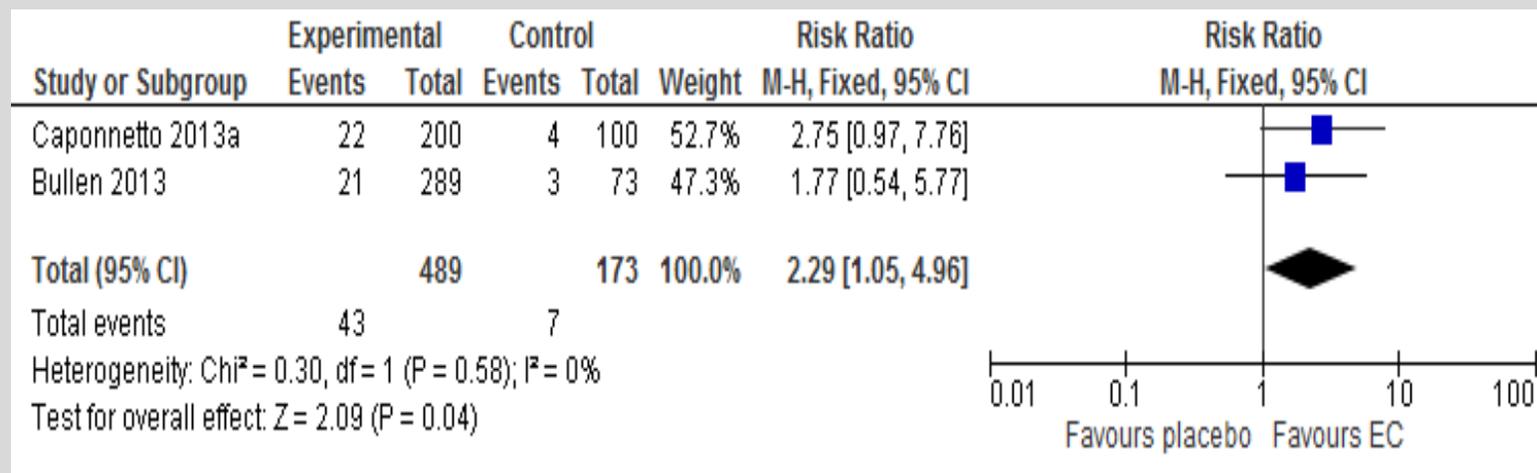
## Caponetto 2013

- 300 smokers not intending to quit
- EC with and without nicotine
- 12 month follow-up

## Bullen 2013

- 657 smokers wanting to quit
- EC with nicotine, EC without nicotine, NRT (patches)
- 6 month follow-up

# Quitting at 6 months and longer, EC versus placebo



GRADE quality of evidence: LOW (small number of studies, poor nicotine delivery)

# Adverse events

- There were no serious adverse events related to EC use in any study
- Non-serious adverse effects did not differ between study arms
- Cohort studies similar, mouth and throat irritation most frequent AE, dissipating over time
- Longest use: 2 years

GRADE quality of evidence: LOW (small number of studies, cohort studies at high risk of bias)

# Comparison with other reviews

- Since our review was first published in 2014, 20 other systematic reviews have been published looking at safety/efficacy of EC for quitting smoking
- All agree more evidence is needed (particularly in terms of long-term effects)
- 5 conduct meta-analyses; in the next slides we talk through each of these in more detail

# Rahman 2015



RESEARCH ARTICLE

## E-Cigarettes and Smoking Cessation: Evidence from a Systematic Review and Meta-Analysis

Muhammad Aziz Rahman<sup>1,2,3\*</sup>, Nicholas Hann<sup>3,4</sup>, Andrew Wilson<sup>3,4,5</sup>,  
George Mnatzaganian<sup>6</sup>, Linda Worrall-Carter<sup>2,3,5</sup>

