Smoking Cessation in the Thoracic Surgery Patient

Hilary W. Crittenden, MSN, RN, FNP-C, CTTS
Division of Thoracic Surgery
Duke University Health System
Durham, North Carolina
Disclosures:

I have no conflicts of interest and no disclosures.
Objectives

• Identify the link between tobacco abuse and lung cancer
• Describe the correlation between smoking and post-operative complications in the thoracic surgery patient
• Discuss the benefits of pre-operative smoking cessation counseling in the thoracic surgical oncology clinic setting
• Review the current FDA-approved medications for smoking cessation and their guidelines for use
Case study: 75 yo Philip Morris

- Biopsy-proven NSCLC
- >50 pack years
- No desire to quit when we first meet
US Statistics

- #1 cause of preventable morbidity and mortality in the US
- 15.1% percent of US population smokes
- Drops 0.58% per year
- 42.7% made an attempt in the past year
Smoking is the #1 risk factor for lung cancer

- Lung cancer is the leading cancer killer in the U.S. and worldwide.
- Globally, smoking is directly responsible for over 80% of lung cancer deaths.
- Annually, lung cancer causes more than 1.6 million deaths: more than breast, colon and prostate cancers combined.
- More than 890,000 deaths result from exposure to second-hand smoke worldwide.

IASLC Lung Cancer Fact Sheet, 2017
Smoking after a lung cancer diagnosis:

• Continued tobacco use compromises the effectiveness and increases the complication rates of three primary cancer treatments: surgery, chemotherapy and radiotherapy.

• In patients undergoing surgery, continued cigarette smoking is associated with slower wound healing, higher surgical site infection rates and prolonged hospitalization.
Smoking after a lung cancer diagnosis

• Components of tobacco smoke significantly impact clearance and delivery of many cytotoxic agents, resulting in their decreased efficacy and higher toxicity.

• Compared to former smokers and patients who stopped smoking before starting treatment, current smokers have lower response rates to radiation therapy and acerbated radiation side effects, such as oral mucositis, weight loss and fatigue.

Smoking after a lung cancer diagnosis

• Smoking after a cancer diagnosis results in higher risk of developing secondary cancers, poorer general health and increased all cause mortality.

• Overall, patients who continue to smoke after cancer diagnosis almost double their risk of dying, compared to those who quit.

Jassem, J: Smoking after diagnosis of cancer. IASLC presentation 10/2017
Influence of smoking cessation after diagnosis of early stage lung cancer on prognosis: systematic review of observational studies with meta-analysis

A Parsons, research fellow, A Daley, senior lecturer, NIHR career scientist, R Begh, research associate, P Aveyard, clinical reader, NIHR career scientist

ABSTRACT

Objective To systematically review the evidence that smoking cessation after diagnosis of a primary lung tumour affects prognosis.

Design Systematic review with meta-analysis.


Conclusions This review provides preliminary evidence that smoking cessation after diagnosis of early stage lung cancer improves prognostic outcomes. From life table modelling, the estimated number of deaths prevented is larger than would be expected from reduction of cardiorespiratory deaths after smoking cessation, so most of the mortality gain is likely to be due to reduced cancer progression. These findings indicate that offering smoking cessation treatment to patients presenting with early stage lung cancer may be beneficial.
Smoking and increased risk of post-operative complications
Post-operative pulmonary complications

Risk factors include:

• Age
• Pulmonary function
• Cardiovascular comorbidities
• Smoking status
• Chronic obstructive pulmonary disease

Musallam et al, JAMA Surgery, 2013
Preoperative smoking associated with increased risk of post-op:

- General morbidity
- Wound complications
- General infections
- Pulmonary complications
- Neurological complications
- Admissions to the intensive care unit

And yet, studies show that……

50-83% of cancer patients continue to smoke after diagnosis

Duffy et al, Community Oncology 2012
Quitting before thoracic surgery

• When is the best time?
• Is there risk in quitting too close to surgery?

