

Smoking shisha

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Key points:

- there has been a huge surge in the number of shisha bars in the UK
- shisha is increasingly popular with young people
- some shisha users believe it to be neither as harmful nor as addictive as smoking cigarettes
- shisha containing tobacco exposes users to the harms of tobacco and the threat of addiction
- shisha smoking produces second-hand smoke
- herbal waterpipe products are not a healthy alternative to tobacco products
- shisha bars which sell tobacco must be on the Scottish Tobacco Retailers Register and display the relevant signage
- bars which sell lit, smoked tobacco-free shisha still need to comply with smoke-free legislation
- it is illegal to supply shisha to under 18s
- the global epidemic of shisha smoking is a serious public health problem.

This briefing aims to describe some of the evidence on shisha smoking and health, and the regulatory framework by which its usage is governed in Scotland. For the purposes of this briefing 'shisha smoking' refers to the specific use of combustible shisha mix in a waterpipe.

Introduction

Although it was once associated with community groups whose culture or religion prohibits the use of alcohol, shisha usage has recently emerged as a fashionable social pastime popular with students and young people¹ and now has the makings of a serious public health problem² in the UK and

worldwide. A Freedom of Information (FOI) request by the British Heart Foundation produced data from 133 local authorities in major towns and cities across the UK. The FOI data showed that the number of shisha bars has increased by 210% since 2007, from 179 in 2007 compared with 556 in 2012³, although so far there are only seven registered shisha premises in Scotland⁴. The 2009 Global Tobacco Youth Survey⁵ (which examined time trends [1999–2008] of tobacco use of over half a million youth aged 13–15 years) reported that whereas cigarette smoking is showing either stable or declining trends globally in this age group, other forms of tobacco use are showing a rising trend, mainly as a result of waterpipe smoking. In a 2012 survey of approximately 1,000 people aged 18 or over in Scotland, around 7% reported ever having used a shisha pipe. Most were infrequent users, with less than 1% reporting use once or twice a month or more frequently¹. The problem of shisha's increasing availability and visibility is compounded by a general belief that it is neither as addictive nor as harmful as smoking tobacco in cigarettes⁶. The World Health Organization has predicted that tobacco use will kill one billion people in the 21st century⁷, and although most will be killed by cigarettes it is nevertheless important to recognise that tobacco can be consumed in many other forms, all of them harmful. The rise in shisha usage, and its burgeoning popularity with young people has the makings of a global tobacco control crisis⁸.

What is shisha?

Shisha is a tobacco-based (although there are tobacco-free versions – see below) product designed to be smoked in a waterpipe. Egyptian tobacco companies began marketing 'ma'asel' (from the Arabic for honeyed) which came to be known as 'shisha' in the late 1980s⁹. Shisha comes in sweetened fruit flavours and produces a mild aromatic smoke which is more palatable to unseasoned palates, and this new sweeter product combined with the growth of social media may have fuelled the growth of use first in Arab countries¹⁰, and then the worldwide spread.

There are many different shisha products but usually it is a mixture of light leaf tobacco, molasses, vegetarian glycerine, and flavourings. The tobacco will have been infused with glycerine to maintain its moisture and fermented in molasses to create a base tobacco. It is available in a wide

¹ Figures are from YouGov Plc. Total sample size was 1055 adults. Fieldwork was undertaken between 27th February and 13th March 2012. The survey was carried out online. The figures have been weighted and are representative of all Scottish adults (aged 18+).

range of flavours such as cherry, bubble gum, cola, chocomint, vanilla, pina colada, sweet melon, strawberry, apple, lemon, rose, mint, mango etc¹¹. The flavours and colourful packaging have an obvious appeal to young people leading some commentators to describe shisha as the tobacco equivalent of ‘alcopops’¹² and there is emerging evidence that waterpipe use may be a precursor to future smoking, at least among Danish youth¹³. Unlike earlier waterpipe tobacco products, users do not need to moisten, shape, and dry the tobacco before use¹⁴, and the improved ease of use may be yet another contributing factor to its growth in popularity.

