衞生署控煙酒辦公室
Tobacco and Alcohol Control Office
Department of Health

Pharmacotherapy for Smoking Cessation

1. Introduction

- Pharmacotherapy for smoking cessation can be broadly divided into nicotine replacement therapy ("NRT") and non-nicotine medications.
- NRT and non-nicotine medications (e.g. varenicline) are first-line treatments for non-pregnant adult smokers seeking pharmacotherapy to quit smoking.[1,2]

2. Effectiveness of NRT for smoking cessation

- NRT can increase tobacco abstinence rate in adults by 55% (Relative risk (RR) 1.55, 95% confidence interval (CI) 1.49 to 1.61) at 6 months or longer when compared with placebo or no NRT. [3]
- When comparing different formulations, dosages, durations and schedules of NRT for smoking cessation:[4]
    - combining a short-acting (e.g. gums) and a long-acting form (e.g. patch) of NRT (combined NRT) can increase the quit rate by 25% (RR 1.25, 95% CI 1.15 to 1.36) compared with a single form of NRT (monotherapy).
    - the quit rates of different formulations of NRT (e.g. patch vs gum) are similar.
- Evidence is inconclusive for whether NRT is effective in increasing abstinence in adolescents.[5]

3. How NRT works

- During a quit attempt, people often experience withdrawal symptoms (e.g. craving to smoke, dizziness, headache, poor concentration) which are the main reasons for failed quit attempt.
- NRT replaces the nicotine without exposing the body to harmful substances in tobacco, thereby reducing urges to smoke and the withdrawal symptoms in the quitting process.
- NRT delivers nicotine at a lower level than cigarettes and is much less addictive. Most people do not become dependent on NRT. [6]

NRT is available in different formulations:

Formulations	Route of absorption	Dosage available
Transdermal patch*	Skin	16 hrs: 5mg; 10mg; 15mg 24 hrs: 7mg; 14mg; 21mg
Chewing gum*	Oral mucosa	2mg; 4mg
Lozenge	Oral mucosa	1mg; 2mg; 4mg

Adapted from World Health Organization ("WHO") (2013)[7]
* On WHO Model List of Essential Medicines

- Transdermal patches are long-acting and deliver nicotine passively for a prolonged period (16 hrs to 24 hrs).
- Chewing gums and lozenges are short-acting and allow the users to control the amount of intake.
- Compliance of NRT for transdermal patches is higher than gums. [8]

- Oral forms of NRT (chewing gum and lozenge) may act as oral substitutes for tobacco products.[3]

4. How to use NRT

- A course of NRT lasts from 8 to 12 weeks.
- The initial dosing of NRT depends on the level of nicotine dependence, which can be assessed by the number of cigarettes per day ("CPD") and time to first cigarette of the day ("TFCD") of the users. A greater CPD or shorter TFCD indicate a higher level of nicotine dependence.
- Dosing of the NRT can be tapered as tolerated.
- Guideline on commonly used NRT:

Formulations	Method of administration	Dosing
Transdermal patch	1. Apply a patch to a clean, dry and hairless skin of the upper chest, back, upper arms, or hips. Press for 10 seconds 2. Change the application site daily 3. Replace the patch daily	• Use 1 patch/ day • CPD <10: 14mg/day • CPD 10-20: 14-21mg/day • CPD 21-39: 28-35mg/day • CPD ≥40: 42mg/day • Duration: 8 – 12 weeks
Chewing gum	1. Slowly chew the gum (about 10 to 15 times) until a strong taste release 2. Stop chewing and place the gum between cheek and gum 3. If the taste fades away, repeat step 1 and 2 until the gum becomes tasteless 4. No eating or drinking 15 mins before and during use	• Based on CPD: o CPD ≤20: 2mg o CPD >20: 4mg • Based on TFCD: o TFCD > 30 mins: 2mg o TFCD ≤30 mins: 4mg • Take 1 piece every 1–2 hours (about 10–12 daily) • Taper as tolerated • Maximum 24 pieces/ day • Duration: up to 12 weeks
Lozenge	1. Place the lozenge in mouth and allow it to dissolves 2. Move the lozenge to different places in the mouth 3. Do not chew or swallow	• Based on CPD: o CPD ≤20: 2mg o CPD >20: 4mg • Based on TFCD: o TFCD > 30 mins: 2mg o TFCD ≤30 mins: 4mg • Take 1 piece every 1–2 hours (about 10–12 daily) • Maximum 20 pieces/ day • Duration: up to 12 weeks

