Smoking and Surgery

April 2023

Introduction

Smoking is the single biggest cause of premature and preventable death in the UK. It is responsible for 75,000 deaths every year in England.[1] In addition to the general health risks associated with smoking, research has shown that smokers are more likely to suffer a range of complications before, during and after surgery.[2] Quitting smoking improves surgical outcomes through reducing risk and complications. Supporting more smokers to quit ahead of surgery will reduce the burden on the NHS and as such, provide cost savings. At a time of acute pressure on the NHS surgical capacity, reducing smoking among patients can make a major contribution to addressing immediate challenges.

The NHS Long Term Plan was published in 2019. The plan laid out a clear focus on prevention as a means to address inequality and manage demand for NHS treatment with investment to provide tobacco dependence treatment services within acute inpatient care, mental health and maternity services.[3] As a result of these commitments there are now significant resources being invested into addressing smoking in secondary care creating an infrastructure with the scope for expansion to support outpatients such as smokers on surgical waiting lists.

This briefing has been produced jointly by ASH and the Royal College of Surgeons of Edinburgh and has been designed for health professionals and commissioners, to provide clear advice and examples of good practice in relation to smoking and surgery.

THE 1 MINUTE READ

- Smokers who do not quit before surgery are at significantly higher risk of many adverse outcomes including death
- Excess complications caused by smoking are creating additional burdens on the NHS
- Upcoming surgery can act as an important, 'teachable moment' in a smoker's life, facilitating intervention
- Evidence-based interventions have been developed that help people to stop or reduce smoking before surgery
- Increased investment in hospital-based treatment for tobacco dependence creates opportunity to expand support to those on surgical waiting lists – improving surgical outcomes and helping to address health inequalities
- Significant reductions in smokers undergoing surgery can be achieved if smokers are given evidence-based 'Very Brief Advice' with referral to expert support to stop or abstain

RISKS ASSOCIATED WITH SMOKING AND SURGERY

There is strong evidence of greater risks and worse surgical outcomes when a patient continues to smoke.[4] The risks associated with smoking mean that it is not always safe for surgery to take place when a patient continues to smoke and, as a result, some surgeons will not carry out procedures until a patient is able to abstain from smoking.[5] Any decision to delay surgery due to smoking should be done on the basis of individual clinical risk not as a blanket rule. Smokers are 38% more likely to die after surgery than non-smokers.[6] Following surgery, the Royal College of Physicians report[7] smokers are **twice** as likely to experience:

- Healing delay
- Postoperative surgical site infection
- Wound complications
- Hernia
- Dental implant failure

Additional research has shown smokers also have higher risks of lung and heart complications,[8] [9] [10] require longer hospital stays and higher drug doses, [11] are more likely to be admitted to an intensive care unit, [11] [12] and have increased risk of emergency re-admission.**Error! Bookmark not defined.**

Smoking has been identified as the most important risk factor for the development of post-operative complications in patients undergoing many surgical interventions including:

- Elective hip and knee replacement[13]
- Foot and ankle surgery[14] [15]
- Shoulder surgery.[16]
- Gum surgery[17]
- Colonic and rectal resection.[18] [19]
- Reconstructive breast surgery and breast cancer surgery [20] [19]

Smokers often need a higher dose of anaesthesia than non-smokers.[21] [22] They have decreased blood oxygenation, leading to decreased oxygen delivery to their tissues[23] and consequently, they are more likely to need oxygen therapy.

SURGERY & BENEFITS OF QUITTING SMOKING

Quitting smoking is the best thing any smoker can do to improve their current and future health. Those who quit smoking approximately 4 weeks before surgery have a reduced risk of postsurgical complications[4], reduced lung, heart and wound-related complications, and reduced average length of stay in hospital.[20] [22]

The optimum length of cessation varies depending on the type of postsurgical outcome assessed (i.e. wound healing or total complications).[4] For smokers who are unable to quit, the Royal College of Anaesthetists advises that smokers should give up smoking for at least several weeks before surgery and certainly not to smoke on the day of an operation.[24]

