

# The clinical case for smoking cessation for oncology patients

## What is the relationship between smoking and cancer?

Smoking is the single largest preventable causer of cancer.<sup>1-3</sup> It is estimated that tobacco smoke is responsible for 15% of all cancers in the UK.<sup>2</sup> Of the 5,000+ chemicals that are known to make up cigarette smoke, at least 40 are carcinogenic.<sup>2</sup>

Cigarette smoking has been causally linked with the development of an ever-increasing list of cancers, including: lung, oral cavity, nasal cavities and nasal sinuses, larynx, pharynx, oesophagus, pancreas, kidney, liver, stomach, colorectum, bladder, renal pelvis, ureter, ovary, cervix, and myeloid leukemia.<sup>1-5</sup> An estimated 85% of lung cancer in the UK are caused by smoking, which is the leading cause of cancer related mortality in the UK.<sup>2</sup> There is a growing body of evidence regarding the causal association between tobacco use and breast cancer.<sup>4-7</sup> Emerging evidence has also linked smoking with an increased risk of Hodgkin lymphoma, prostate cancer, endometrial cancer, and cancer of the vagina and vulva.<sup>4,5</sup>

### Why intervene in secondary care?

#### Hospitalisation offers an opportune time to encourage patients to stop smoking for five main reasons.

- Firstly, this time is often a 'teachable moment' where patients are more receptive to intervention and are more motivated to quit.
- Secondly, abstaining from smoking at this time can lead to significant health benefits.
- Thirdly, the hospital's no smoking environment creates an external force to support abstinence.
- Fourthly, patients are ideally placed to be given information about treatment options, supported through withdrawal and signposted to specialist services.
- Finally, smoking cessation interventions are highly cost-effective and result in direct cost-savings to the NHS.

There is a growing body of evidence that continued smoking following a diagnosis of cancer promotes tumour progression, increases risk of additional primary and secondary cancers, and reduces the effectiveness of cancer treatment, and reduces survival.<sup>1,8-10</sup> For patients undergoing surgery tobacco use is associated with a 40% increase in surgical complications, worsened wound healing and risk of infection.<sup>11</sup>

Although direct evidence is lacking for some smoking-related cancers, research supports that smoking increases cancer risk by altering DNA and likely this occurs by increasing the somatic mutation load.<sup>12</sup> There is a dose-response relationship between the number of cigarettes smoked and risk of cancer, however even smoking a few cigarettes per day has been shown to affect cancer progression and treatment outcomes.<sup>1,4</sup>

### What are the health benefits of quitting for oncology patients?

Although some cancer patients present with advanced stage disease, many patients are eligible for curative treatment and may benefit from smoking cessation. In a number of histological types of cancer, smoking cessation has been associated with:<sup>1,10</sup>

- **increased treatment response,**
- **decreased risk in complications,**
- **increased quality of life,**
- **reduction in risk of disease progression, and**
- **reduced mortality**

Additionally, smoking cessation will benefit a patient's long-term health by reducing the risk of developing other disease.<sup>1,13</sup> Some of these benefits may be derived from the elimination of the acute effects of smoking on the body (see next page).

### Main acute effects of smoking on the body (estimated time of recovery, if known)

- Increase in sympathetic tone leading to an increase in blood pressure, heart rate and peripheral vasoconstriction leading to an increased demand for oxygen and cardiac function<sup>14</sup> **(24–48 hours)**
- Formation of carboxyhaemoglobin leading to a reduction in oxygen delivery to the tissues<sup>15</sup> **(8–24 hours)**
- Formation of carboxymyoglobin leading to a reduction in oxygen storage in the muscles<sup>16</sup> **(8–24 hours)**
- Increase in red blood cell production, which leads to an increase in blood viscosity, a decrease in tissue perfusion, a decrease in oxygen delivery to the tissues and potentiation of thrombotic process<sup>17,18</sup>
- Hypersecretion of mucus, narrowing of the small airways, decrease in ciliary function and change in mucus rheology leading to a decrease in mucociliary transport<sup>17,18</sup> **(12–72 hours)**
- Changes in functioning of a range of immune cells (pro- and anti-inflammatory cytokines, white blood cells, immunoglobulins) which lead to decreased immunity and are associated with atherosclerosis<sup>17,18</sup> **(1 week–2 months)**
- Induction of hepatic enzymes which increases drug metabolism through both pharmacokinetic and pharmacodynamic mechanisms<sup>19</sup> **(6–8 weeks)**