Myers et al., JAMA Internal Medicine, 2011
Stopping Smoking Shortly Before Surgery and Postoperative Complications

A Systematic Review and Meta-analysis

Katie Myers, MSc, CPsychol; Peter Hajek, PhD; Charles Hinds, FRCP, FRCA; Hayden McRobbie, MBChB, PhD

Smoking and timing of cessation on postoperative pulmonary complications after curative-intent lung cancer surgery

Authors: Sebastian T. Lugg, Theofano Tikka, Paula J. Agostini, Amy Kerr, Kerry Adams, Maninder S. Kalkat, Richard S. Steyn, Pala B. Rajesh, Ehab Bishay, David R. Thickett and Babu Naidu

Citation: Journal of Cardiothoracic Surgery 2017 12:52
Published on: 19 June 2017
The perioperative period offers a genuine opportunity for smoking cessation.

Preoperative smoking cessation should be routinely recommended independently of the timing of the intervention, even though the benefits increase in proportion with the length of cessation.

We can make a difference!
We can make a difference!

• Smokers cite health care professionals advice to quit as an important motivator for attempting to stop smoking

• *Even brief advice* has been shown to significantly increase the chances that your patient will try to quit and do so successfully

• Studies showed than one quarter of adult smokers reported *never* having received smoking cessation advice from their health care providers

Hughes, J.R. Journal of General Internal Medicine, 2003
Perhaps more than anyone, WE have a *teachable* moment.......  

...*greatest success is achieved among cancer patients who are offered cessation treatments immediately after their diagnosis. The longer the lapse between diagnosis and initiation of a cessation program the lower likelihood of success......*  

Duffy et al, Community Oncology, 2012
People who are struggling with tobacco dependence are bombarded with false, misleading, and ineffective alternatives and sham treatments.
So how do we do this?

I WANT YOU TO QUIT SMOKING
Behavioral therapy:

• Health provider advice and counseling
• Tailored self-help materials
• Telephone counseling
• Smoking cessation clinics
Make it specific to YOUR lung cancer patient

The immediate benefits:
• Improved oxygenation
• Lowered blood pressure
• Improved smell/taste = appetite
• Improved circulation and breathing
• Increased energy
• Improved immune response

Sanderson Cox et al, Journal of Clinical Oncology, 2002
Cataldo et al, Oncology, 2010
The long term benefits:

• Decreased risk of recurrent or secondary tumor
• Increased survival time
• Decreased post-operative complications
• Improved response to chemotherapy and radiation therapy
• Improved quality of life

Sanderson Cox et al, Journal of Clinical Oncology, 2002
Cataldo et al, Oncology, 2010
1-800-Quit-Now

• Quit-lines are effective, evidence-based treatments for smoking cessation
• Quit rates higher in quit-line users for counseling alone and higher still in users who received counseling plus medication
• Cost-effective when compared to other common disease prevention interventions
• Available in all 50 states

USPSTF 2015 Update on Tobacco Cessation in Adults: Behavioral and Pharmacotherapy Interventions
Centers for Disease Control and Prevention Fact Sheet: Quitline FAQs for Health Care Providers, updated 12/2017
Back to our patient........

- Review link between smoking and lung cancer
- Explain benefits of quitting before surgery
- Advise patient to quit now
- Surgery scheduled in three weeks
In addition to counseling...
Pharmacotherapy

FDA approved medications for tobacco dependence:

• Nicotine replacement therapy
  – long and short acting
• Bupropion
• Varenicline
Nicotine Replacement

*Long acting:*
- Patch

*Short acting:*
- Gum
- Lozenge
- Inhaler
- Nasal spray
Nicotine Replacement: adverse effects

Long acting:
• Patch – skin irritation

Short acting:
• Gum – sore jaw/mouth, dyspepsia, hiccough
• Lozenge
• Inhaler – mouth/throat irritation, cough
• Nasal spray - epistaxis
## Nicotine patch: dosing

<table>
<thead>
<tr>
<th>Smoking Rate</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;10 cpd</td>
<td>7-14 mg/d</td>
</tr>
<tr>
<td>10-20 cpd</td>
<td>14-21 mg/d</td>
</tr>
<tr>
<td>21-40 cpd</td>
<td>21-42 mg/d</td>
</tr>
<tr>
<td>&gt;40 cpd</td>
<td>42+ mg/d</td>
</tr>
</tbody>
</table>
Nicotine patch: dosing schedule

• Use the starting dose for 4-6 weeks
• Taper in 7-14 mg steps every 2-6 weeks
• Length of therapy varies based on patient response
• Withdrawal symptoms while tapering are usually mild if they exist at all
• Stay in contact with your patients to assess their response and assist with taper
Nicotine patch: duration of use

• Approved for 3 months
• Longer is better

“I’m prescribing a patch to help you quit smoking. Wear it over your mouth.”