Effective intervention can reduce smoking rates at the time of surgery by up to half.[25] However, the British Thoracic Society's 2021 national audit of tobacco dependency management in acute care, found two-thirds of inpatient smokers are not offered licensed pharmacotherapy and over half are not provided with very brief advice for tobacco dependency.[26]

Some patients may continue to smoke prior to surgery because they believe it will reduce physical pain or stress[27] [28]. However, research has consistently shown smoking *cessation* to improve pain thresholds and mental health post-surgery.[29] [30]

Quitting smoking after surgery also brings significant benefits. As well as general health benefits, a 20 year follow-up study of smokers who underwent coronary artery bypass graft surgery found that smoking cessation after surgery was an important independent predictor of a lower risk of death and repeat coronary procedures compared with patients who continued smoking.[31]

COST TO THE NHS

The full cost of smoking to surgical care has not been estimated in this country. The Royal College of Physicians has estimated the costs associated with the higher incidence of wound infections among smokers who undergo surgery. Though, they note that this underestimates the full costs due to the limitations of the data. They estimate that smokers cost the NHS £2,506,669 as a result of increased levels of wound infection from 11,662 episodes of care.

ASH has estimated the cost of smoking to the NHS as a whole as being £2.4bn**Error! Bookmark not defined.** with a further £1.2bn in social care costs to local government, and over a million people receiving care from unpaid carers as a result of smoking.[32] Due to the methodology this is also likely to underestimate the costs of smoking to surgical outcomes.

HEALTH INEQUALITIES

Smoking has a strong social gradient and is linked to nearly all indicators of disadvantage.[33] As a result, smoking is responsible for around half the difference in life expectancy between rich and poor.[34] King's Fund analysis has found that the largest pressures on elective care waiting lists are in the most deprived parts of the country and failure to address these differences would likely widen existing health inequalities and differences in treatment outcomes between more and less affluent patients.[35] Addressing smoking on surgical waiting lists can make a contribution to improving outcomes for more disadvantaged groups in the population and narrow the gap in health inequality. Smoking cessation is recognised as a key intervention to reduce health inequalities within the NHS's Core20PLUS5 framework.[36]

PREHABILITATION

The term 'prehabilitation' describes increasing a patient's physical readiness to undergo surgery, thereby reducing the likelihood of surgical complication or negative outcomes.[37] Utilising the waiting period before surgery as a proactive period, or 'teachable moment' for patients can improve surgical outcomes and the long-term health of patients, as well as reducing burdens on the NHS.[38]

Intensive behavioural interventions are effective at reducing postoperative complications in smokers. A Cochrane Review of preoperative smoking interventions found smokers who underwent intensive behavioural interventions before surgery were 60% less likely to experience any postoperative complications and 70% less likely to experience wound infection. There is also some evidence that interventions ahead of surgery can support longer term cessation from smoking.[28]

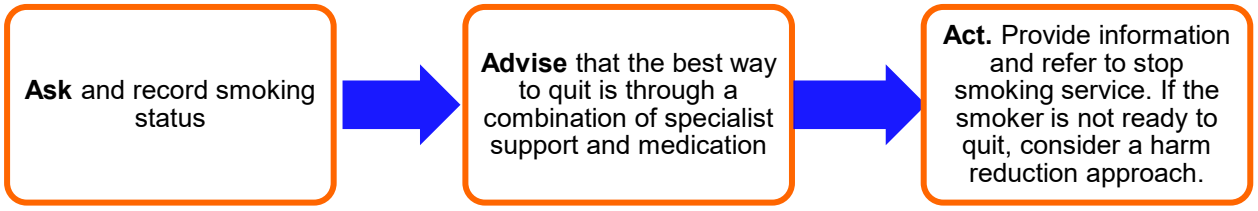
SERVICES TO SUPPORT SMOKERS IN THE NHS

As part of the NHS Long Term Plan a new Tobacco Dependency Treatment service is being rolled out across the NHS.[39] In acute hospitals, this will be provided as bedside support for inpatients to help smokers to abstain from smoking in hospital and encourage them to make a positive attempt to stop. This model is based on the Ottawa Model in Canada. Delivery of the programme is locally determined but the commitment is that it will be fully implemented across the NHS by 2023/24. This programme will create new opportunities to support smokers who need surgery.