1 The Mary MacKillop Institute for Health Research, Australian Catholic University, Melbourne, Australia, 2 St Vincent's Centre for Nursing Research (SVCNR), Australian Catholic University, Melbourne, Australia, 3 The Cardiovascular Research Centre (CvRC), Australian Catholic University, Melbourne, Australia, 4 The University of Melbourne, Melbourne, Australia, 5 St Vincent's Hospital, Melbourne, Australia, 6 School of Allied Health, Faculty of Health Sciences, Australian Catholic University, Melbourne, Australia

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Abstract

# How do they compare?

Characteristics	Rahman 2015	Cochrane review	Notes
Studies included in meta-analysis	2 RCTs	2 RCTs	Same two studies
Follow-up	Results at longest follow-up	Same	Exact same
Losses	Loss to follow-up treated as continuing smokers	Same	Exact same
Effect estimate: cessation	RR 2.29, 95% CI 1.05 to 4.96	RR 2.29, 95% CI 1.05 to 4.96	Exact same

# El Dib 2016, Khoudigan 2016, Vanderkam 2016

Downloaded from <http://bmjopen.bmj.com/> on October 26, 2017 - Published by group.bmj.com

Open Access

Research

## BMJ Open Electronic nicotine delivery systems and/or electronic non-nicotine delivery systems for tobacco smoking cessation or reduction: a systematic review and meta-analysis

Regina El Dib,<sup>1,2,3</sup> Erica A Suzumura,<sup>4</sup> Elie A Akl,<sup>5,6</sup> Huda Goma,<sup>7</sup> Amav Agarwal,<sup>6,8</sup> Yaping Chang,<sup>6</sup> Manya Prasad,<sup>9</sup> Vahid Ashoori,<sup>6,10</sup> Diane Heels-Ansell,<sup>6</sup> Wasim Mazia,<sup>11</sup> Gordon Guyatt<sup>6,12</sup>

Int J Public Health (2016) 61:257–267  
DOI 10.1007/s00038-016-0786-z

REVIEW



## The efficacy and short-term effects of electronic cigarettes as a method for smoking cessation: a systematic review and a meta-analysis

S. Khoudigian · T. Devji · L. Lytvyn · K. Campbell · R. Hopkins · D. O'Reilly

Presse Med. 2016; 45: 971-985  
en ligne sur [www.tandfonline.com/revue/psm](http://www.tandfonline.com/revue/psm)  
[www.sciencedirect.com](http://www.sciencedirect.com)

PNEUMOLOGIE / ADDICTOLOGIE



## Efficacité et sécurité de la cigarette électronique pour la réduction du tabagisme : revue systématique et méta-analyse

Revue de la littérature

Paul Vanderkam<sup>1</sup>, Rémy Boussageon<sup>2</sup>, Michel Underner<sup>3</sup>, Nicolas Langbourg<sup>4</sup>, Yann Brabant<sup>5</sup>, Philippe Binder<sup>5</sup>, Bernard Freche<sup>5</sup>, Nematollah Jaafari<sup>6</sup>

# How do they compare?

Characteristics	El Dib 2016	Khoudigan 2016	Vanderkam 2016	Cochrane review	Notes
Studies included in meta-analysis	2 RCTs	2 RCTs	2 RCTs	2 RCTs	Same two studies
Follow up	Results at six months	Results at six months	Results at six months	Results at longest follow-up	<b>6m data as opposed to 12m data (Caponetto)</b>
Losses	Losses treated as continuing smokers	Same	Same	Same	Same
Effect estimate: cessation	RR 2.03, 95% CI 0.94 to 4.38	RR 2.02, 95% CI 0.97 to 4.22	RR 1.93, 95% CI 0.92 to 4.01	RR 2.29, 95% CI 1.05 to 4.96	Not stat. sig for non-Cochrane due to 6m data

# Kalkohran 2016

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 **Articles**

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## E-cigarettes and smoking cessation in real-world and clinical settings: a systematic review and meta-analysis

