

Avondale University

ResearchOnline@Avondale

Open Educational Materials

Open Educational Resources

10-2021

Managing Vaping Cessation: A Monograph for Counselling Adult and Adolescent Vapers

Renee Bittoun

Avondale University, renee.bittoun@avondale.edu.au

Follow this and additional works at: https://research.avondale.edu.au/oer_materials



Part of the [Medicine and Health Sciences Commons](#)

Recommended Citation

Bittoun, R. (2021). Managing vaping cessation: A monograph for counselling adult and adolescent vapers. *ResearchOnline@Avondale*. https://research.avondale.edu.au/oer_materials/1/

This Article is brought to you for free and open access by the Open Educational Resources at ResearchOnline@Avondale. It has been accepted for inclusion in Open Educational Materials by an authorized administrator of ResearchOnline@Avondale. For more information, please contact alicia.starr@avondale.edu.au.

Managing Vaping Cessation: A Monograph for Counselling Adult and Adolescent Vapers

Renee Bittoun

Professor, Nicotine Addiction Unit
Lifestyle Medicine & Health Research Centre
Avondale University



PROFESSOR RENEE BITTOUN: NICOTINE ADDICTION UNIT – LIFESTYLE MEDICINE AND HEALTH RESEARCH CENTRE

© 2021. This work is licensed under a [CC BY-NC-ND 4.0 license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

WANT TO LEARN MORE? CALL +61 2 49802377 TO ENQUIRE ABOUT AVONDALE UNIVERSITY'S POST-GRADUATE "NICOTINE ADDICTION & SMOKING CESSATION" MICRO-CREDENTIAL

Introduction

With recent regulations in Australia requiring a prescription to access nicotine-containing electronic cigarettes or vapes (for brevity, this paper uses the term vaping), some users are attempting to abstain altogether due to reduced accessibility and/or increasing costs and information regarding the potential long-term health consequences. There are particular concerns regarding adolescent vapers who have previously acquired vapes illegally and may now manifest symptoms of withdrawals as they are unable to access vapes through their usual “sources”.

This paper contains some strategies and resources to help smoking cessation counsellors assess and assist vapers who are attempting to cease nicotine vaping altogether.

Background

Plasma nicotine levels have been shown to be high in vapers, and, as in smokers, vapers are known to achieve their satisfying individual levels of nicotine by compensatory vaping, irrespective of the nicotine content in the vape (Hajek et al., 2017). This titration is achieved by changing the topography of vaping by taking more puffs, inhaling deeper and breath-holding (Dawkins et al., 2016). Effects such as personal rates of metabolising nicotine also drive the topography of vaping (Hiler et al., 2017). There is also some evidence that “experienced” vapers achieve faster and higher levels of plasma nicotine than they had when smoking traditional cigarettes due to the ever-increasing sophistication of the “nicotine delivery devices” (Hajek et al., 2017). Nicotine withdrawals from vaping have been described both in adults as well as adolescent vapers (Kong et al., 2021; Simpson et al., 2021). There is

PROFESSOR RENEE BITTOUN: NICOTINE ADDICTION UNIT – LIFESTYLE MEDICINE AND HEALTH RESEARCH CENTRE

© 2021. This work is licensed under a [CC BY-NC-ND 4.0 license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

WANT TO LEARN MORE? CALL +61 2 49802377 TO ENQUIRE ABOUT AVONDALE UNIVERSITY'S POST-GRADUATE “NICOTINE ADDICTION & SMOKING CESSATION” MICRO-CREDENTIAL

a risk that withdrawals when attempting to quit vaping may lead to relapse to tobacco smoking in past smokers or result in progress to tobacco smoking in adolescents (Everard et al., 2020; Martinelli et al., 2021).