HOW SMOKERS CAN BE SUPPORTED TO STOP

Very Brief Advice
The latest stop smoking guidance from NICE [NG209] recommends that people who smoke should be informed of the existing range of interventions which are available to help them stop smoking through the delivery of Very Brief Advice (VBA).[11] Health professionals should also explain how to access them and refer people to stop-smoking support if appropriate.[11] Research has shown that advice from a health professional is the second most common reason patients give for stopping smoking, and the more times patients hear the message, the more likely they are to act on it.[40]

To support the identification and referral of smokers, the National Centre for Smoking Cessation and Training (NCSCT) has developed a training and resource to support staff to deliver the simple 3 components of VBA: Ask, Advise and Act. VBA can be used by all health professionals, and patients who say that they have 'cut down' should still receive a Very Brief Advice intervention at future consultations.



Behavioural support and stop smoking pharmacotherapies
The most effective way to quit smoking is a combination of medication and behavioural support. Nicotine replacement therapy (NRT) (nicotine gum, patches, strips, lozenges, microtabs and mouth and nasal sprays) is available over the counter. NICE advises that behavioural interventions, medicinally licensed products and nicotine-containing e-cigarettes are available to all adults who smoke.[11]

Stop smoking pharmacotherapies should be combined with intensive group or individual behavioural support. Smokers are three times more likely to succeed in quitting with a local stop smoking service than if they try to quit unaided.[41] Patients should be identified and referred to the appropriate service and this will vary according to locality. It could be an inhouse service within the hospital, delivered through pharmacies, GPs, local authority specialist stop smoking service, or the voluntary sector.

E-cigarettes or vapes
E-cigarettes (also know as vapes) are battery-powered devices which deliver nicotine through an aerosol commonly described as vapour. They do not contain tobacco and are not burnt. While smokers are addicted to nicotine it is the tobacco smoke which is harmful. As such, vaping is considered to have far fewer risks than smoking.[42] Indeed, the evidence to date has not identified any major concerns about the use of electronic cigarettes around surgery. A major review of the evidence conducted by King's College London and commissioned by the Office for Health Improvement and Disparities (OHID) looked in detail at the health risks of vaping compared to smoking across a range of conditions

and concluded that vaping substantially reduced risk of harm to health for smokers who switch.[42]

The most common reason smokers give for vaping is to help them quit smoking[43] and a Cochrane review of the evidence found that e-cigarettes were a more effective way for smokers to quit than many medications.[44] NICE guidance [NG209] recommends health professionals provide smokers with information about using e-cigarettes as a quitting aid and for temporary abstinence.[11]

At the time of writing no e-cigarette product licenced as a medicine was available on the market. It is anticipated that at some point in the future products will be available with a licence and hence could be prescribed by health professionals.

For more information see the following documents:

- ASH: The Cochrane Review of electronic cigarettes for smoking cessation, explained
- OHID: Nicotine vaping in England: 2022 evidence update main findings
- NICE Guidelines [NG209]: Tobacco: preventing uptake, promoting quitting and treating dependence

Harm reduction
Whilst smoking cessation is the preferred option, where an individual is unable or unwilling to stop smoking, NICE recommends that a program of harm reduction should be followed to support temporary abstinence or smoking reduction. This should include the provision of behavioural support and nicotine replacement therapy and/or e-cigarettes.[11]

Angela's story

Angela lives in North London and started smoking at the age of 14. After multiple quit attempts throughout her adult life, at the age of 45, she was told she needed major back surgery related to her lifelong osteoarthritis. Having researched her condition, Angela was aware that smoking may have aggravated her arthritis over time and was concerned at the realisation that it may have contributed to her need for an operation. After discussing the impact that her smoking could have on the outcome of her operation with her surgical team, Angela was keen to quit and was referred to her local stop-smoking service. Angela was assigned to a one-to-one specialist near her home in North London, who helped her quit through weekly behavioural support and advice on nicotine-replacement-therapy (NRT). Now three months after a successful operation, Angela has successfully switched to an e-cigarette and feels her arthritis has improved dramatically. She has also used the money she has saved on cigarettes to buy a cross-trainer; she said, **"I just feel like I've made the best decision!"**.

