



# Smoking Cessation in Oncology

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- No conflicts to report



# Objectives

At the end of this discussion participants will be able to confidently:

- ask patients about smoking status
- list the benefits of quitting for cancer patients
- identify three first line medications to assist in cessation



# Smoking

- Here we will use the terms smoking and using tobacco.
- Using commercial tobacco or other tobacco products have health consequences
- Cultural use of tobacco is not the same as commercial tobacco use.

# Barriers to Addressing Tobacco Use – Patients

- Myths:
  - “I’ve got too much on my plate right now”
  - “This isn’t the priority now”
  - “I’m far too stressed”
- Stress and smoking are cyclical. People believe smoking relieves stress, but in fact it contributes to their stress. People who smoke have more stress than those who don’t.<sup>1</sup>



# Barriers to Addressing Tobacco Use – Health Care Providers

- Myths:
  - “It’s too late now”
  - “This is a stressful time for them”
  - “Just let them have this one pleasure”
- Some providers may feel this is “not the time”. However, when patients are not told about quitting, message becomes “It’s ok to smoke”.





# Case

- Mr. S. is newly diagnosed with lung cancer. He just received news of his biopsy results and is feeling overwhelmed. He is told he will be meeting with medical and radiation oncology at CancerCare to discuss further plans for care.
  - A) Ask about tobacco use
  - B) Don't ask, he's too overwhelmed today

# Teachable Moment

- Diagnosis can be ‘window of opportunity’ for healthcare providers to engage patients in smoking cessation.<sup>3</sup>
- Important to take opportunities to motivate patients to quit smoking; they are often interested in quitting after diagnosis.<sup>3</sup>
- Evidence: Benefits of intervening and assisting in a patient’s quitting process as early as possible.<sup>3</sup>

“...The risk of dying could be lowered by 30-40% by quitting smoking at the time of diagnosis.”<sup>4</sup>



# Ask about Tobacco use

- If you are using a **COMPASS** in your clinic, the question about smoking is asked there, and you can speak to the answer provided
  - If they say they have quit, inquire about the length of time, reassure them it is important to stay diligent and not restart
  - If they are using tobacco, ask if they are interested in making a change. Discuss the benefits.

**Refer to the smoking cessation program!**

# Why is Smoking Cessation Important?

## 1) Exploring Suspicion of Cancer

- Cessation is **something that patients can take control of** while waiting for tests, biopsies and appointments.
- **Biopsies can be complicated by continuing to smoke.**



“For some cancer diagnoses, the benefit of smoking cessation may be equal to, or even exceed, the value of state-of-the-art cancer therapies.”<sup>4</sup>

# Why is Smoking Cessation Important?

## 2) Surgical Interventions

- Some surgeons require patients to quit tobacco use prior to surgical interventions.
- Smoking is associated with **increased risk of surgical complications** such as:
  - Post-operative complications
  - Pneumonia
  - Longer hospital stays
  - Increased hospital death



# Why is Smoking Cessation Important?

## 2) Surgical Interventions

- Smoking, in comparison to never smoking:
  - Increased risk of hospital mortality (1.5% vs. 0.39%).
  - Increased risk of pulmonary complications (6.9% vs. 2.6%).<sup>10</sup>
- After pulmonary resection for lung cancer:
  - Risk declines with a longer interval of smoking cessation.
  - No optimal interval of smoking cessation was identified.
- Bottom line: **Patients should be counseled to stop smoking irrespective of surgical timing and advised that their operative risks can be favorably modified by cessation.**

# Why is Smoking Cessation Important?

## 3) Radiation Therapy

- **Side effects from RT are more significant for those who smoke.**
- **Smoking seen as one of the greatest predictors of major complications during RT:<sup>11</sup>**
  - Mucositis can last nearly twice as long for smokers compared to those who do not smoke while on treatment.<sup>12</sup>
  - Increased risks of bladder and rectal complications are seen in those who continue to smoke.<sup>11</sup>
  - Esophageal complications and infections are seen less in those who quit smoking while undergoing RT.<sup>13</sup>



