

QUITTING SMOKING DURING RADIATION

Your Guide to a Smoke-Free
Treatment & Recovery

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Evidence-based protocols from NCCN, American Cancer Society, NEJM, JAMA Oncology, and CDC clinical practice guidelines

Why Quitting Now Changes Everything

You have made the decision to fight your cancer with radiation therapy. Quitting smoking is **the single most important thing you can do right now** to help your treatment succeed. This is not a lecture — it is a medical fact that will directly affect your outcome.

The Science: How Smoking Sabotages Radiation

Radiation therapy works by damaging cancer cell DNA. But here's the critical part: radiation needs **oxygen** to be most effective. Well-oxygenated tumor cells are **3 times more sensitive** to radiation than oxygen-starved cells.

When you smoke, carbon monoxide from cigarettes binds to your red blood cells (forming carboxyhemoglobin), **reducing oxygen delivery to your tumor by up to 15%**. This creates “tumor hypoxia” — exactly the conditions that let cancer cells survive radiation.

Translation: Every cigarette you smoke during radiation gives your cancer cells a better chance of surviving treatment.

The Numbers That Matter

These are not estimates. These are published results from clinical trials:

Outcome	Quitters / Non-Smokers	Continued Smokers	Source
Complete tumor response	74%	45%	Browman et al., NEJM 1993
2-year overall survival	66%	39%	Browman et al., NEJM 1993
2-year survival (SBRT, lung)	78%	55%	PubMed 26598909
Locoregional recurrence risk	Baseline	2.2x higher	Meta-analysis, 2019
Mortality risk	Baseline	1.85x higher	Meta-analysis, 2019
Severe mucositis (H&N; RT)	Lower	Significantly higher	PMC 9031077

Bottom line: Quitting smoking during radiation therapy can improve your cure rate by 30–50% and cut your risk of recurrence nearly in half. No other intervention you can do on your own has this much impact.

It Is Never Too Late — Even With Advanced Cancer

A 2025 study from JNCCN tracked over **13,000 cancer patients** and found that those who quit smoking within 6 months of diagnosis had **half the risk of dying** compared to those who kept smoking. This benefit held across **all cancer types and stages — including stages III and IV** — where patients who quit gained nearly **a full additional year of life** over those who continued smoking.

If anyone has ever told you “what’s the point, I already have cancer” — this study proves them wrong. Every day you don’t smoke matters.

Your Body Starts Healing Immediately

The moment you stop smoking, your body begins to repair itself. These improvements happen on a predictable timeline:

After Quitting	What Happens in Your Body
20 minutes	Heart rate and blood pressure drop toward normal.
2 hours	Circulation improves. Hands and feet feel warmer.
24 hours	Carbon monoxide eliminated from blood. Heart attack risk drops. Oxygen delivery to your tumor begins improving.
48 hours	Nerve endings start regenerating. Taste and smell sharpen.
72 hours	No nicotine remaining in your body. Bronchial tubes relax. Breathing becomes easier.
2 weeks	Circulation significantly improved. Lung function starts increasing. Your radiation treatments become more effective.
1 month	Coughing and shortness of breath decrease. Cilia (tiny hair-like structures in your lungs) regain function — clearing mucus and reducing infection risk.
3–9 months	Lung function increases by up to 10%. Coughing, wheezing, and breathing problems continue to improve.
1 year	Heart attack risk drops to 50% of a smoker’s.
10 years	Lung cancer risk drops to 50% of a continuing smoker’s.

For radiation patients specifically: Within 24–48 hours of quitting, your blood’s oxygen-carrying capacity begins improving — meaning your radiation treatments start working better almost immediately.

The Golden Rules

1. Set a Quit Date — Ideally Before Treatment Starts

Pick a date, tell your care team, and start medication 1–2 weeks before. If treatment has already started: **quit today**. Even quitting mid-treatment improves outcomes. There is no point at which it's “too late.”

2. Use Medication — Don't White-Knuckle It

Willpower alone has a ~5% success rate at 1 year. Adding medication (NRT, varenicline, or bupropion) nearly **triples** your chance of quitting successfully. Combining medication + counseling raises 1-year success to ~25%. Ask your team today.

3. Tell Everyone on Your Care Team

Your radiation oncologist, nurse, and social worker all have resources to help. We check in at every visit. There is zero judgment — only support.

4. Plan for Cravings — They Pass in 3–5 Minutes

Cravings feel overwhelming but are physiologically brief. Have a plan: the 4 D's — **Delay, Deep-breathe, Drink water, Do something else**. Keep fast-acting NRT (gum or lozenge) within reach for breakthrough urges.