ROLE OF DIFFERENT PROFESSIONALS

1. GENERAL PRACTITIONERS

GPs are normally the first point of contact for patients. As a matter of routine, they should identify smokers and offer smoking cessation interventions.

Evidence suggests undergoing surgery is associated with an increased likelihood of smoking cessation.[1] As such it is important that GPs maximise this opportunity to engage their patients. When delivering VBA, while there is value in connecting the need for smoking cessation to improved surgical outcomes, the most effective way to support smokers to stop is to tell them how to quit and refer them to support.[45]

2. ANAESTHETISTS

Anaesthetists provide general anaesthesia before an operation. More recently, they have also taken on the role of assessing patient wellbeing and fitness before surgery. This involves discussing the risks and benefits of the proposed operation, ensuring that the appropriate care required for a full recovery is in position and providing timely perioperative interventions to reduce the risk of postoperative complications. This discipline has been called perioperative medicine.

Even though preoperative assessment may take place shortly before surgery, it provides a further opportunity to encourage smoking cessation and, as such, improve general health. Helping patients to stop or reduce the amount

they smoke before any form of anaesthetic has become an important goal for anaesthetists.

They can help by:

1. Discussing the merits of stopping smoking before surgery with patients.
2. Involving trained staff to assist in smoking cessation interventions.
3. Referring patients to a specialist smoking cessation service.
4. Involving hospital and community pharmacies in assisting in the process of smoking cessation.
5. Ensuring that smoking cessation is reinforced postoperatively for a long term healthier lifestyle.

3. SURGEONS

The point at which the patient and surgeon agree that surgery should take place should also be seen as a 'teachable moment' where patients are often more receptive to intervention and more motivated to quit. When discussing the risks of any potential procedure the surgeon should outline the reduction in risk associated with smoking cessation. Advice from surgeons to quit smoking is likely to have a big impact on patients and it is important that patients receive consistent messages from all health professionals about smoking.

When this decision has been made, it provides a timeline during which a patient can prepare for their operation. During this period surgeons should work with perioperative medicine teams to increase fitness for surgery and in this case, encourage patients who smoke to quit.

Hasan's story

Hasan currently lives in the East Midlands but started smoking as a teenager in the US. After returning to the UK as a young adult, he had been smoking for three years when he started to experience heart problems at just 25. Shortly after the onset of his symptoms, Hasan was told he needed heart surgery and was informed by his surgical team that his smoking was likely to complicate both his surgery and recovery. It was the shock of this conversation that pushed Hasan to re-evaluate his smoking: **"Sometimes you just need that pendulum of death hanging over you to make you stop and think"**. Hasan decided to quit on his own, and gradually reduced the amount that he was smoking in the lead-up to his surgery. Following a successful quit attempt, surgery and recovery, Hasan has now been smoke free for 5 years, and says he has a better quality of life, can breathe easier, and no longer feels a pressure on his heart: **"At the end of the day, I'm the one who has to live with this body for 'x' amount of years, so keeping it as healthy as I can is really the end goal".**

4. ROLE OF ICBS AND NHS TRUSTS

The impact of the pandemic has placed major pressures on elective surgery. The 22/23 NHS planning guidance placed a major emphasis on reducing backlog while seeking to reduce health inequalities.[46] While the professions above must all play an important role in engaging patients and positively supporting them to connect with quit support, to truly have impact at scale, this must be driven by the system and by Trust leadership.

Future plans to reduce waiting lists and improve surgical outcomes should build in access to high quality smoking cessation support. This will also support NHS objectives to reduce health inequalities and improve prevention support.

Trusts should also view their wider smokefree policies as supporting this agenda and enabling pro-quitting environments to support patients.