There is preliminary evidence that, as with smoking, vaping may produce toxic effects that induce the generation of polycyclic aromatic hydrocarbons (PAHs) and other harmful substances (Canistro et al., 2017). Even though there is no combustion, very small amounts of PAHs occur during the production of e-cigarettes and vapes (Beauval et al., 2017). As we know, PAHs induce liver enzymes, in particular P450 CYP 1A2, and affect requirements for prescribed medications (van der Plas et al., 2020); therefore, vapers may also require monitoring concerning medications and other substances they are using. Further concerns regarding the effects of passive vaping on vapers attempting to cease vaping have striking similarities with passive smoking (Su et al., 2021).

Why do adolescents vape?

Adolescents initially start vaping “for fun,” encouraged by online influencers and peers. They describe experiencing a “head-spin” or a “buzz” and say that they “like doing it”, it is “like a pacifier”, “calms you down”, and is effectually a source of “stress release” and weight control (Kong et al., 2021; Simpson et al., 2021). Unfortunately, a deleterious effect is the rapid development of nicotine dependence. We have also seen that young smokers are faithful to preferred flavours, and some are vaping daily, at home alone, as soon as they wake up. Many are unaware that they vape high nicotine content vaping “pods” (Bittoun, TATU, NCIE unpublished data).

PROFESSOR RENEE BITTOUN: NICOTINE ADDICTION UNIT – LIFESTYLE MEDICINE AND HEALTH RESEARCH CENTRE

© 2021. This work is licensed under a [CC BY-NC-ND 4.0 license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

WANT TO LEARN MORE? CALL +61 2 49802377 TO ENQUIRE ABOUT AVONDALE UNIVERSITY'S POST-GRADUATE “NICOTINE ADDICTION & SMOKING CESSATION” MICRO-CREDENTIAL

Is Vaping Cessation the same as Smoking Cessation?

There is a paucity of guidelines to help counsellors address vaping cessation, and there are currently at least four types of vapers:

1. Adults who vape daily.
2. Adults who are dual vaping and tobacco smoking daily.
3. Adolescents who vape non-daily.
4. Adolescents who vape daily.

It is currently not known whether adolescents engage in dual vaping and smoking.

There are suggestions that there are similarities between smoking cessation and vaping cessation; yet, there are some differences (Sanchez et al., 2021). However, there are currently no protocols for:

- Assessing adult vaping dependence
- Managing vaping withdrawals
- Managing vaping cessation
- Assessing adolescent vaping dependence
- Managing adolescent vaping withdrawals
- Managing adolescent vaping cessation

Assessing a vaper for dependence

Ideally, assessing a vaper should include:

PROFESSOR RENEE BITTOUN: NICOTINE ADDICTION UNIT – LIFESTYLE MEDICINE AND HEALTH RESEARCH CENTRE

© 2021. This work is licensed under a [CC BY-NC-ND 4.0 license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

WANT TO LEARN MORE? CALL +61 2 49802377 TO ENQUIRE ABOUT AVONDALE UNIVERSITY'S POST-GRADUATE "NICOTINE ADDICTION & SMOKING CESSATION" MICRO-CREDENTIAL

- Time to First Vape
- Puffs/day
- What they vape
- Where they vape
- Symptoms associated with withdrawals when attempting to abstain
- Biological test

Questionnaires

There have been some e-cigarette or vaping dependence questionnaires developed for adults. Fould's Penn State [Electronic] Cigarette Dependence Index (Foulds et al., 2015) may be a useful tool (Appendix 1). However, as yet, there are no adolescent vaping dependence questionnaires. It seems intuitive that time to first cigarette (TTFC) be converted to time to first vape (TTFV). This author has adapted the Hooked on Nicotine Checklist (HONC) adolescent smoking dependence questionnaire (DiFranza et al., 2007) to be an adolescent vaping questionnaire, see Appendix 2.

Puff frequency

Vapers may puff between 50 to 1000 times per day (Etter & Bullen, 2011); yet, there is limited evidence that the frequency of puffing may help determine dependence, as titration occurs, as discussed earlier. However, withdrawals between puffs may be assessed, and frequency may be a factor related to the strength of nicotine content in the vapes (Dawkins et al., 2016).