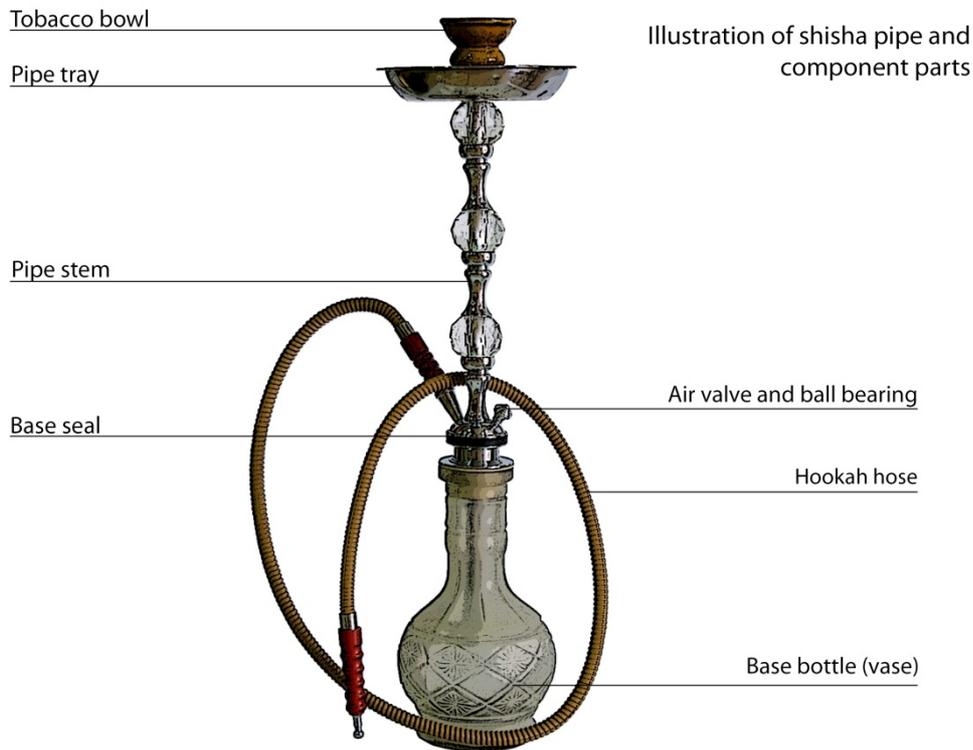
Tobacco-free shisha

Tobacco shisha and ‘herbal’ shisha tend to be poorly labelled and many shisha bars manually prepare non-standardized shisha mixtures on-site making it difficult to be confident about what ingredients the mix actually contains. Islington Council has suggested¹⁵ that the majority of shisha tobacco available in the UK is illegally imported, with no health warnings so the smoker can never be sure what is in the product, including the presence of tobacco in tobacco-free versions. Users may also be given a false impression of safety by labels which give misleading and inaccurate descriptions or claim to be ‘0% tar, 0.05% nicotine’ and ‘light’¹⁶.

A 2008 study carried out in Scotland¹⁷ cautioned that shisha smoking may result in exposure to harmful levels of hazardous substances and that nicotine-free tobaccos are also likely to be harmful because of the exposure to carbon monoxide, particles and polycyclic aromatic hydrocarbons. A crossover study comparing carbon monoxide, nitrous oxides, polycyclic aromatic hydrocarbons, volatile aldehydes, ‘tar’ and nicotine yields¹⁸ confirms that herbal waterpipe products give off the same amount of toxicants and do not therefore represent a ‘healthy’ alternative. How is shisha smoked?

A waterpipe (alternative names include, qalyan, goza, hubble-bubble, boory, narghile, lulava, cachimba and hookah) consists of a head, body, glass and one or more hoses. Shisha mix is placed in a bowl in the head of the waterpipe and (usually) covered with foil. Lit charcoal is then placed above the shisha mix (an electric heating element is sometimes used as an alternative but it is unclear how widespread this practice is). The smoke produced from the heated¹⁹ (rather than burned as with a cigarette) shisha mix is then inhaled through a mouthpiece connected to a hose on the pipe. The vacuum caused by the user sucking on the hose causes the smoke to

pass through the water cooling it (but not filtering all of the harmful effects, as is widely believed^{20 21}) and producing distinctive (hubble bubble) bubbles. Just as shisha comes in many flavours and may contain a wide range of non-standardised constituents²², waterpipes come in a huge range of sizes, types and regional varieties.