### Lung cancer

- Smoking cessation within 1 month before lung cancer surgery has been associated with either no increase or a decreased risk in major pulmonary complications compared with continuing smokers.<sup>20</sup> In addition to the reduction in pulmonary complications, smoking cessation before surgery can improve other outcomes (see clinical case for quitting for surgical patients).
- Smoking cessation after diagnosis has been associated with increased overall survival and a decreased rate of recurrence in non-small cell lung cancer (NSCLC) compared with continuing smokers.<sup>21–29</sup> However, not all studies have shown consistent results.<sup>30</sup>
- Smoking cessation after diagnosis has been associated with increased overall survival and a decreased rate of development of a second primary or recurrence in small cell lung cancer (SCLC) compared with continuing smokers.<sup>21</sup>

### Head and neck cancers

- Smoking cessation before the initiation of radiation therapy is associated with an increased rate of complete response to treatment compared to those who continue to smoke through treatment.<sup>31</sup>
- Smoking cessation after diagnosis has been associated with decreased risk of development of a second primary tumour.<sup>26,27,32</sup>
- Smoking cessation after diagnosis has been associated with an increased survival rate.<sup>31-33</sup>
- Smoking cessation after a diagnosis has been associated with increased quality of life scores on the EORTC C30, H&N35 and SF-36V questionnaires.<sup>34,35</sup>

### Bladder cancer

- There is preliminary evidence that smoking cessation after the diagnosis of bladder cancer may reduce the risk of the development of a recurrence and of overall mortality.<sup>9,36-38</sup>

### What do we know about how to help cancer patients quit?

Smoking cessation for patients with cancer presents added complications as patients are contending with a life-threatening illness, have a prolonged treatment period and have significantly elevated levels of psychological distress which has been associated with decreased quit success.<sup>10,39-41</sup> Moreover, many patients may not be aware of the benefits of stopping smoking following their cancer diagnosis.<sup>39-41</sup>

Smoking cessation interventions have been proven effective for hospitalised patients regardless of admitting diagnosis<sup>42</sup> and specifically for oncology patients.<sup>43,44</sup>

Smoking cessation interventions for hospitalised patients increase the rate of long-term quitting if they include:<sup>42</sup>

- **in-hospital behavioural support,**
- **stop smoking pharmacotherapy, and**
- **follow-up for at least 1 month after discharge**

Both inpatient and outpatient cancer treatment settings should introduce **systems to address tobacco use to ensure best practice intervention** is received to support this high-risk patient population with quitting.<sup>45</sup>

### Best practices for managing tobacco withdrawal in the inpatient setting

Most regular smokers will experience tobacco withdrawal symptoms within hours of their last cigarette and can range from mild to severe.<sup>46</sup> Withdrawal symptoms include aggression and hostility and can affect the care of the patient. Recognising and managing withdrawal among hospitalised patients who smoke should be a priority. Providing nicotine replacement therapy (NRT) or varenicline to a patient will ease tobacco withdrawal symptoms and can also support long-term quitting. A combination of the patch (NRT patch can take 20–40 minutes to reach therapeutic dose) with a short-acting oral NRT product (e.g. gum, inhaler, spray) is a recommended evidence-based practice.<sup>45,47</sup>

#### Tobacco withdrawal symptoms include:<sup>46</sup>

- Urges to smoke or cravings
- Restlessness or difficulty concentrating
- Irritability, aggression, anxiety, crying, sadness or depression
- Difficulty sleeping or sleeping disturbances
- Increased appetite and weight gain
- Coughing
- Mouth ulcers
- Constipation
- Light headedness

### Vaping

E-cigarettes provide nicotine without combustion and are popular among UK smokers as an alternative to smoking. While electronic cigarettes are not risk-free, Public Health England estimates they are 95% safer than smoking cigarettes.<sup>48</sup> There is also evidence to indicate that e-cigarettes are effective in helping patients stop smoking.<sup>49</sup> Evidence on safety and the role vaping plays in supporting quitting is reviewed regularly. Policies related to the use of electronic cigarettes in inpatient settings will vary by trust and organisation.

## Very Brief Advice on Smoking

### How to approach smoking cessation with patients

**The NHS Long Term Plan has committed that all people admitted to hospital who smoke will be offered NHS-funded tobacco treatment services by 2023/24.<sup>50</sup>**

NICE outlines a care pathway for supporting smoking cessation that can be adopted for oncology patients. In essence, the care pathway incorporates a very brief intervention using the 3As:<sup>45,51</sup>

#### ASK and record smoking status

#### ADVISE the patient:

- the best way of quitting is with a combination of support and stop smoking medication
- support with stopping smoking and/or managing any tobacco withdrawal symptoms (temporary abstinence) is available
- of the personal health benefits of stopping smoking to treatment success and cancer outcomes

#### ACT on the patient's response:

- prescribe NRT to manage withdrawal symptoms
- monitor withdrawal and adjust pharmacotherapy accordingly
- refer to specialised stop smoking support (hospital-based, local stop smoking service)

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