Biological tests

Cotinine

Independent non-invasive biological validation of self-reported use of vapes is possible using urine or salivary cotinine, the metabolite of nicotine, which has a longer half-life than nicotine and can indicate cotinine levels as long as 36 hours after vaping and smoking (Etter et al., 2000; Etter & Bullen, 2011). This author has used these measurements to “titrate” nicotine replacement therapies to individual cotinine levels (Hurt et al., 1993). Cotinine assays have been expensive in the past and require samples to be sent to a laboratory. Cheaper cotinine urine dip-stick tests can now be used to measure cotinine levels immediately and can give feedback to vapers concerning the amount of nicotine they are deriving from the vapes. This is particularly important for vapers, including adolescents who may not be aware that there is nicotine in the products they are using. The current development of oral salivary swabs, giving instant visual salivary cotinine levels, will be a promising advancement. A vaper can easily self-swab and show to a counsellor once the vaper has swabbed their own mouth, with the potential to do this through telemedicine.

Expired carbon monoxide

Validating baseline self-reported concomitant smoking can continue to be measured using expired carbon monoxide (Bittoun, 2008) when required.

Vaping withdrawals

Withdrawals from nicotine in adults have been well studied. We are also aware that adolescents have significant nicotine withdrawals, despite not having a long history of smoking or vaping (DiFranza et al., 2007).

Signs of withdrawals between puffs

- Irritable
- Angry
- Headaches
- Poor concentration at work or in class

Signs of addiction

- Wake up and vape within ½ hour
- Hide vapes close by-in bed/in pocket
- Strong cravings and urges to use
- Increase quantity and frequency
- Inability to restrain or quit

Pharmacotherapies for vaping cessation

It is well known that pharmacotherapies greatly assist in smoking cessation if correct doses and adequate adjustments are made in follow-up. Over many decades we have learnt that individualised “bespoke” treatment greatly reduces nicotine withdrawals in adults and

PROFESSOR RENEE BITTOUN: NICOTINE ADDICTION UNIT – LIFESTYLE MEDICINE AND HEALTH RESEARCH CENTRE

© 2021. This work is licensed under a [CC BY-NC-ND 4.0 license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

WANT TO LEARN MORE? CALL +61 2 49802377 TO ENQUIRE ABOUT AVONDALE UNIVERSITY'S POST-GRADUATE “NICOTINE ADDICTION & SMOKING CESSATION” MICRO-CREDENTIAL

enhances cessation outcomes (Fagerström, 2005). This is likely to be the same with vaping cessation.

Nicotine replacement therapies (NRT) for vaping cessation

Nicotine replacement therapies have been widely used for smoking cessation, and adaptation for vaped nicotine withdrawals seems logical. The main concern with NRTs is nicotine under-dosing such that many products do not “replace” the required nicotine (Hurt et al., 1993). This under-dosing is reflected in algorithms with the addition of more nicotine replacement products as required (Przulj et al., 2019). Accompanying this article are three flow charts or algorithms for three types of vapers. Appendix 3 is a flow chart or algorithm for combination nicotine replacement therapy for adult vapers who only vape. Appendix 4 is a flow chart for combination nicotine replacement therapies for adult dual vapers and smokers. Appendix 5 is a flow chart for nicotine replacement therapy for adolescent vapers. These NRTs are safe for adolescents over the age of 12 (Cavallo & Krishnan-Sarin, 2019). If available, carbon monoxide tests are incorporated within these flow charts to confirm the non-smoking status of all substances.

Other standard smoking cessation treatments for adults

Evidence-based pharmacotherapies such as varenicline and bupropion and in combinations may be equally helpful. There may be a future role for cytisine in both smoking and vaping cessation.

Behavioural interventions

There are few specific behavioural change guidelines for vapers. It seems intuitive that they would be similar to smoking cessation behavioural guidelines. This may not be entirely the same for adolescents (Sanchez et al., 2021). Attached, in Appendix 6, are some evidence-based suggestions with citations that have been translated from smoking cessation to vaping cessation by this author.