Medications That Help You Quit

Multiple FDA-approved medications are safe and effective for cancer patients. Your care team will help you choose the right option. **Using medication is not weakness — it is smart medicine.**

Option 1: Nicotine Replacement Therapy (NRT)

NRT provides controlled nicotine without the 7,000+ chemicals in cigarettes. Available over-the-counter (patches, gum, lozenges) or by prescription (inhaler, nasal spray).

Form	Dose	How to Use	Notes	Rx?
Nicotine Patch	21 mg, 14 mg, or 7 mg daily	>10 cig/day → start 21 mg ≤10 cig/day → start 14 mg Step down every 2–4 weeks	Steady nicotine all day. Apply to clean, dry, hairless skin. Rotate sites daily.	OT C
Nicotine Gum	2 mg or 4 mg pieces	First cig >30 min after waking → 2 mg First cig <30 min after waking → 4 mg 8–12 pieces/day	Chew slowly until peppery taste, then “park” between cheek and gum. Repeat. Do NOT chew like regular gum.	OT C

Form	Dose	How to Use	Notes	Rx?
Nicotine Lozenge	2 mg or 4 mg	Same selection rule as gum Use every 1–2 hours	Let dissolve slowly (20–30 min). Do not chew or swallow whole. Discreet and easy to use.	OT C
Nicotine Inhaler	10 mg cartridge	6–16 cartridges/day	Mimics hand-to-mouth habit. Absorbed through mouth lining, not lungs.	Rx
Nicotine Nasal Spray	0.5 mg/spray	1–2 sprays per nostril, up to 5x/hour	Fastest-acting NRT. Best for heavy smokers with strong cravings.	Rx

Pro tip — Combination NRT: Using a patch (steady baseline) PLUS a fast-acting form (gum or lozenge for breakthrough cravings) is ~25% more effective than either alone. Ask your team about starting both.

Option 2: Varenicline (Chantix)

Varenicline is a **prescription medication** that works differently from NRT. It partially activates the same brain receptors that nicotine does, reducing cravings AND making smoking less satisfying if you do slip.

Dosing schedule:

- **Days 1–3:** 0.5 mg once daily
- **Days 4–7:** 0.5 mg twice daily
- **Day 8 onward:** 1 mg twice daily
- **Duration:** 12 weeks standard; can extend to 24 weeks for relapse prevention
- **Start 1–2 weeks BEFORE your quit date**

Efficacy: ~35% quit rate at 12 weeks in cancer patients — the highest of any single medication.

Common side effects: Nausea (take with food and full glass of water), vivid dreams, insomnia, headache.

Option 3: Bupropion (Wellbutrin SR / Zyban)

Bupropion is an **antidepressant that also reduces nicotine cravings**. Good option if you also have depression or anxiety, or if you want a non-nicotine medication.

Dosing schedule:

- **Days 1–3:** 150 mg once daily
- **Day 4 onward:** 150 mg twice daily (at least 8 hours apart)

- **Duration:** 7–12 weeks
- **Start 1–2 weeks BEFORE your quit date**

Efficacy: ~25% quit rate. Doubles success compared to willpower alone.

Important: Do NOT use if you have a history of seizures, eating disorders, or are abruptly stopping alcohol or benzodiazepines.

On the Horizon: Cytisinicline

Cytisinicline is a **plant-derived medication** currently under FDA review (decision expected mid-2026). If approved, it would be the **first new smoking cessation drug in over 20 years**. It works similarly to varenicline — a partial nicotinic receptor agonist that reduces cravings and makes smoking less rewarding.

In the ORCA-3 Phase 3 trial (JAMA Internal Medicine, 2025): a 12-week course achieved a **30.3% quit rate** vs 9.4% placebo, with 20.5% continuous abstinence at 24 weeks. Well tolerated with no treatment-related serious adverse events.

Ask your care team whether cytisinicline is available yet. It may provide a new option, especially if other medications haven't worked for you.

Quick Comparison

Approach	1-Year Quit Rate	Cost	Notes
Willpower alone	~5%	Free	—
NRT (single form)	~20%	\$25–40/mo OTC	Patch OR gum OR lozenge
Combination NRT	~25%	\$40–65/mo	Patch + gum/lozenge (most effective NRT)
Varenicline (Chantix)	~35%	Rx — insurance	Highest single-agent quit rate
Bupropion (Wellbutrin)	~25%	Rx — insurance	Also helps mood/depression
Cytisinicline (pending)	~30%	TBD (FDA mid-2026)	Plant-derived; well tolerated
Medication + Counseling	~25–35%	Varies	THE recommended approach (NCCN)

Behavioral Strategies That Work

Medication handles the physical addiction. Behavioral strategies handle the **habits, triggers, and emotional patterns** that keep you reaching for cigarettes. Both together are more effective than either alone.