# Why is Smoking Cessation Important?

## 3) Radiation Therapy

- There is an increased need for hospitalization while undergoing RT in those who continue to smoke.<sup>14</sup>
- In prostate cancer patients who received RT to the pelvis; current smokers had higher risk of developing *long-lasting* symptoms from the bowel and anal-sphincter region.<sup>15</sup>
- **Patients who smoke have decreased response to RT:**
  - Increased treatment interruption.
  - Higher rate of complications.
- **Decreased quality of life during and after RT.**<sup>14</sup>

# Why is Smoking Cessation Important?

## 4) Systemic Therapy

- **Smoking is a negative predictor in response to chemotherapy in lung cancer patients.**<sup>16</sup>
- Continued smoking is associated with **dose delays and reductions.**<sup>17</sup>
- Circulating tobacco smoke **can impact the metabolism of cancer drugs:**
  - Smoking lowers exposure to irinotecan and increases treatment-induced neutropenia → potential risk of treatment failure.
  - Erlotinib concentration can be as little as half of that of non-smokers.<sup>18</sup>
- Decreased drug levels may **reduce effectiveness of chemotherapy.**

# Why is Smoking Cessation Important?

## 5) Recurrence, Secondary Cancers

- **Patients who quit smoking are less likely to experience relapse or recurrence of their cancer than those who continue to smoke.**
  - In prostate cancer, after prostatectomy, recurrence rates were 14.8% in those who had quit, compared to 34.3% in those who continued to smoke (patients were followed seven years post-op).<sup>19</sup>
  - In bladder cancer, recurrence-free survival rates were 70% in those that had quit, compared to 45% in those who continued to smoke (at three year follow-up).<sup>20</sup>



# Why is Smoking Cessation Important?

## 5) Recurrence, Secondary Cancers

Group	Group definition	Rate of developing a second primary tumour
Current smokers	Patients who continued to smoke at the time of randomization	22%
Recent quitters	Patients who quit smoking less than 12 months before randomization	14.5%
Former smokers	Patients who quit smoking more than 12 months before randomization	13.2%
Never smokers	Patients who have smoked less than 100 cigarettes or 5 packs in their lifetime	8.8%

# Why is Smoking Cessation Important?

## 6) Survival, Quality of Life

- For patients being treated for cancer, quitting smoking is associated with longer survival.<sup>8,22</sup>

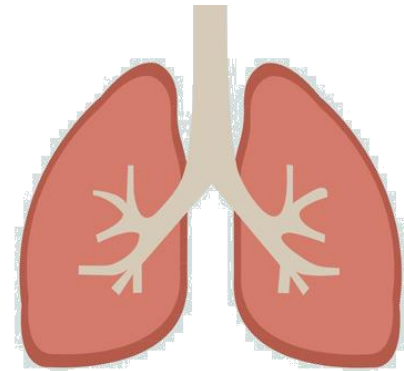
“Younger patients who were diagnosed with late-stage cancer and who quit smoking more than 12 months before diagnosis experienced a significantly decreased risk of dying...”<sup>22</sup>

# Why is Smoking Cessation Important?

## 6) Survival, Quality of Life

### Lung cancer survival

- Early stage non-small cell lung cancer (NSCLC); association between improved survival and time since cessation.<sup>23</sup>
  - 5-year survival rates:
    - 50% for current smokers
    - 76% for never smokers
  - Improving survival correlating to longer time quit.
- Limited stage small cell lung cancer; continued smoking during chemotherapy and RT → poorer survival compared to those who quit (13.6 vs 18 months).<sup>24</sup>