Conclusion

Nicotine is an addictive substance and is not benign. There is an urgent need to develop guidelines for health workers to address nicotine addiction in all vapers, educate vapers, assess their usage and help them manage withdrawals. The materials and resources in this article will be updated as more evidence-based, accessible information comes to hand.

Acknowledgments

Research assistance: Melanie Renfrew, PhD candidate, Lifestyle Medicine & Health Research Centre, Avondale University.

Reviewers: Dr Karen Counter, GP, Tobacco Treatment Specialist and Dr Maya Saba, Faculty of Pharmacy, University of Sydney.

Conflicts of interest

The author has no affiliation with a tobacco company, a pharmaceutical company or any other related business. No hospitality, travel expense or any other benefit is received from such companies. As such, there are no conflicts of interest to declare.

PROFESSOR RENEE BITTOUN: NICOTINE ADDICTION UNIT – LIFESTYLE MEDICINE AND HEALTH RESEARCH CENTRE

© 2021. This work is licensed under a [CC BY-NC-ND 4.0 license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

WANT TO LEARN MORE? CALL +61 2 49802377 TO ENQUIRE ABOUT AVONDALE UNIVERSITY'S POST-GRADUATE "NICOTINE ADDICTION & SMOKING CESSATION" MICRO-CREDENTIAL

List of appendices available for download

Appendix 1: Vaping Questionnaire for Adults (includes Fould's Penn State [Electronic] Cigarette Dependence Index)

Appendix 2: Hooked on Nicotine Checklist (HONC) – adapted for vaping by R. Bittoun

Appendix 3: Bittoun Combination Nicotine Replacement Therapy Algorithm for Adult Vapers (for those who are not smoking as well)

Appendix 4: Bittoun Combination Nicotine Replacement Therapy Algorithm for Adults Dual Smoking and Vaping

Appendix 5: Bittoun Combination Nicotine Replacement Therapy Algorithm for Adolescents who Vape

Appendix 6: Behavioural Strategies for Vapers (compiled by R. Bittoun)

PROFESSOR RENEE BITTOUN: NICOTINE ADDICTION UNIT – LIFESTYLE MEDICINE AND HEALTH RESEARCH CENTRE

© 2021. This work is licensed under a [CC BY-NC-ND 4.0 license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

WANT TO LEARN MORE? CALL +61 2 49802377 TO ENQUIRE ABOUT AVONDALE UNIVERSITY'S POST-GRADUATE "NICOTINE ADDICTION & SMOKING CESSATION" MICRO-CREDENTIAL

References

- Beauval, N., Antherieu, S., Soyez, M., Gengler, N., Grova, N., Howsam, M., Hardy, E. M., Fischer, M., Appenzeller, B. M. R., Goossens, J.-F., Allorge, D., Garçon, G., Lo-Guidice, J.-M., & Garat, A. (2017). Chemical evaluation of electronic cigarettes: Multicomponent analysis of liquid refills and their corresponding aerosols. *Journal of Analytical Toxicology*, 41(8), 670-678. <https://doi.org/10.1093/jat/bkx054>
- Bittoun, R. (2008). Carbon monoxide meter: The essential clinical tool — the ‘Stethoscope’ — of smoking cessation. *Journal of Smoking Cessation*, 3(2), 69-70. <https://doi.org/10.1375/jsc.3.2.69>
- Canistro, D., Vivarelli, F., Cirillo, S., Babot Marquillas, C., Buschini, A., Lazzaretti, M., Marchi, L., Cardenia, V., Rodriguez-Estrada, M. T., Lodovici, M., Cipriani, C., Lorenzini, A., Croco, E., Marchionni, S., Franchi, P., Lucarini, M., Longo, V., Della Croce, C. M., Vornoli, A., Colacci, A., Vaccari, M., Sapone, A., & Paolini, M. (2017). E-cigarettes induce toxicological effects that can raise the cancer risk. *Scientific Reports*, 7(1), 2028-2028. <https://doi.org/10.1038/s41598-017-02317-8>
- Cavallo, D. A., & Krishnan-Sarin, S. (2019). Nicotine use disorders in adolescents. *Pediatric Clinics*, 66(6), 1053-1062. <https://doi.org/10.1016/j.pcl.2019.08.002>
- Dawkins, L. E., Kimber, C. F., Doig, M., Feyerabend, C., & Corcoran, O. (2016). Self-titration by experienced e-cigarette users: Blood nicotine delivery and subjective effects. *Psychopharmacology*, 233(15), 2933-2941. <https://doi.org/10.1007/s00213-016-4338-2>

