

# Graphic Health Warnings on Tobacco Packages

Fact sheet 9: Smoking is highly addictive

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Nicotine is the addictive substance in cigarette smoke. It is present in the tobacco leaf and when a cigarette is burnt, nicotine from the tobacco leaf is inhaled in the cigarette smoke by the smoker. Nicotine enters the bloodstream via the lungs and reaches the brain within 10 seconds of inhalation.

Tobacco addiction is considered to consist of two medically defined disorders – nicotine dependence and nicotine withdrawal.<sup>2</sup>

Nicotine dependence is the continued use of tobacco despite the negative health outcomes of its use. The severity of nicotine dependence varies amongst smokers with more dependent smokers having their first cigarette more quickly on waking in the morning.<sup>1</sup> Nicotine withdrawal is characterised by symptoms of nervousness, restlessness, irritability, anxiety and poor concentration.

The risk of developing dependence following exposure to cigarettes is greater than the risk of developing dependence following initial use of cocaine, alcohol or marijuana.<sup>2</sup>

People who start smoking in their teens are more likely to become life-long smokers than those who have their first cigarette as adults. Despite most adolescent smokers believing they won't be smoking five years after they start, the fact is most will be because tobacco is so addictive. By age 18, two thirds of New Zealand adolescent smokers regret starting and half have tried to quit.<sup>3</sup> Recent animal studies indicate that teen smokers are especially vulnerable to the effects of nicotine and that nicotine addiction may be heightened if smoking is initiated during adolescence.<sup>4</sup>

Cigarette smoking is a complex behaviour that over time becomes powerfully compulsive. Nicotine causes changes in the structure and function of the brain producing both positive experiences such as feelings of arousal, relaxation, and improved concentration and negative withdrawal symptoms such as nervousness, restlessness, irritability, anxiety and impaired concentration. It is difficult to separate the positive effect of nicotine from the relief of negative withdrawal symptoms.

The initial kick experienced by a smoker as nicotine reaches the brain, rapidly wears off as nicotine is redistributed throughout the body and is metabolised. Falling nicotine levels initiate withdrawal symptoms, the intensity of which increase as nicotine levels continue to fall. Smoking another cigarette relieves withdrawal symptoms but only for a short period of time when nicotine levels start to fall again. This variation of nicotine blood levels over the course of a day means a smoker is mostly experiencing states of nicotine withdrawal.

The positive and negative effects of nicotine reinforce smoking behaviours. The reinforcement occurs with every puff of a cigarette – if smoking a pack or more per day, this will occur hundreds of times per day and hundreds of thousands of times per year. Through this process the behaviours of seeking, lighting and inhaling become well entrenched and contribute to the compulsion to smoke.<sup>5</sup>

Tolerance to the effects of nicotine develops with repeated use of tobacco and consequently consumption increases over time but produces only relatively weak effects compared to when smoking first began.<sup>6</sup>

Despite the perception of 'light and mild' and 'low nicotine/tar' cigarettes being a healthier option they are not. Smokers who switch to 'light and mild' and 'low nicotine/tar' cigarettes to reduce their nicotine intake, tend to compensate for the reduced smoke yields of nicotine by smoking the cigarette more deeply or more intensively in order to achieve their required dose of nicotine.<sup>7</sup> Because a smoker may be smoking the cigarette more intensively, they may be exposing themselves to greater amounts of toxic substances in cigarette smoke.

Want to quit smoking? The most important thing is to make a quit attempt. For help, talk to your doctor, pharmacist, quit smoking provider or call the Quitline on 0800 778 778 or visit The Quit Group web site at [www.quit.org.nz](http://www.quit.org.nz)

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Sources:

<sup>1</sup> Henningfield J, Fant R, Buchhalter A and Stitzer M. *Pharmacotherapy for Nicotine Dependence*. CA - A Cancer Journal for Clinicians 2005; 55:281-299.

<http://caonline.amcancersoc.org/cgi/reprint/55/5/281?maxtoshow=&HITS=10&hits=10&RESULTFORMAT=&fulltext=henningfield&searchid=1&FIRSTINDEX=0&resourcetype=HWCIT> (accessed 11/02/08)

Sources:

<sup>2</sup> Henningfield J. 2000. *Tobacco dependence treatment: scientific challenges; public health opportunities*. Tobacco Control 2000; 9(Supplement 1):i3-i10. [http://tc.bmj.com/content/vol9/suppl\\_1/](http://tc.bmj.com/content/vol9/suppl_1/) (accessed 11/02/08)

<sup>3</sup> Henningfield J. 2002. *Statement before the Interagency Committee on Smoking and Health's Subcommittee on Tobacco Cessation*. October 24, 2002.

<http://www.apa.org/ppo/issues/henningfieldtest.html> (accessed 11/02/08)

<sup>4</sup> Zickler P. *Early Nicotine Initiation Increases Severity of Addiction, Vulnerability to Some Effects of Cocaine*. National Institute On Drug Abuse Notes July 2004: 19(2).

[http://www.nida.nih.gov/NIDA\\_notes/NNvol19N2/Early.html](http://www.nida.nih.gov/NIDA_notes/NNvol19N2/Early.html) (accessed 11/02/08)

<sup>5</sup> Henningfield J and Keenan R. *Nicotine Delivery Kinetics and Abuse Liability*. Journal of Consulting and Clinical Psychology 1993: 61(5):743-750. <http://www.apa.org/journals/ccp/> (accessed 11/02/08)

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<sup>6</sup> Henningfield, J and Zeller ETM. *Regulatory strategies to reduce tobacco addiction in youth*. Tobacco Control 2003, 12: 14-24. [http://tc.bmj.com/cgi/content/abstract/12/suppl\\_1/i14](http://tc.bmj.com/cgi/content/abstract/12/suppl_1/i14) (accessed 11/02/08)

<sup>7</sup> Benowitz N. National Cancer Institute. 2001. *Monograph 13: Risks Associated with Smoking Cigarettes with Low-Machine Measured Yields of Tar and Nicotine*. U.S. Department of Health Human Services. October 2001. <http://cancercontrol.cancer.gov/tcrb/monographs/13/> (accessed 11/02/08)