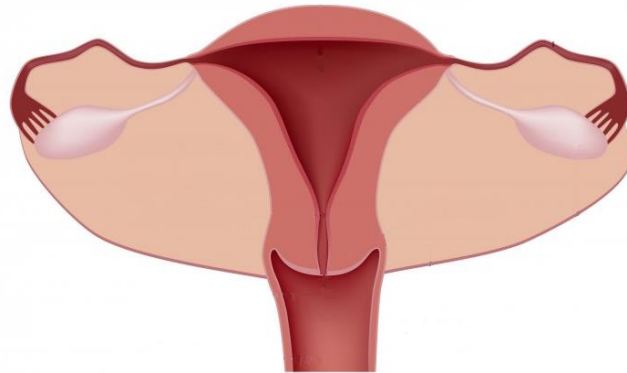


# Why is Smoking Cessation Important?

## 6) Survival, Quality of Life

### Gynecological cancer survival

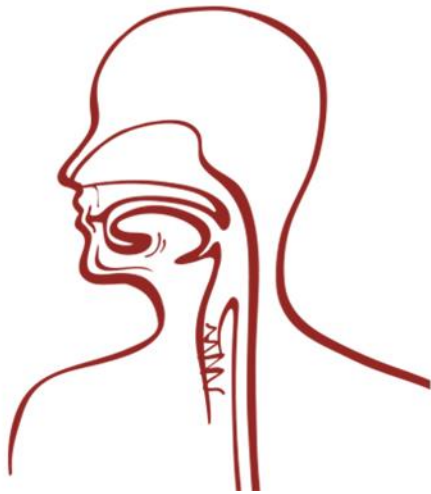
- Smoking predicts worse overall survival for those treated with chemo/RT for cervical cancer.<sup>25</sup>
- Ovarian cancer; for every 5 years since quitting smoking → 11% decrease in risk of ovarian cancer death.<sup>26</sup>



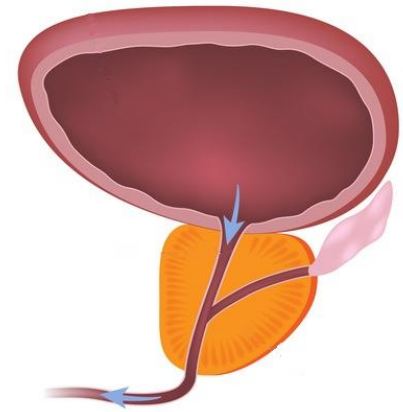
# Why is Smoking Cessation Important?

## 6) Survival, Quality of Life

Prostate cancer patients who are abstinent from smoking for 10 years or longer, have a similar mortality rates to that of non-smokers.<sup>27</sup>



Smoking impacts head and neck cancer survival



# Why is Smoking Cessation Important?

## 6) Palliative Care

- Even when active cancer treatment is stopped, there is still benefit to quitting tobacco use:
  - Quality of life is improved.
  - Symptoms are reduced.
  - Safety for patients on oxygen.
- Indirect positive effects; motivates family members to quit smoking and improve their own health.<sup>31</sup>



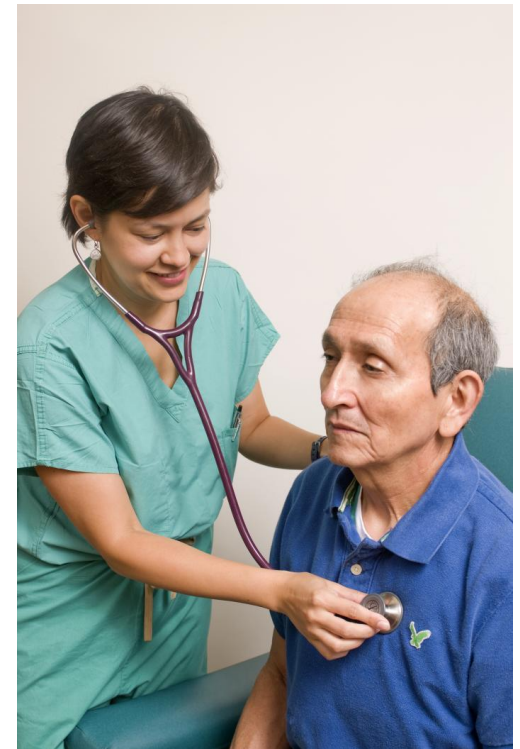
# Preventing Withdrawal During Treatment

- Just as inpatients may be offered NRT during hospital stay – **consider the length of time patient is in treatment facility** (e.g. chemo, RT, tests etc) and unable to smoke.
- Some patients will require NRT when they are in for their cancer treatments to assist with withdrawal symptoms



# Assess

- How we speak to patients about smoking makes a difference in their understanding of smoking's impact upon their treatment.
  - E.g. Patient who was referred by surgeon, however, patient felt that they had not specifically been told that they needed to quit.