Know Your Triggers

Most smokers have predictable triggers. Identifying yours is the first step to breaking the pattern:

- **Morning routine:** Coffee + cigarette. Switch to tea, or take a short walk instead.
- **Stress / anxiety:** Deep breathing, call a friend, chew gum, squeeze a stress ball.
- **After meals:** Brush teeth immediately, take a walk, chew sugar-free gum.
- **Driving:** Remove ashtrays/lighters from car. Keep gum or lozenges in the console.
- **Social situations:** Tell friends you're quitting. Avoid smoking areas initially.
- **Boredom:** Keep hands busy (puzzles, phone games, knitting). Plan activities.

The 4 D's — When a Craving Hits

Cravings are intense but **short-lived (3–5 minutes)**. Ride them out with:

1. **Delay:** Wait it out. Set a timer for 5 minutes. Most cravings will pass.
2. **Deep-breathe:** Slow, deep breaths. Inhale for 4 counts, hold for 4, exhale for 6. Repeat 5 times.
3. **Drink water:** Sip cold water slowly. Occupies your mouth and hands.
4. **Do something else:** Walk, call someone, chew gum, do a puzzle. Anything that shifts your attention for 5 minutes.

Preparing Your Environment

- Throw away ALL cigarettes, lighters, ashtrays, and matches — every single one.
- Clean your car, clothes, and home to remove the smell of smoke.
- Tell family and friends you are quitting and ask for their support.
- If your partner smokes: ask them to smoke outside and keep cigarettes out of sight.
- Stock up on sugar-free gum, hard candies, carrot sticks, and sunflower seeds.
- Download a quit-smoking app (see Resources section).

If You Slip — It Is Not Over

Most successful quitters needed **multiple attempts** before quitting for good. A slip (one or a few cigarettes) is NOT the same as a relapse (going back to regular smoking). Here's what to do:

1. **Don't catastrophize.** One cigarette does not erase your progress. Get right back to not smoking.
2. **Learn from it.** What triggered the slip? Stress? Social pressure? Alcohol? Identify it and plan for next time.

3. **Tell your care team.** We can adjust your medication, add support, or change strategy. No judgment.
4. **Reset your quit date** if needed. Pick a new date, recommit, and try again.

***KEY MESSAGE:** The average smoker tries 8–11 times before quitting permanently. Each attempt teaches you something. Persistence wins.*

A Note on E-Cigarettes and Vaping

You may be wondering whether switching to e-cigarettes or vaping is a good alternative. Here is what the evidence says for cancer patients:

- **E-cigarettes are NOT FDA-approved for smoking cessation.**
- The American Cancer Society and International Association for the Study of Lung Cancer **advise against** recommending e-cigarettes for cancer patients.
- E-cigarette aerosol still contains nicotine, ultrafine particles, volatile organic compounds, and potentially cancer-causing chemicals.
- The long-term health effects of vaping are **still unknown**.
- FDA-approved NRT (patches, gum, lozenges) delivers nicotine **without** the harmful chemicals found in e-cigarette vapor.

***Our recommendation:** Use FDA-approved medications (NRT, varenicline, or bupropion) rather than e-cigarettes. They are proven, regulated, and safer.*

Smoking and Your Specific Treatment

During Radiation Therapy

- **Increased toxicity:** Smokers experience more severe skin reactions, mucositis, esophagitis, and cough during RT.
- **Impaired healing:** Smoking constricts blood vessels and reduces oxygen, slowing tissue repair from radiation damage.
- **More treatment breaks:** Higher toxicity may force treatment interruptions, which reduce cure rates.

If You Are Also Receiving Immunotherapy

If you are receiving immunotherapy (durvalumab, pembrolizumab, nivolumab), here is an important nuance: patients who *used to smoke* but quit often respond **better** to immunotherapy than never-smokers (because past smoking creates changes in the tumor that immunotherapy can target). However, **continuing to smoke actively suppresses your immune system** and undermines this advantage:

- Smoking dysregulates your immune system
- Increases immunosuppressive regulatory T cells
- Decreases natural killer (NK) cell function
- May increase PD-L1 expression on tumor cells

The takeaway: Your smoking history may actually help immunotherapy work — but **only if you stop now**. Current smokers have worse immunotherapy outcomes than former smokers. Quitting converts a risk factor into a potential advantage.

Second Primary Cancer Risk

Patients who have received radiation AND continue smoking have a **79% higher risk of developing a second cancer** compared to non-irradiated non-smokers. The combination of radiation-induced DNA changes and ongoing tobacco carcinogen exposure is particularly dangerous. Quitting eliminates the additive tobacco component of this risk.