PROFESSOR RENEE BITTOUN: NICOTINE ADDICTION UNIT – LIFESTYLE MEDICINE AND HEALTH RESEARCH CENTRE

© 2021. This work is licensed under a [CC BY-NC-ND 4.0 license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

WANT TO LEARN MORE? CALL +61 2 49802377 TO ENQUIRE ABOUT AVONDALE UNIVERSITY'S POST-GRADUATE "NICOTINE ADDICTION & SMOKING CESSATION" MICRO-CREDENTIAL

DiFranza, J. R., Savageau, J. A., Fletcher, K., O'Loughlin, J., Pbert, L., Ockene, J. K., McNeill, A.

D., Hazelton, J., Friedman, K., Dussault, G., Wood, C., & Wellman, R. J. (2007).

Symptoms of tobacco dependence after brief intermittent use: The development and assessment of nicotine dependence in Youth-2 Study. *Archives of Pediatrics & Adolescent Medicine*, 161(7), 704-710. <https://doi.org/10.1001/archpedi.161.7.704>

Etter, J.-F., Due, T. V., & Perneger, T. V. (2000). Saliva cotinine levels in smokers and nonsmokers. *American Journal of Epidemiology*, 151(3), 251-258.

<https://doi.org/10.1093/oxfordjournals.aje.a010200>

Etter, J. F., & Bullen, C. (2011). Saliva cotinine levels in users of electronic cigarettes. *European Respiratory Journal*, 38(5), 1219.

<https://doi.org/10.1183/09031936.00066011>

Everard, C. D., Silveira, M. L., Kimmel, H. L., Marshall, D., Blanco, C., & Compton, W. M.

(2020). Association of electronic nicotine delivery system use with cigarette smoking relapse among former smokers in the United States. *JAMA Network Open*, 3(6), e204813-e204813. <https://doi.org/10.1001/jamanetworkopen.2020.4813>

Fagerström, K. O. (2005). Can reduced smoking be a way for smokers not interested in quitting to actually quit? *Respiration*, 72(2), 216-220.

<https://doi.org/10.1159/000084057>

Foulds, J., Veldheer, S., Yingst, J., Hrabovsky, S., Wilson, S. J., Nichols, T. T., & Eissenberg, T.

(2015). Development of a questionnaire for assessing dependence on electronic

PROFESSOR RENEE BITTOUN: NICOTINE ADDICTION UNIT – LIFESTYLE MEDICINE AND HEALTH RESEARCH CENTRE

© 2021. This work is licensed under a [CC BY-NC-ND 4.0 license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

WANT TO LEARN MORE? CALL +61 2 49802377 TO ENQUIRE ABOUT AVONDALE UNIVERSITY'S POST-GRADUATE "NICOTINE ADDICTION & SMOKING CESSATION" MICRO-CREDENTIAL

