E-cigarettes, nicotine replacement and women

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Outline
- Gender differences
- Nicotine replacement therapy
- Electronic cigarettes
- Recommendations for practice

Men and women are different

- Smoking and quit rates
  - Women have lower smoking rates (18-yr)¹
    - Female 14%
    - Males 19%
  - Women have lower quit rates with ²
    - No assistance
    - Behavioural counselling
    - NRT

Women have greater health risks

2. Perkins KA. Smoking cessation in women. CNS 2001

1. Lung cancer: RR 1.25 (vs men)
2. Breast cancer: RR 1.3 (premenopausal)
3. Osteoporosis
4. Pregnancy
5. CVD
6. Gynaecological
7. Foetus, child, adult
8. Infertility

¹ 30.1.2001
² AIHW. National Drug Strategy Household Survey. 2013
Reasons for smoking: men smoke for nicotine

- Men more reinforced by nicotine
- Much greater up-regulation of receptors

Reasons for smoking: women smoke for other reasons

- Relaxation and mood regulation
- Weight control
- Social interaction
- Smoking triggers

Women have faster nicotine metabolism

- Women metabolise nicotine faster (oestrogen induces CYP2A6)
- Women have lower nicotine levels (from NRT and smoking)
- Faster nicotine metabolisers have poorer response to NRT

Effects of menstrual cycle

- No NRT
- Flow phase
- Follicular phase
- Luteal phase

Nicotine withdrawal and cravings

1. Allan A. Addict Behav 2014

Recommendations | Counselling women

- More intensive counselling
- Smoking triggers eg social situations, coffee, telephone calls
- Manage mood and stress
- Discuss weight concerns
- Quit in follicular phase with NRT or luteal phase if no NRT
- Exercise: improves mood and mental wellbeing, reduces weight gain, reduces cravings, health benefits

1. Linke SE. Exercise-based smoking cessation interventions among women. Women’s Health 2011
**NRT less effective in women**

Meta-analysis of 14 studies at 6 months (nicotine patch)

Half as effective in women

Increase in quitting vs placebo 4.6% vs 9.3%

Meta-analysis of 21 studies up to 12 months (all NRT)

Less effective in women at all time points (3-12m)

No significant effect at 12 months

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**Combination NRT**

- Larger response in women

- Significantly more effective than monotherapy

- Equal efficacy to varenicline

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**Patch less effective in overweight women**

2 trials of nicotine patch

- Overweight women BMI>25

  - Higher relapse rates

  - Significantly lower abstinence up to 1 year

  - No difference in men

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**Nicotine in pregnancy**

- Impaired growth (placental vasoconstriction)

  - Increased morbidity and mortality

  - Rapid catch-up growth leads to obesity, CHD, diabetes, hypertension

  - Neurotoxicity: psychiatric, behavioural disorders, cognitive impairment

  - Impaired lung function, asthma

  - Nicotine dependence twice as likely

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**NRT in pregnancy: effectiveness**

- RCTs have not demonstrated efficacy for NRT in pregnancy

- Blood nicotine levels lower due to

  - Clearance of nicotine increased by 60%

  - Poor adherence

- Large observational study n=3,880

  Combination therapy effective OR 1.93 (monotherapy NS)

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**NRT in pregnancy: safety**

- Insufficient evidence to determine if NRT is safe

  - However, expert opinion and available data and suggest it is *less harmful than continuing to smoke*

    - No increased risk of preterm birth, perinatal mortality, fetal death, neonatal intensive care unit visits, miscarriage or spontaneous abortion

    - No reduction in birth weight

    - Reduced incidence of impaired infant development at 2y

    - Risk in lactation is minimal

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3. Half as effective in women
4. Increase in quitting vs placebo 4.6% vs 9.3%
5. Meta-analysis of 21 studies up to 12 months (all NRT)
6. Meta-analysis of 14 studies at 6 months (nicotine patch)
7. Ca$hman K. Cochrane review 2013
15. Coleman T. NEJM 2012
16. Brose L. Drug Alcohol Depend 2013
17. Zwar N. Pharmacist 2006
18. Lassen T. Paed Perinatal Epidem 2012
20. Dempsey D. J Pharm Exp Ther 2002

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**E-cigarettes, nicotine replacement and women**

**Recommendations**

**Optimise NRT in women**

- Larger doses, esp. if premenopausal, OCP, pregnant, obese
- Combination therapy
- Safety, effectiveness, addictiveness myths
- Pre-cessation nicotine patch
- Correct use of oral NRT
- At least 8 weeks
- Consider varenicline or bupropion
- More effective than patch in fast metabolisers