Schnoll et al Annals of Internal Medicine, 2010
Immediate-release NRT:

Nicotine gum, lozenge, and inhaler

- Absorbed through the buccal mucosa
- Affected by pH (avoid soft drinks)
- Technique is important with gum/lozenges
- Peak absorption in 15-20 minutes
- No prescription necessary for gum and lozenges
Immediate-release NRT:

Nicotine inhaler:

• Requires a prescription
• Smokers instructed to puff on the inhaler - "don't inhale into the lungs"
• Recommended use is six to 16 cartridges a day for six to 12 weeks
Immediate-release NRT

Nicotine nasal spray:
• Requires a prescription
• Absorbed through nasal mucosa
• Recommended use is one spray each nostril 1-2 times per hour for ~3-6 months
• Side effects include nasal, sinus and throat irritation, watery eyes, sneezing, and coughing

USPSTF Treating Tobacco Use and Dependence: Clinical practice Guidelines update 2015
UpToDate Pharmacotherapy for smoking cessation in adults: Summary and Recommendations
Combination NRT:

• Preferred over long acting or immediate release alone
• Patients use nicotine replacement patches for steady state absorption and immediate release medications for cravings
• Longer duration (>8-10 weeks) of therapy may lead to improved smoking cessation rates

Cahill et al, JAMA, 2014
Bupropion

• Also known as Wellbutrin and Zyban, extended release form is bupropion is approved for smoking cessation
• Studies found that compared to placebo, bupropiopon increased the likelihood of smoking cessation.
• OK to take with SSRI's (often encountered)
Bupropion: dosing

• Set target quit date one week from start of medication
• Start with 150 mg daily for 3 days and increase to 150 mg b.i.d. with at least 8 hours between doses
• Evening dose before 6 pm to avoid insomnia
• Treat for at least 8-12 weeks
• Severe liver disease requires dose adjustment
Bupropion: side effects

- Headache
- Insomnia
- Dry mouth
- Anxiety/agitation
- Decreased seizure threshold
Varenicline

• Targets the nicotinic acetylcholine receptor in a unique fashion
• As an agonist it stimulates the receptor to decrease cravings and withdrawal symptoms
• As an antagonist, it blocks the receptor to decrease the reinforcement associated with smoking

USPSTF Treating Tobacco Use and Dependence: Clinical practice Guidelines update 2015
UpToDate Pharmacotherapy for smoking cessation in adults: Summary and Recommendations
Varenicline: dosing

• Smokers instructed to quit one week after starting varenicline to achieve stable blood levels
• Take 0.5 mg once daily for three days, then 0.5 mg twice daily for four days, followed by 1 mg twice daily for the remainder of a 12 week course
Varenicline: dosing (continued)

• Prescribe a starter pack (first month of upward titrated doses) as well as two months of maintenance dosing for a 12 week course
• Patients who have successfully quit at 12 weeks can be continued on varenicline for an additional 12 weeks
• Excreted by the kidney; requires dose reduction in smokers with moderate renal insufficiency

Tonstad et al, JAMA, 2006
Varenicline: side effects

• Nausea
• Insomnia
• Abnormal or "vivid" dreams
• Headache
• Other GI effects
Varenicline: warning

WARNING: SERIOUS PSYCHIATRIC EVENTS
See full prescribing information for complete warning.

- Serious and life-threatening psychiatric events have been reported in patients taking
  CHANTIX. (See section 6.2)
- Advise patients and caregivers that the patient should stop taking
  CHANTIX and contact a healthcare provider immediately if agitation,
  hostility, depressed mood, or changes in behavior or thinking that are
  not typical for the patient are noted, or if the patient develops
  suicidal ideation or suicidal behavior while taking CHANTIX, or
  shortly after discontinuing CHANTIX. (See section 6.2)
- Weigh the risks of CHANTIX against benefits of its use. CHANTIX
  has been demonstrated to increase the likelihood of abstaining from
  smoking as long as one year compared to treatment with placebo.
  The health benefits of quitting smoking are immediate and
  substantial. (See section 6.1)
Which tobacco cessation treatment is best?
Which is best?