WHAT SHOULD SMOKERS EXPECT FROM THE NHS AHEAD OF SURGERY

1. **To be informed of the risks of smoking prior to surgery by all relevant professionals**
2. **To be referred to specialist stop smoking support where this is available**
3. **To be given the opportunity to have behavioural support to help them quit**
4. **To be provided with medication to support a quit attempt or temporary abstinence prior to surgery**

References

When referring to this publication, please cite as: Action on Smoking and Health (ASH). Smoking and Surgery Factsheet, 2023.

[1] NHS Digital. *Statistics on Smoking, England 2020*. https://digital.nhs.uk/data-and-information/publications/statistical/statistics-on-smoking/statistics-on-smoking-england-2020 [Accessed 2 Aug 2022].
[2] Theadom A, Cropley M. Effects of preoperative smoking cessation on the incidence and risk of intraoperative and postoperative complications in adult smokers: a systematic review. *Tobacco Control.* 2006;15: 352–8. http://dx.doi.org/10.1136/tc.2005.015263
[3] Charles A, Ewbank L, McKenna H, Wenzel L. *The NHS long-term plan explained*. https://www.kingsfund.org.uk/publications/nhs-long-term-plan-explained [Accessed 15 November 2022].
[4] Yoong SL, Tursan d'Espaignet E, Wiggers J, St Claire S, Mellin-Olsen J, Grady A et al. *Tobacco and postsurgical outcomes: WHO tobacco knowledge summaries*. World Health Organization. 2020.
[5] Royal College of Surgeons of England. *Smokers and overweight patients: Soft targets for NHS savings?*. Royal College of Surgeons of England. 2016.
[6] Ku J, Wilson JR. Factors Predictive of Operative Outcome. In: Kaiser M, Haid R, Shaffrey C, Fehlings, M (eds.) *Degenerative Cervical Myelopathy and Radiculopathy*. New York: Springer; 2019. p. 167-76.
[7] Royal College of Physicians. *Hiding in plain sight: treating tobacco dependency in the NHS*. Royal College of Physicians. 2018.
[8] Pedersen MG, Eliasen M, Skov-Ettrup LS, Tolstrup JS, Christiansen AH, Mikkelsen SS et al. Preoperative Smoking Status and Postoperative Complications: A Systematic Review and Meta-analysis. *Annals of Surgery.* 2014;259(1): 52-71. https://journals.lww.com/annalsofsurgery/Abstract/2014/01000/Preoperative_Smoking_Status_and_Postoperative.10.aspx
[9] Beaupre LA, Hammal F, Stiegelmar R, Masson E, Finegan B. A community-based pharmacist-led smoking cessation program, before elective total joint replacement surgery, markedly enhances smoking cessation rates. *Tobacco induced diseases.* 2020;18(78): 1-7. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7528266/
[10] Lugg ST, Kerr A, Kadiri S, Budacan AM, Farley A, Perski O, West R, Brown J, Thickett DR, Naidu B. Protocol for a feasibility study of smoking cessation in the surgical pathway before major lung surgery: Project MURRAY. *BMJ Open.* 2020;10: 1-10. https://bmjopen.bmj.com/content/10/11/e036568
[11] National Institute for Health and Care Excellence (NICE), *Tobacco: preventing uptake, promoting quitting and treating dependence [NG209].* 2021. https://www.nice.org.uk/guidance/ng209
[12] Tanaka Y, Yamamoto H, Sato M, Toyooka S, Okada M, Endo S, Sato Y, Suzuki K, Maniwa Y, Fukuchi E, Miyata H, Chida M. Preoperative Cumulative Smoking Dose on Lung Cancer Surgery in a Japanese Nationwide Database. *The Annals of Thoracic Surgery.* 2022;113(1): 237-43. https://www.sciencedirect.com/science/article/pii/S0003497521002812
[13] Lugg ST, Scott A, Parekh D, Naidu B, Thickett DR. Cigarette smoke exposure and alveolar macrophages: Mechanisms for lung disease. *Thorax*. 2022;77: 94-101. https://thorax.bmj.com/content/77/1/94.citation-tools
[14] Heyes G, Weigelt L, Molloy A, Mason L. The influence of smoking on foot and ankle surgery: a review of the literature. *The Foot.* 2021;46: 2-8. https://www.sciencedirect.com/science/article/pii/S0958259220300730
[15] Beahrs TR, Reagan J, Bettin CC, Grear BJ, Murphy GA, Richardson DR. Smoking effects in foot and ankle surgery: an evidence-based review. *Foot & Ankle International.* 2019;40(10): 1226-32. https://journals.sagepub.com/doi/abs/10.1177/1071100719867942
[16] Santiago-Torres J, Flanigan DC, Butler RB, Bishop JY. The Effect of Smoking on Rotator Cuff and Glenoid Labrum Surgery: A Systematic Review. *The American Journal of Sports Medicine.* 2015;43(3): 745-51. https://pubmed.ncbi.nlm.nih.gov/24859982/