**References**

4. Ferguson S. Addiction 2012
5. Stead L. Cochrane Review 2012
6. Ferguson S. Addiction 2014

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**NRT in pregnancy**

- Approved in pregnancy
- Try counselling first (briefly)
- Explain risks and benefits to patient
- Start with oral NRT
- Nicotine patches, removed at bedtime
- Combination therapy and larger doses may be required

**Recommendations**

**NRT in pregnancy**

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- Try counselling first (briefly)
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- Start with oral NRT
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**References**

1. Mendelsohn C. Aust Fam Physician 2014
2. Zwar N. Supporting smoking cessation. RACGP 2014

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**Electronic cigarettes**

**Battery**

- Propane glycol, glycerol
- Eye and respiratory irritation
- Toxic compounds and carcinogens

**Contamination**

- Chemical degradation
- Carbonyls, nitrosamines, metals, VOCs
- No tar, CO, smoke
- The vast majority of the 7,000 chemicals in tobacco smoke are completely absent

**The vapour**

<table>
<thead>
<tr>
<th>Nicotine</th>
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<tr>
<td>• Minor health effects</td>
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<tr>
<td>• Generally lower dose than cigarettes but can be higher</td>
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**Flavourings**

- Propylene glycol, glycerol
- Eye and respiratory irritation

**The device**

- Very large batteries
- Customisable, adjustable power output
- Higher nicotine delivery

**The devices**

- First generation: ‘Cigarette-like’
  - Disposable, single use
  - Non-rechargeable, replaceable cartridges

- Second generation: ‘Tank style’
  - Larger, refillable chamber (‘tank’)
  - Higher capacity battery
  - Higher nicotine delivery

- Third generation: ‘Mods’
  - Customisable, adjustable power output
  - Higher nicotine delivery

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**Nicotine delivery device**

**Simulation of smoking**

1. Nicotine
2. Behavioural
3. Sensory

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**References**

1. Godwicz M. Tab Control 2014
**Safety**

- No evidence of health risk with short-term use (<2y) \(^1\)
- Long-term health effects are unknown but highly likely to be < smoking \(^2\)
- No data on use in pregnancy \(^3\)

\(^1\) McRobbie H. Electronic cigarettes for smoking cessation and reduction. Cochrane Review 2014
\(^2\) Hajek P. Addiction 2014
\(^3\) Suter M. Birth Defects 2014

**Effectiveness**

- Effective in relieving cravings and withdrawal symptoms
- Some evidence of effectiveness for smoking cessation
- Newer technologies with improved nicotine delivery may be more effective
- More research is needed before firm conclusions can be made

**Are they legal in NSW?**

| E-cigs: no nicotine | ✔
|---------------------|---
| Nicotine & e-cigs with nicotine | ✗
| Nicotine obtained by script | ✔
| Personal Importation Scheme (TGA) | ✔
| Compounding pharmacy | ✔

1. Public Health (Tobacco) Act 2008
2. Poisons and Therapeutic Goods Act 1966
3. Poisons and Therapeutic Goods Regulation 2008
4. TGA. Personal Importation Scheme

**Case studies**

- **58yo public servant**
  - Currently quitting with nicotine patches.
  - "I enjoy the feeling of smoke hitting the back of my throat and watching the cloud of smoke."  
  - Nicotine-free e-cig: "It feels like I am having a cigarette."

- **39yo importer**
  - Quit 8 weeks ago, still taking Champix.
  - "Cigarettes are a companion, comfort, a friend, hard to let go. "It releases me."
  - Nicotine-free e-cig: "I mainly use it with smoking friends so I can join in the gossip."

- **29yo model**
  - Quit 6m ago with nicotine patches and oral strips.
  - "I smoke when I am hungry instead of eating."
  - Nicotine-free e-cig: "I use it when I get cravings to eat and when I get the urge to smoke, for example after dinner."

**Recommendations**

- Recommend approved, regulated products first \(^1,2,3\)
- Consider e-cigs if this fails, is not tolerated or refused and patient interested in e-cigs \(^1,2,3\)
- Useful adjunct to approved products and counselling
- Special benefits for women
  - Behavioural aspect of smoking (unlike NRT)
  - Coping strategy for cue-induced cravings
  - Social situations

\(^1\) AASCP Information Sheet 2014
\(^2\) Grana R. Circulation 2014
\(^3\) Hajek P. Addiction 2014
\(^4\) Barbeau A. Addict Sci Clin Practice 2013