**Pharmacological Treatments for Smoking Cessation**

Kate Cahill, BA¹,²; Sarah Stevens, MSc¹; Tim Lancaster, MBBS, FRCGP¹,²

[+] Author Affiliations


**ABSTRACT**

**Clinical Question** Among the 3 first-line smoking cessation treatments (nicotine replacement therapy [NRT], bupropion, and varenicline), which is most effective in helping people who smoke achieve and maintain abstinence from smoking for at least 6 months, and what serious adverse events are associated with each?

**Bottom Line** Higher rates of smoking cessation were associated with NRT (17.6%) and bupropion (19.1%) compared with placebo (10.6%). Varenicline (27.6%) and combination NRT (31.5%) (eg, patch plus inhaler) were most effective for achieving smoking cessation. None of the therapies was associated with an increased rate of serious adverse events.
And research is ongoing...

Effects of Nicotine Patch vs Varenicline vs Combination Nicotine Replacement Therapy on Smoking Cessation at 26 Weeks
A Randomized Clinical Trial

Timothy B. Baker, PhD; Megan E. Piper, PhD; James H. Stein, MD; Stevens S. Smith, PhD; Daniel M. Bolt, PhD; David L. Fraser, MS; Michael C. Fiore, MD, MPH, MBA

<table>
<thead>
<tr>
<th>CHARLIE TABLE</th>
<th>Relative Risk</th>
<th>Abstinence Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varenicline</td>
<td>RR = 2.43</td>
<td>24%</td>
</tr>
<tr>
<td>Patch + Immediate Release Nicotine</td>
<td>RR = 2.33</td>
<td>23%</td>
</tr>
<tr>
<td>Nicotine Patch</td>
<td>RR = 1.75</td>
<td>18%</td>
</tr>
<tr>
<td>Nicotine Gum</td>
<td>RR = 1.59</td>
<td>16%</td>
</tr>
<tr>
<td>Nicotine Lozenge</td>
<td>RR = 1.59</td>
<td>16%</td>
</tr>
<tr>
<td>Nicotine Inhaler</td>
<td>RR = 1.82</td>
<td>18%</td>
</tr>
<tr>
<td>Nicotine Nasal Spray</td>
<td>RR = 1.93</td>
<td>19%</td>
</tr>
<tr>
<td>Bupropion</td>
<td>RR = 1.71</td>
<td>17%</td>
</tr>
<tr>
<td>Nortriptyline</td>
<td>RR = 1.71</td>
<td>17%</td>
</tr>
<tr>
<td>Clonidine</td>
<td>RR = 1.74</td>
<td>17%</td>
</tr>
</tbody>
</table>

Davis, J. Perioperative Smoking Cessation: Evidence Based Perioperative Medicine 2018
Electronic cigarettes for smoking cessation?
What happened to our patient?
Success for Mr. Morris…..

• Doing well on varenicline and nicotine lozenges
• Quit smoking when we saw him initially
• Referred to the Smoking Cessation Clinic: appt to coincide with post-op visit
• Tobacco-free one year later
• Wife quit smoking too!
Remember...

QUITTING SMOKING IS A MARATHON, NOT A SPRINT.

You can quit smoking. For free help, call 1-800-QUIT-NOW.
In summary...

• Cigarette smoking is responsible for >80% of lung cancer deaths and puts our thoracic surgery patients at increased risk for post-op complications

• It is our responsibility to ask every patient if they smoke, advise them to quit, and help them achieve lasting tobacco cessation

• We have the unique opportunity to provide help to our patients when they need it most
Thank you

The real reason dinosaurs became extinct
References


2. Centers for Disease Control and Prevention Fact Sheet: Current Cigarette Smoking Among Adults in the United States. [www.cdc.gov/tobacco/data_statistics/fact_sheets/adult_data/cig_smoking/]


4. IASLC Lung Cancer Fact Sheet, 2017


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18. Centers for Disease Control and Prevention Fact Sheet: Quitline FAQs for Health Care Providers, updated 12/2017

19. UpToDate Pharmacotherapy for smoking cessation in adults: Summary and Recommendations


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