Health effects of smoking shisha

The extent to which smoking shisha is harmful to health depends on many variables including duration and frequency of use, the size and type of waterpipe used, the brand of shisha mix, the kind of charcoal and the temperature at which it burns, intervals between breaths and the depth and length of breath the user draws in etc. However, even in the absence of high-quality studies on the long-term health effects and standardized exposure measurement tools, available evidence suggests that shisha smoking is associated with many of the known risks of tobacco smoking. A case control study of hookah smoking and lung cancer in the Kashmir Valley of the Indian Subcontinent²³ concluded that hookah smoking is associated with a significantly higher risk for lung cancer in Kashmiri population, with about a six fold elevated risk as compared to non-smoking controls. A study from Iran has shown that there was a profound effect of waterpipe smoking on pulmonary function test values and respiratory symptoms,

which were similar to the effects of deep inspiration cigarette smoking²⁴.

In a systematic review²⁵, which applied the Cochrane Collaboration methodology, it was found that waterpipe smoking more than doubles the risk of lung cancer, respiratory illness and low birth weight. Another systematic review²⁶ reported that waterpipe use negatively affects lung function and may be as harmful as cigarette smoking so is likely to be a cause of chronic obstructive pulmonary disease (COPD)². In addition to inhaling toxicants produced from the tobacco, such as nicotine, tar, and nitrosamines, waterpipe smokers inhale large quantities of combustion-generated toxicants given off by the charcoal for, despite the generally low temperatures attained in the waterpipe tobacco, large quantities of carbon monoxide (CO) and polycyclic aromatic hydrocarbons (PAHs) have been found in the smoke²⁷.

Shisha to cigarette equivalency

A particular area of confusion surrounds cigarette to shisha equivalency, perhaps compounded by misreporting eg 'How an hour spent smoking trendy shisha pipes is as harmful as a HUNDRED cigarettes' in the Daily Mail²⁸, based on the oft quoted World Health Organization (WHO) statement '*(t)he waterpipe smoker may therefore inhale as much smoke during one session as a cigarette smoker would inhale consuming 100 or more cigarettes*'²⁹. The WHO were not suggesting that one shisha session is the same as smoking 100 cigarettes, rather that one session (they note that '*waterpipe smoking sessions typically last 20 to 80 minutes, during which the smoker may take 50 – 200 puffs which range from about 0.15 to 1 litre each*'³⁰) produces a lot of smoke. Other research has noted that '*depending on the toxicant measured, a single waterpipe session produces the equivalent of at least 1 and as many as 50 cigarettes*'³¹. However, recent shisha guidance for GPs³² suggests a simple '*equivalence of 10 cigarettes as one shisha session based on the fact that an average session lasts approximately 45 minutes*'. Similarly, a review published in 2007³³ notes that a meta-analysis of the human data indicated that daily use of the waterpipe produced a 24-hr urinary cotinine level of 0.785 µg/ml, a nicotine absorption rate equivalent to smoking 10 cigarettes/day. In the current absence of high quality research an equivalency of 10 cigarettes to one 45

²Both systematic reviews note problems with the study limitations used in the evidence they reviewed.

minute shisha session would therefore appear to be the most robust estimate currently available.

Carbon monoxide (CO)

The use of charcoal as a heating source generates large amounts of carbon monoxide (CO)³⁴. Carbon monoxide is colourless, odourless, and tasteless, but highly toxic. CO is a cellular poison which binds to haemoglobin 200 - 300 times more tightly than oxygen and inhibits the release of oxygen from haemoglobin to peripheral tissues, causing tissue hypoxia³⁵. There is growing evidence that exposure to low concentrations of carbon monoxide can affect a number of organ systems³⁶. Being exposed to carbon monoxide may cause significant damage to the heart and central nervous system³⁷ and cross the placenta in pregnant women³⁸. One study reports that 90% of the carbon monoxide (and 75 – 95% of the PAHs) emitted from waterpipes comes from the charcoal³⁹.

A recent (December 2012) report in the journal 'Prehospital and Medical Disaster' warns that 'emergency physicians need to be aware of the high levels of CO, with the consequent risk of clinical poisoning from waterpipe smoking'⁴⁰, although to date this is the only case study from the UK. A case study from Italy⁴¹ suggests that 'young patients presenting with unexplained confusion or nonspecific neurologic symptoms should be asked specifically about this exposure'.