# Behavioural Interventions/Support

- Can be provided by **any health care provider** knowledgeable in smoking cessation.
- Can be brief.

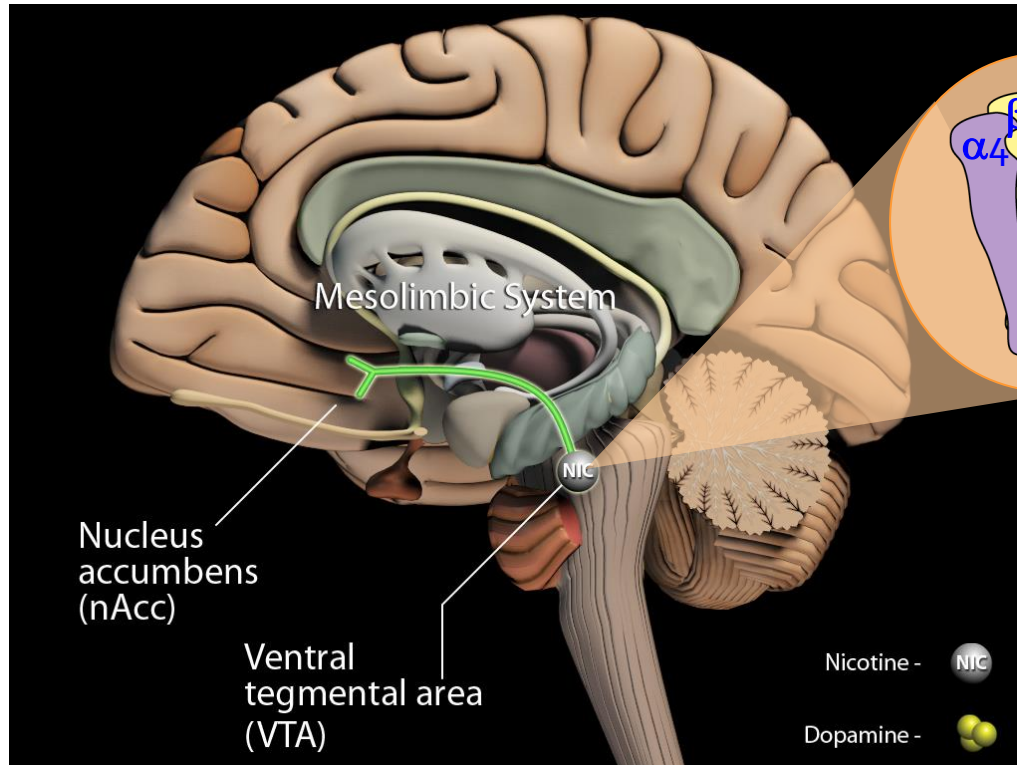
Mr. S. reports he is using tobacco, he smokes “about a pack” per day. Where do we go next?

- a. Advise him to quit, educating him on the benefits
- b. Refer him to the smoking cessation program at CCMB for support, assessment and pharmacology
- c. All of the above

# Pharmacology in Cessation

- Three first line options:
  - Nicotine Replacement Therapy (NRT)
  - Varenicline (Champix<sup>®</sup>)
  - Bupropion (Zyban<sup>®</sup>)

# Mechanism of Action of Nicotine in the Central Nervous System








- Nicotine binds preferentially to nicotinic acetylcholine (nACh) receptors in the central nervous system; the primary is the  $\alpha_4\beta_2$  nACh receptor in the Ventral Tegmental Area (VTA).
- After nicotine binds to the  $\alpha_4\beta_2$  nACh receptor in the VTA, it results in a release of dopamine in the Nucleus Accumbens (nAcc), which is believed to be linked to reward.

# Why Choose NRT?

- Many people prefer to try NRT as they don't see it as a "drug".
  - Don't want to take more pills.
  - They are already getting nicotine so not a new medication.
- Use long-acting (patch) along with short-acting for breakthrough cravings.
- Reduce-to-quit method: use short-acting alone.