Sara Kalkhoran, MD, Prof Stanton A Glantz, PhD  

Published: 14 January 2016

 PlumX Metrics 

DOI: [http://dx.doi.org/10.1016/S2213-2600\(15\)00521-4](http://dx.doi.org/10.1016/S2213-2600(15)00521-4) |  CrossMark



# How do they compare?

Characteristics	Kalkhoran 2016	Cochrane review	Notes
Studies included in meta-analysis	20 (15 cohort, 3 cross-sectional, 2 CTs)	2 RCTs	<b>Range of study types included is key difference</b>
Follow up	Whatever was reported in original paper	Results at longest follow-up	No minimum follow-up length
Losses	Whatever method was used in original paper	Loss to follow-up treated as continuing smokers	Studies did not necessarily impute data for losses
Effect estimate: cessation	OR 0.72, 95% CI 0.57 to 0.91	RR 2.29, 95% CI 1.05 to 4.96	Contradictory findings

# Why do the RCTs provide different answers than the observational studies?

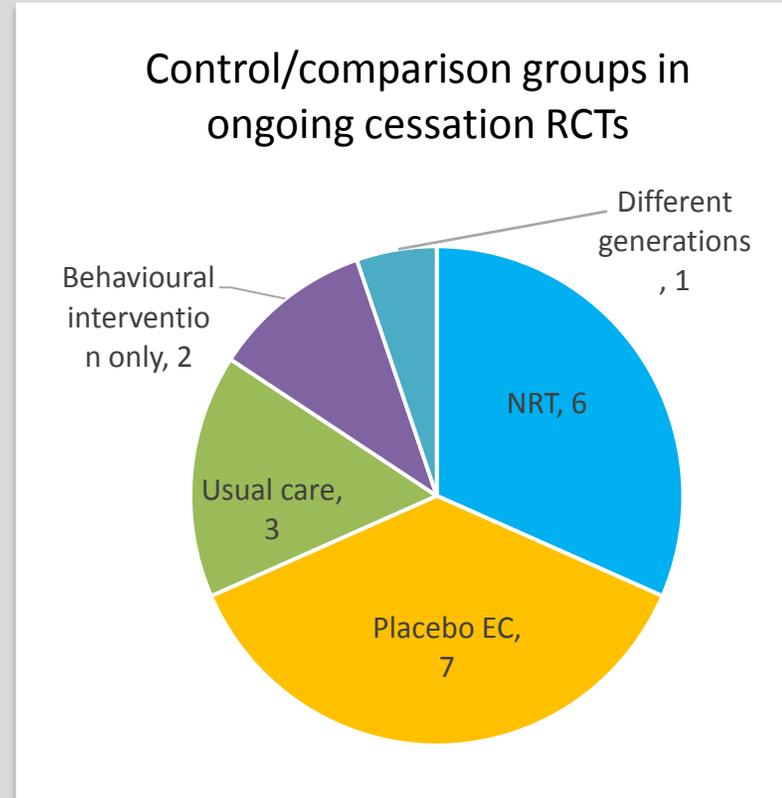
Many different reasons, including:

- variations in the effectiveness of ECs depending on the level of support provided
- issues around definitions of baseline EC usage
- unexplored confounders (not specific to EC – same has been found for NRT when we don't control for confounders)
- studies which analyze results in smokers based on EC use at baseline have by the nature of their design already excluded people who have successfully quit using EC, and therefore only retain participants who, at entrance to the study, would be classed as 'treatment failures' or are in the midst of a cessation attempt involving cutting down to quit.

>>Following the standard methods of the Cochrane Tobacco Addiction Group and the protocol for this review, we focused on evidence from RCTs for cessation outcomes

# Ongoing studies

Of the 27 ongoing studies, 14 may contribute to future cessation meta-analyses (RCTs, measure cessation, 6m+ FU)



**Thank you**

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