- cigarettes among a large sample of ex-smoking E-cigarette users. *Nicotine & Tobacco Research*, 17(2), 186-192. <https://doi.org/10.1093/ntr/ntu204>
- Hajek, P., Przulj, D., Phillips, A., Anderson, R., & McRobbie, H. (2017). Nicotine delivery to users from cigarettes and from different types of e-cigarettes. *Psychopharmacology*, 234(5), 773-779. <https://doi.org/10.1007/s00213-016-4512-6>
- Hiler, M., Breland, A., Spindle, T., Maloney, S., Lipato, T., Karaoghlanian, N., Shihadeh, A., Lopez, A., Ramôa, C., & Eissenberg, T. (2017). Electronic cigarette user plasma nicotine concentration, puff topography, heart rate, and subjective effects: Influence of liquid nicotine concentration and user experience. *Experimental and Clinical Psychopharmacology*, 25(5), 380-392. <https://doi.org/10.1037/pha0000140>
- Hurt, R. D., Dale, L. C., Offord, K. P., Lauger, G. G., Baskin, L. B., Lawson, G. M., Jiang, N.-S., & Hauri, P. J. (1993). Serum nicotine and cotinine levels during nicotine-patch therapy. *Clinical Pharmacology & Therapeutics*, 54(1), 98-106. <https://doi.org/10.1038/clpt.1993.117>
- Kong, G., Bold, K. W., Cavallo, D. A., Davis, D. R., Jackson, A., & Krishnan-Sarin, S. (2021). Informing the development of adolescent e-cigarette cessation interventions: A qualitative study. *Addictive Behaviors*, 114, 106720. <https://doi.org/10.1016/j.addbeh.2020.106720>
- Martinelli, T., Candel, M. J. J. M., de Vries, H., Talhout, R., Knapen, V., van Schayck, C. P., & Nagelhout, G. E. (2021). Exploring the gateway hypothesis of e-cigarettes and tobacco: A prospective replication study among adolescents in the Netherlands and

Flanders. *Tobacco Control*, 0, 1-9. <https://doi.org/10.1136/tobaccocontrol-2021-056528>

Przulj, D., Wehbe, L., McRobbie, H., & Hajek, P. (2019). Progressive nicotine patch dosing prior to quitting smoking: Feasibility, safety and effects during the pre-quit and post-quit periods. *Addiction*, 114(3), 515-522. <https://doi.org/10.1111/add.14483>

Sanchez, S., Kaufman, P., Pelletier, H., Baskerville, B., Feng, P., O'Connor, S., Schwartz, R., & Chaiton, M. (2021). Is vaping cessation like smoking cessation? A qualitative study exploring the responses of youth and young adults who vape e-cigarettes. *Addictive Behaviors*, 113, 106687. <https://doi.org/10.1016/j.addbeh.2020.106687>

Simpson, K. A., Kechter, A., Schiff, S. J., Braymiller, J. L., Yamaguchi, N., Ceasar, R. C., Bluthenthal, R. N., & Barrington-Trimis, J. L. (2021). Characterising symptoms of e-cigarette dependence: A qualitative study of young adults. *BMC Public Health*, 21(1), 959. <https://doi.org/10.1186/s12889-021-10945-z>

Su, W.-C., Wong, S.-W., & Buu, A. (2021). Deposition of e-cigarette aerosol in human airways through passive vaping. *Indoor Air*, 31(2), 348-356. <https://doi.org/10.1111/ina.12754>

van der Plas, A., Pouly, S., Blanc, N., Haziza, C., de La Bourdonnaye, G., Titz, B., Hoeng, J., Ivanov, N. V., Taranu, B., & Heremans, A. (2020). Impact of switching to a heat-not-burn tobacco product on CYP1A2 activity. *Toxicology Reports*, 7, 1480-1486. <https://doi.org/10.1016/j.toxrep.2020.10.017>

PROFESSOR RENEE BITTOUN: NICOTINE ADDICTION UNIT – LIFESTYLE MEDICINE AND HEALTH RESEARCH CENTRE

© 2021. This work is licensed under a [CC BY-NC-ND 4.0 license](https://creativecommons.org/licenses/by-nc-nd/4.0/).

WANT TO LEARN MORE? CALL +61 2 49802377 TO ENQUIRE ABOUT AVONDALE UNIVERSITY'S POST-GRADUATE "NICOTINE ADDICTION & SMOKING CESSATION" MICRO-CREDENTIAL