



The following is based on the Canadian Agency for Drugs and Technologies in Health (CADTH) report, *Pharmacologic-based Strategies for Smoking Cessation: Clinical and Cost-Effectiveness Analyses*.

**Smoking** is one of the major risk factors for cancer, diseases that hamper breathing (respiratory disease), and diseases of the heart and blood vessels (cardiovascular disease). Smoking tobacco is a risk factor that can be changed — by quitting permanently. Unfortunately, quitting smoking — or **smoking cessation** — is much easier said than done.

Smoking is an addiction, both physical and mental. **Nicotine** is the addictive chemical found in tobacco products. It triggers the release of a chemical in the brain (called dopamine), which in turn makes people feel happier, more relaxed, and more alert. When the level of nicotine in the brain starts to fall, smokers experience cravings and symptoms of withdrawal, which in turn makes them want to smoke. Smokers can also get the urge to smoke from their surroundings or in situations they associate with smoking.

Approximately one in five Canadians aged 15 years and older smokes, and more than one in every three smokers intend to quit within the next 30 days. However, published data suggest that, in the long-term, many will fail in their attempts to quit smoking without the help of **smoking cessation aids**. Given the number of preventable deaths and evidence indicating that more than 30% of Canadian hospital beds are occupied by adults who are there as a consequence of their smoking habits, there is a need to consider **smoking cessation strategies**.

## Drug Based Smoking Cessation Aids

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### Nicotine replacement therapy (NRT)

- Brand name products available in multiple forms: gum (Nicorette and Thrive), patch (Habitrol, Nicoderm, and Nicotrol), inhaler (Nicorette Inhaler), and lozenge (Nicorette and Thrive)
- Replaces, in a non-toxic manner, the nicotine that a person would normally get from smoking tobacco
- Maintains stimulation of nicotine receptors to minimize or eliminate craving and withdrawal symptoms

### Bupropion

- Brand name Zyban
- A type of medication used to treat depression and as an aid to quit smoking It's not entirely clear how bupropion helps people to quit smoking.

### Varenicline

- Brand name Champix
- A medication that mimics the effect of nicotine Reduces cravings for nicotine and also reduces the pleasurable effects of using tobacco
- To be used alongside supportive counselling

Because smoking is such an important risk factor for a variety of serious health conditions, successfully **quitting can help to prevent illness and death**. And fortunately many smokers want to quit. How can we best help them to quit? Which of the smoking cessation aids works best? Which of these options offers the best value to Canadians and our health care system?

To address these questions, the CADTH carefully reviewed the available research to help provide some answers. In particular, CADTH:

- Compared the drugs to determine which of these works best (*clinical effectiveness*) at six months and 12 months after attempting to quit smoking.
- Performed an economic analysis to determine which smoking cessation therapy was the most cost-effective for patients, drug plans and the Canadian health care system.

### Key Findings from the Clinical Assessment

- Varenicline, bupropion, and NRT are all effective in helping the general population quit smoking and remain smoke-free one year later.
- The use of NRT and bupropion generally doubles the odds of a smoker quitting successfully, and the use of varenicline can increase the odds of quitting by between twofold and threefold compared with not using any drug therapy.
- Bupropion or NRT are effective in helping smokers with cardiovascular disease or chronic obstructive pulmonary disease to quit smoking.

### Key Findings from the Economic Assessment

- Varenicline and bupropion are more cost-effective compared to NRTs, for the general population.
- If a provider is willing to pay more than \$10,000 per quality-adjusted life-year (QALY) gained, then varenicline was the optimal treatment choice compared to NRT and bupropion.

### Smoking Prevalence and Budget Impact

The budget impact of reimbursing varenicline and bupropion is estimated in the table below, based on Quebec 2007 to 2008 smoking cessation pharmacotherapy claims data for eligible smokers. Projected increases in varenicline prescriptions range from 0% to 50%. It is worth noting however, that in 2008, Canadian varenicline prescriptions grew by 350%.

Province	Smoking prevalence	Number of smokers	Budget impact
British Columbia	14.4%	524,592	
Alberta	20.9%	582,274	
Saskatchewan	24.0%	189,600	\$0.7 to 2.3 million
Manitoba	19.9%	187,657	
Ontario	18.2%	1,899,352	\$7 to 23 million
Quebec	21.7%	1,380,988	\$0.2 to 8.1 million
New Brunswick	21.2%	132,076	\$0.5 to 1.6 million
Nova Scotia	20.4%	158,916	
Prince Edward Island	18.4%	20,976	
Newfoundland and Labrador	21.2%	90,100	

Note: The budget impact above was predicted in 2009 for the time periods, 2008-2009, 2009-2010 and 2010-2011.

## For Consideration

- Individual preference and clinical response are important in determining choice of therapy.
- The clinical studies were conducted in the general population of smokers who were motivated to quit smoking. This might provide more optimistic quit rates than would be seen in actual practice.
- The economic evaluation only considered one course of pharmacotherapy (i.e., those who fail to quit after their first attempt did not receive a subsequent course of therapy), similar to the approach of previously published economic analyses.
- The economic evaluation considered brand name prices, although bupropion and NRTs are available as generics. (Use of generic bupropion for smoking cessation, however, would result in off-label use).

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This summary is based on comprehensive health technology report on the topic prepared by the Canadian Agency for Drugs and Technologies in Health (CADTH). Updated September 2011.

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