Adapted from WHO (2013)[7]

- Use of NRT in smokers with the following conditions require medical supervisions:
    - Aged <18 years
    - Pregnancy and breastfeeding
    - Recent (≤2weeks) myocardial infarction
    - Serious arrhythmia
    - Unstable angina
- Contraindications specific to the type of NRT
    - Transdermal patch: Severe dermatological conditions (e.g., eczema, psoriasis)
    - Gums: Temporomandibular joint disease

5. Side effects of NRT

- Adverse effects of NRT are generally mild and self-limiting. Serious adverse effects of NRT are extremely rare.
- According to a meta-analysis of observational studies (n>70 000), commonly (>5%) reported side effects of NRT include:[9]

Common side effects	Prevalence
Sleep problem (e.g. insomnia, vivid dreams)	11.4%
Headache	9.7%
Nausea and vomiting	8.5%
Coughing	8.1%
Dizziness	7.3%

- Some side effects are mainly dependent on the formulation (site of absorption) of the NRT:

Formulations	Side effects	Potential solution
Transdermal patch	1. Skin irritation 2. Sleep problems (e.g. insomnia, vivid dreams) due to nocturnal nicotine intake	• Change the application site daily • Can wear the patch for 16 hours during daytime and remove at bedtime
Oral form of NRT (Chewing gum/ Lozenge)	1. Mouth and throat irritation 2. Gastrointestinal ("GI") disturbance • Hiccups • Indigestion • Heartburn 3. Cough	• GI disturbances are largely related to GI intake of nicotine, which can be minimised by avoiding swallowing during use/ suckling of the lozenge

6. Non-nicotine medication - Varenicline

- Varenicline is a non-nicotine medication that is approved by the U.S. Food and Drug Administration for treating tobacco use.[1]
- Varenicline is a nicotinic receptor partial agonist which helps smoking cessation by reducing withdrawal symptoms and inhibiting the rewarding effect of nicotine.[10]
- Varenicline increases tobacco abstinence rate at 6 months or longer by 124% (RR 2.24, 95% CI 2.06 to 2.43) compared with placebo.[10]
- Varenicline increases tobacco abstinence rate at 6 months by 25% compared with NRTs.[10]
- Varenicline use is not suitable for individuals:[7]
    - Aged <18 years
    - Who are pregnant or breastfeeding
    - Have severe renal impairment (dosage adjustment required)
- Regarding the relationship between the use of varenicline and mental health, 2 large meta-analyses of randomised controlled trials show no evidence of increased risk of neuropsychiatric adverse events in users.[11,12]
- However, when trying to quit smoking with or without drug, some quitters may have new or worsening mental health problems. These happen more often in those with a history of mental health problems before trying to quit.[13]
- Patient is advised to stop varenicline and contact healthcare professionals immediately if they experience agitation, depressed mood, suicidal thoughs or behaviours, or any changes in behavior that are not typical of nicotine withdrawal. [7,13]
- Common side effects of varenicline are generally self-limiting and include:[10]
    - Nausea
    - Headache
    - Insomnia
    - Abnormal dreams

7. How to obtain NRT and Varenicline in Hong Kong

- Both form of pharmacotherapy are provided free-of-charge by the non-government organisations subvented by the Department of Health who provided smoking cessation services.
- Free-of-charge mail delivery of NRT is also available under some smoking cessation programmes.
- NRT (transdermal patch, chewing gum, and lozenge) can also be purchased over-the-counter.
- Varenicline is a prescription only medicine which can be purchased in a pharmacy only with a prescription.
- For further details, please refer to the "Practical Handbook for Smoking Cessation Treatments" published by the Tobacco and Alcohol Control Office of the Department of Health or visit www.livetobaccofree.hk.

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