SUBSTANCE USE DISORDER AGENT

Nicotine Replacement Therapy

NicoDerm CQ, Habitrol, Nicorette, Nicotrol NS, Nicotrol Inhaler

Nicotinic agonist delivered without combustion products; first-line, widely available pharmacotherapy for tobacco dependence.

USUAL ADULT DOSE	HALF-LIFE	METABOLISM	ONSET
21 mg/24 h patch plus PRN gum	2 h (cotinine about 16 h)	CYP2A6 to cotinine	Patch 2-4 h; gum 10-20 min

No FDA boxed warning on the current US label.

INDICATIONS

- FDA-approved to reduce withdrawal symptoms and aid smoking cessation in adults, with patch, gum and lozenge available over the counter.
- Nasal spray and oral inhaler remain prescription-only and suit highly dependent smokers who need rapid craving relief.
- Combination therapy pairing a long-acting patch with a short-acting form is more effective than any single product and is now standard practice.
- Recommended by USPSTF and VA/DoD as first-line pharmacotherapy, and the preferred option in pregnancy when medication is judged necessary.
- Preloading before the quit date and reduce-to-quit schedules both increase abstinence and are supported by randomized evidence.
- Off-label uses include craving control for hospitalized inpatients who cannot smoke and short-term relief in smokeless tobacco users.

DOSING & TITRATION

- Patch for more than 10 cigarettes daily: **21 mg/24 h** for 6 weeks, then 14 mg for 2 weeks, then 7 mg for 2 weeks; start at 14 mg if lighter.
- Gum: **2 mg** if the first cigarette comes more than 30 min after waking, **4 mg** if sooner; one piece every 1-2 h, up to 24 pieces daily.
- Use the chew-and-park technique with gum and let lozenges dissolve without chewing; avoid acidic drinks for 15 min before and during use.
- Lozenge dosing mirrors gum at 2 mg or 4 mg with a maximum of 20 units daily; the mini-lozenge dissolves faster with the same strengths.
- Nasal spray is 1-2 doses per hour to a maximum of 5 per hour or 40 daily; the inhaler is 6-16 cartridges daily.
- Treat for at least 8-12 weeks and extend when craving persists; long-term use is far safer than returning to cigarettes.

MECHANISM OF ACTION

- Agonist at nicotinic acetylcholine receptors, chiefly alpha4beta2, occupying the same receptors that maintain tobacco dependence.
- Delivers nicotine more slowly and at lower peaks than inhaled smoke, which relieves withdrawal without reinforcing the addiction.
- The patch supplies steady baseline receptor occupancy while gum, lozenge, spray or inhaler cover cue-triggered craving surges.
- Buccal absorption is pH-dependent, so acidic beverages and coffee lower the pH of the mouth and sharply reduce nicotine uptake.
- Nicotine itself does not cause the malignancy and lung disease of smoking; combustion products such as tar and carbon monoxide do.

PHARMACOKINETICS

- The transdermal patch reaches plateau concentrations in 2-4 h and is supplied in 16 h and 24 h formats at 7, 14 and 21 mg strengths.
- Plasma nicotine half-life is about **2 h** while the metabolite cotinine persists roughly **16 h**, which is why cotinine is used for verification.
- Metabolized mainly by CYP2A6 to cotinine, with clearance faster in pregnancy, in menthol users and in rapid-metabolizer genotypes.
- Swallowed nicotine is largely destroyed by first-pass metabolism, so gum and lozenge must be absorbed across the buccal mucosa.
- The nasal spray gives the fastest rise, peaking near 10 min, while the inhaler is actually absorbed buccally rather than in the lung.

ADVERSE EFFECTS

- Local skin irritation or erythema affects up to half of patch users; rotate sites daily and treat with topical hydrocortisone if needed.
- Vivid dreams and insomnia are common with the 24 h patch and usually resolve if the patch is removed at bedtime.
- Gum causes jaw ache, hiccups, dyspepsia and mouth soreness, most of which trace back to chewing too fast rather than parking.
- Nasal spray produces nasal and throat irritation, sneezing, coughing and watery eyes in the majority of users during the first week.
- Symptoms of excess nicotine include nausea, dizziness, palpitations and headache, and are relieved by reducing the dose or frequency.
- Ingestion of gum, lozenges or a discarded patch by a young child or pet can be serious, so storage and disposal must be discussed.

MONITORING

- Track cigarettes per day, withdrawal symptoms and craving at weeks 1, 2 and 4, and raise the dose if craving persists rather than stopping.
- Inspect patch sites and review chewing or dissolving technique, since poor technique is the commonest cause of apparent failure.
- Recheck clozapine, olanzapine and theophylline levels one to two weeks after the patient stops smoking, regardless of NRT use.
- Exhaled carbon monoxide or urinary anabasine can verify abstinence, since cotinine will remain positive during NRT itself.
- Reassess mood in psychiatric patients, because nicotine withdrawal can transiently worsen depression and anxiety.

INTERACTIONS & CAUTIONS

- Stopping the smoke, not the nicotine, removes CYP1A2 induction and can nearly double clozapine, olanzapine, fluvoxamine and theophylline levels.
- Caffeine clearance also falls after quitting, so the same coffee intake produces more jitteriness, insomnia and anxiety.
- Acidic beverages including coffee, juice and soft drinks block buccal absorption of gum and lozenges for about 15 min.
- Combining NRT with varenicline or bupropion improves abstinence and is safe, though nausea and headache become more common.
- Nicotine itself has no significant CYP-mediated interactions, so no psychotropic dose change is required for the NRT product.

SPECIAL POPULATIONS

- Pregnancy: behavioral treatment comes first; if NRT is used, intermittent forms are preferred and clearance is faster, so under-dosing is common.
- Lactation: far preferable to continued smoking; use short-acting forms and dose immediately after a feed to minimize milk levels.
- Pediatric labeling is for age 18 and older, and trial evidence for efficacy in adolescents is weak, so counseling remains the mainstay.
- Geriatric patients tolerate NRT well; the main issues are skin integrity with patches and dentures interfering with gum.
- Cardiovascular disease: NRT is safe in stable disease, but label caution applies within 2 weeks of myocardial infarction or with unstable angina.

PRESCRIBING PEARLS

- Patch plus PRN gum or lozenge beats any single form; most failures are simply under-dosed.
- No coffee, juice or soda for 15 min around gum or lozenge, or the nicotine will not absorb.
- Nicotine does not cause the cancer, the smoke does; say so plainly to justify long-term NRT.

References

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NOTE

References follow APA 7th edition style. Dosing, boxed warnings, and interaction data change; confirm every clinical decision against the current FDA prescribing information (DailyMed) and your institution's formulary. This sheet is an educational quick reference and does not replace the full label or clinical judgment.