[17] Naji A, Edman K, Holmlund A. Influence of smoking on periodontal healing one year after active treatment. *Journal of Clinical Periodontology.* 2020;47(3): 343-50. https://onlinelibrary.wiley.com/doi/abs/10.1111/jcpe.13228
[18] Penna M, Hompes R, Arnold S, Wynn G, Austin R, Warusavitarne J, Moran B, Hanna GB, Mortensen NJ, Tekkis PP. Incidence and risk factors for anastomotic failure in 1594 patients treated by transanal total mesorectal excision: results from the international TaTME registry. *Annals of Surgery.* 2019;269(4): 700-11. https://journals.lww.com/annalsofsurgery/Abstract/2019/04000/Incidence_and_Risk_Factors_for_Anastomotic_Failure.17.aspx
[19] Kim MJ, Rumi S, Oh H, Park JW, Jeong S, Park J. The impact of heavy smoking on anastomotic leakage and stricture after low anterior resection in rectal cancer patients. *World Journal of Surgery.* 2011;35(12): 2806-10. https://link.springer.com/article/10.1007/s00268-011-1286-1
[20] Sørensen LT, Hørby J, Friis E, Pilsgaard B, Jørgensen T. Smoking as a risk factor for wound healing and infection in breast cancer surgery. *European Journal of Surgical Oncology.* 2002;28(8): 815-20. https://pubmed.ncbi.nlm.nih.gov/12477471/
[21] Swerdlow BN. Surgical smoke and the anesthesia provider. *Journal of Anesthesia.* 2020;34: 575-84. https://link.springer.com/article/10.1007/s00540-020-02775-x
[22]Öztürk E, Aydoğan MS, Karaaslan K, Doğan Z, Topuz U. Does smoking increase the anesthetic requirement?. *Turkish Journal of Medical Sciences.* 2019;49(5): 1271-6. https://journals.tubitak.gov.tr/medical/vol49/iss5/2/
[23] Theocharidis V, Katsaros I, Sgouromallis E, Serifis N, Boikou V, Tasigiorgos S, Kokosis G, Economopoulos KP. Current evidence on the role of smoking in plastic surgery elective procedures: a systematic review and meta-analysis. *Journal of Plastic, Reconstructive & Aesthetic Surgery*. 2018;71(5): 624-36. https://www.sciencedirect.com/science/article/pii/S1748681518300238
[24] Royal College of Anaesthetists. *You and your anaesthetic.* 5th Edition. London: Royal College of Anaesthetists; 2020.
[25] Prestwich A, Moore S, Kotze A, Budworth L, Lawton R, Kellar I. How Can Smoking Cessation Be Induced Before Surgery? A Systematic Review and Meta-Analysis of Behavior Change Techniques and Other Intervention Characteristics. *Frontiers in Psychology*. 2021; 8(915): 1-14. https://www.frontiersin.org/articles/10.3389/fpsyg.2017.00915/full
[26] Devani N, Evison M. *National Smoking Cessation Audit 2021: Management of Tobacco Dependency in Acute Care Trusts.* British Thoracic Society. 2021.
[27] Ditre JW, Brandon TH. Pain as a motivator of smoking: Effects of pain induction on smoking urge and behavior. *Journal of Abnormal Psychology.* 2008;117(2), 1-40. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4391507/
[28] Thomsen T, Villebro N, Møller AM. Interventions for preoperative smoking cessation (Review). *Cochrane Database of Systematic Reviews* 2014;13: 344-49. https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD002294.pub4/full
[29] Khan JS, Hah JM, Mackey SC. Effects of smoking on patients with chronic pain: a propensity-weighted analysis on the Collaborative Health Outcomes Information Registry. *Pain.* 2019; 160(10): 2374–79. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6768701/
[30] Taylor GMJ, Lindson N, Farley A, Leinberger-Jabari A, Sawyer K, te Water Naudé R, Theodoulou A, King N, Burke C, Aveyard P. Smoking cessation for improving mental health. *Cochrane Database of Systematic Reviews*. 2021;3: 1-240. https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD013522.pub2/full
[31] van Domburg RT, Meeter K, van Berkel DFM, Veldkamp RF, van Herwerden LA, Bogers AJ. Smoking cessation reduces mortality after coronary artery bypass surgery: a 20 year follow-up study. *Journal of the American College of Cardiology.* 2000; 36 (3): 878-83. https://pubmed.ncbi.nlm.nih.gov/10987614/
[32] Reed H. *The costs of smoking to the social care system and related costs for older people in England: 2021 revision*. Action on Smoking and Health. 2021.