Free Resources to Help You Quit

You do not have to do this alone. These resources are **free** and available right now.

***Why digital tools matter:** A 2025 analysis of 152 clinical trials (Nature Human Behaviour) found that personalized text and app-based quit programs improve cessation rates by **63–93%** compared to standard care. They work — especially for middle-aged adults.*

Resource	What It Offers
1-800-QUIT-NOW (1-800-784-8669)	National quitline. Free coaching, personalized quit plans, and sometimes free NRT. Available in all 50 states. Multilingual support.
Smokefree.gov	NIH program with web tools, quit plans, and progress tracking.
SmokefreeTXT	Free 8-week text program from NIH. Personalized messages timed around your quit date: prep tips, craving strategies, milestone celebrations. Text QUIT to 47848 to enroll.
quitSTART app	Free smartphone app from NIH. Quit planning, craving tips, progress tracking.
Your Social Worker	Ask at your next appointment. Can connect you with local counseling, support groups, and insurance-covered cessation programs.

Multilingual Quitlines

- **Spanish:** 1-855-DÉJELO-YA (1-855-335-3569)
- **Korean:** 1-800-556-5564
- **Vietnamese:** 1-800-778-8440

- **Mandarin/Cantonese:** 1-800-838-8917

When to Call Your Care Team

Contact us if you experience any of the following:

Concern	Details
Severe withdrawal symptoms	Anxiety, irritability, insomnia, depression interfering with daily life
Side effects from quit meds	Severe nausea, mood changes, skin reactions from patches, seizure-like symptoms
Relapse to regular smoking	We can adjust your plan — no judgment, just support
Depression or hopelessness	Quitting can unmask or worsen depression — we have treatments
Weight gain concerns	Some weight gain is normal; we can help manage it

Recommended Products

Below are commonly recommended products. These are suggestions, not endorsements — equivalent brands work fine.

Category	Product	Est. Cost
NRT	Nicotine patches (NicoDerm CQ, 14-ct)	~\$30
NRT	Nicotine gum (Nicorette, 100-ct)	~\$35
NRT	Nicotine lozenges (Nicorette Mini, 81-ct)	~\$35
Oral Subs	Sugar-free gum (Trident, bulk)	~\$8
Oral Subs	Sugar-free hard candies	~\$6
Oral Subs	Sunflower seeds (in-shell)	~\$5
Stress Relief	Stress ball / fidget toy	~\$5
Stress Relief	Deep-breathing app (free)	\$0
Tracking	quitSTART app (NIH, free)	\$0
Tracking	SmokefreeTXT (text QUIT to 47848)	\$0

Prescriptions (varenicline, bupropion, nicotine inhaler/spray) will be sent to your pharmacy by your care team.

Important Contact Information

Main Line Health — Radiation Oncology

100 East Lancaster Ave · Rosengarten Bldg, Basement · Wynnewood, PA 19096

1078 West Baltimore Pike · Health Center 1, Ground Floor · Media, PA 19063

Phone

Appointment Line: 1.866.CALL.MLH (1.866.225.5654)

If you are experiencing a life-threatening emergency, call 911.

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My Treatment Journal

A place to notice patterns, remember questions, and track what helps.

You do not need to fill this out perfectly. Even a few notes can help you see patterns, remember what worked, and tell your care team what is actually happening at home.

This Week

Week of / goals / anything I especially want help with

Daily Check-In

Day / Date	Energy (0-10)	Pain (0-10)	Eating / Drinking	Sleep	Main note
Mon					
Tue					
Wed					
Thu					
Fri					
Sat					
Sun					

Symptoms I Want to Watch

<input type="checkbox"/> Cravings	<input type="checkbox"/> Triggers	<input type="checkbox"/> Nicotine replacement
<input type="checkbox"/> Mood / irritability	<input type="checkbox"/> Cough / breathing	<input type="checkbox"/> Wins / smoke-free days
<input type="checkbox"/> Other: _____		

What I Tried / What Helped

Use this page to test small changes and keep track of what helps, what does not, and what you want to ask about next.

Problem or symptom	What I tried	Did it help?	Next step / question

Examples: taking pain medicine before meals, changing skin care timing, drinking earlier in the day, using a humidifier, adjusting fiber, walking after treatment, or asking for a refill.

Questions for My Care Team

Bring this page to visits. Small questions are worth writing down, especially when treatment days start to run together.

Symptoms or side effects I want to mention

Medication, refill, or product questions

Eating, drinking, bowel, bladder, skin, sleep, or activity questions

Logistics: appointments, transportation, work, family, forms

One thing I keep forgetting to ask