# Advising Patients: NRT

	Dose of product	Determining dose	Duration	Instructions for use	Notes on use
Patches 	21mg/24h, 14mg/24h, and 7mg/24h	Choose dose based on amount smoked per day (1 cig = 1-2 mg patch)	Up to 6 mos.		Skin assessment (e.g. skin toxicity from chemo or disease).
Lozenges 	1 mg, 2 mg, and 4 mg	Use as needed, up to 15 per day		Suck and park method: hold lozenge in cheek.	Assess if patient has dry mouth, oral ulcers, radiation reactions (e.g. head and neck patients).
Inhaler 	Up to 4 mg per cartridge (over 20 min of continuous puffing)	Use as needed, up to 12 cartridges per day		Puff and hold air in mouth, don't drag in deep (absorbed through oral mucosa).	Maintains hand-to-mouth habit.
Gum 	2 mg and 4 mg	Use as needed, up to 15 per day		Bite and park method: bite once or twice to release nicotine and then park in cheek.	Assess if patient has dental implants, dentures.
Spray 	1 mg per spray	Use as needed		Spray in mouth, do not swallow.	

# Mechanism of Action: Varenicline (Champix®)

## **ACTIVITY 1: Partial agonist**

Varenicline binds to the nicotinic receptor, to a lesser degree than nicotine.

## **ACTIVITY 2: Antagonist**

Varenicline is bound to the receptor, preventing the binding of nicotine.

- Outcomes:
  - Lessened desire to smoke
  - Minimal cravings
  - Smoking becomes unappealing

# Advising Patients: Varenicline (Champix<sup>®</sup>)

	Dose of product	Determining dose	Duration	Instructions for use	Notes on use
Varenicline	0.5mg and 1mg	0.5mg once daily x 3 days  THEN 0.5mg twice daily x 4 days  THEN 1mg twice daily	12-24 weeks	Cannot be used with NRT.  Quit day is usually day 8-14 of therapy.	Side effects commonly include nausea, dizziness and sleep disturbance/vivid dreams.  Instances of mood disturbance have been reported.

# Mechanism of Action: Bupropion (Zyban®)

- Mechanism is unknown in smoking cessation.
- It is presumed that this action is mediated by a noradrenergic and/or dopaminergic mechanism.



# Advising Patients re: Bupropion (Zyban®)

	Dose of product	Determining dose	Duration	Instructions for use	Notes on use
Bupropion	150 mg	150 mg per day x 3 days THEN  150 mg twice per day	12-24 weeks	Can be used with NRT.  Quit day is set 1-2 weeks after therapy starts.	Decreases withdrawal symptoms.  Side effects commonly include shakiness, dry mouth, difficulty sleeping.

# Oncology-Specific Drug Interactions

Assess drug interactions:

- Bupropion is a CYP2D6 inhibitor
  - **Bupropion and tamoxifen:** bupropion may inhibit CYP2D6 metabolism of tamoxifen, to the active metabolite. *This may decrease the effectiveness of tamoxifen.*
  - **Bupropion and ondansetron:** bupropion may inhibit the metabolism of ondansetron, resulting in increased levels of ondansetron. *Consider length of treatment and dose of ondansetron.*



# Health Canada

- E-cigarettes have not been approved as cessation aids
- None of the companies have submitted to Health Canada for approval as cessation aids
- No companies have applied for approval as a cessation aid to the US Food and Drug Administration at this time
- Recent study has shown a lung response similar to that seen in those who smoke

# Smoking Cessation Program

- How to refer?
  - Send a referral on behalf of the patient. Send to the CCMB general referral fax line
  - Call the toll free line on the patient or family's behalf **1-888-775-9899**
  - Provide a card so the patient or family can call on their own when they are ready

# References

Clinical Practice Guidelines on Smoking Cessation, CancerCare Manitoba

Compendium of Pharmaceuticals and Specialties, 2016, Canadian Pharmaceutical Association

E-Cigarette Use Causes a Unique Innate Immune Response in the Lung Involving Increased Neutrophilic Activation and Altered Mucin Secretion Boris Reidel  
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