[33] Office for National Statistics. *Likelihood of smoking four times higher in England's most deprived areas than least deprived.* https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/drugusealcoholandsmoking/articles/likelihoodofsmokingfourtimeshigherinenglandsmostdeprivedareasthanleastdeprived/2018-03-14 [Accessed 11 Nov 2022].
[34] Marmot M, Allen J, Goldblatt P, Boyce T, Cneish D, Grady M, Geddes I. *Fair Society, Healthy Lives (The Marmot Review).* Institute of Health Equity. 2010.
[35] Jefferies D, Holmes J. *Tackling the elective backlog – exploring the relationship between deprivation and waiting times.* https://www.kingsfund.org.uk/blog/2021/09/elective-backlog-deprivation-waiting-times [Accessed 11 Nov 2022].
[36] NHS England. Core20PLUS5 – An approach to reducing health inequalities. https://www.england.nhs.uk/about/equality/equality-hub/national-healthcare-inequalities-improvement-programme/core20plus5/ [Accessed 11 Nov 2022].
[37] Durrand J, Singh SJ, Danjoux, G. Prehabilitation. *Clinical Medicine.* 2019;19(6): 458–64. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6899232/
[38] Royal College of Surgeons of England et al. *Preoperative Assessment and Optimisation for Adult Surgery including consideration of COVID-19 and its implications.* 2021.
[39] NHS. *The NHS Long Term Plan*. 2019.
[40] West R. *Getting serious about stopping smoking: a review of products, services and techniques*. 1997.
[41] West R, Papadakis S. *Stop smoking services: increased chances of quitting.* National Centre for Smoking Cessation and Training. 2019.
[42] McNeill A, Simonavičius E, Brose L, Taylor E, East K, Zuikova E, Calder R, Robson D. *Nicotine vaping in England: an evidence update including health risks and perceptions, 2022.* Office for Health Improvement and Disparities. 2022.
[43] Action on Smoking and Health. *The Smokefree Great Britain Survey 2021: Public Opinion in England.* 2021.
[44] Hartmann-Boyce J, McRobbie H, Butler AR, Lindson N, Bullen C, Begh R, Theodoulou A, Notley C, Rigotti NA, Turner T, Fanshawe TR, Hajek P. Electronic cigarettes for smoking cessation. *Cochrane Database of Systematic Reviews.* 2021;9: 1-248.
[45] Aveyard P, Begh R, Parsons A, West R. Brief opportunistic smoking cessation interventions: a systematic review and meta-analysis to compare advice to quit and offer of assistance. *Addiction*. 2011;107(6): 1066-73. https://onlinelibrary.wiley.com/doi/10.1111/j.1360-0443.2011.03770.x
[46] NHS. *2022/23 priorities and operational planning guidance.* 2022.