Nicotine

A quantitative synthesis of limited human data from four nations indicates that daily use of waterpipes produces nicotine absorption of a magnitude similar to that produced by daily cigarette use⁴²; a meta-analysis of the human data (as noted in the cigarette equivalency section above) indicated that daily use of the waterpipe produced a 24-hr urinary cotinine level equivalent to smoking 10 cigarettes a day. Furthermore, findings in the same report did not support the prevalent belief that the water filtration removes an important fraction of the nicotine in the shisha tobacco⁴³. A study from Egypt suggests that waterpipe smokers exhibit many of the same features of nicotine dependency attributed to cigarette smokers⁴⁴. Indeed, there is emerging evidence that waterpipe use predicts regular cigarette smoking, at least among Danish youth⁴⁵. Tobacco products may be legal to use and easy to obtain but it would be a mistake to regard them as pharmacologically benign as they also meet the standard criteria for

dependence-producing drugs⁴⁶.

If an intake of 5 mg of nicotine per day represents an “addiction threshold”⁴⁷, then the threshold is met for those who smoke five or more cigarettes per day (1 mg nicotine per cigarette), although the threshold will vary from person to person and 5 mg may represent the highest threshold value that should be considered. A 2007 review by Neergaard et al⁴⁸ states that *‘the range of the current evidence clearly classifies daily use of the waterpipe as an addictive behavior. The meta-analysis further suggests that occasional use of the waterpipe is equivalent to smoking two cigarettes during a 24-hr period and thus is below an “addictive threshold.”’* Neergaard et al add the qualification that other research⁴⁹ indicates that long-term waterpipe smokers (>10 years of use) absorb more nicotine than do short-term waterpipe smokers (≤10 years).

Phenols

Phenols are chemical compounds thought to promote DNA mutation and cardiovascular diseases. A 2012 study in the Journal of Nicotine and Tobacco Research⁵⁰ found that relative to a single cigarette, a waterpipe delivers at least three times greater quantities of the 7 analysed phenols (phenol, o-cresol, m-cresol, p-cresol, catechol, resorcinol, and hydroquinone). Moreover, phenol derivatives such as methylcatechol, and flavourings such as vanillin, ethyl vanillin, and benzyl alcohol were found in quantities up to 1,000 times greater than the amount measured in the smoke of a single cigarette. The study goes on to report that for waterpipe smoking the intake per hour of smoking involves higher hourly phenol intake than cigarette smoking. This lends weight to existing evidence that large quantities of phenols and phenol derivatives in shisha smoke may increase the risk of cancer and cardiovascular diseases. The study noted that *‘in waterpipe smoking, the relatively low temperature of the burning tobacco mixture favours production and survival of phenol compounds’*.

Polycyclic aromatic hydrocarbons (PAHs)

PAHs are a group of powerful cancer-causing chemicals that can damage DNA and set cells down the road to becoming tumours. One of these chemicals - benzo(a)pyrene or BAP - is one of the most widely studied of all tobacco poisons. BAP directly damages p53, a gene that normally protects bodies against cancer⁵¹. The effects on human health depend on the concentration of PAHs and the type and extent of exposure. The foetus is

more susceptible than the adult to the effects of certain carcinogens, such as polycyclic aromatic hydrocarbons⁵². 75 – 95% of the PAHs emitted from waterpipes come from the charcoal⁵³. A study using shisha mix (10g) in a waterpipe found that a single smoking session delivers approximately 50 times the quantities of carcinogenic 4- and 5-membered ring PAHs as a single 1R4F³ cigarette smoked using the FTC protocol⁵⁴.

Misperceptions about shisha smoking

The American Lung Association has described waterpipe smoking as an ‘emerging deadly trend’⁵⁵ yet it is widely and erroneously perceived by users to be less lethal than other forms of tobacco use⁵⁶, and some users even believe that the water trap acts as an effective filter⁵⁷ (it doesn’t⁵⁸). Whereas user-generated YouTube videos (YouTube is the second most visited site on the web⁵⁹) related to cigarette smoking often acknowledge harmful consequences and provide explicit antismoking messages, many hookah-related (this includes shisha smoking) videos do not⁶⁰. Research from America suggests that roughly 50% of waterpipe users are not cigarette smokers so this emerging form of tobacco use appears to be affecting many individuals who might otherwise never have consumed nicotine products⁶¹.

A cross-sectional survey of medical students in the UK found that waterpipe smoking was more common than cigarette smoking (current 11.0% vs. 6.3%, ever 51.7% vs. 16.8%)⁶²; even among these medical students there was a lack of awareness about its harmful effects.

Does shisha smoking produce second-hand smoke?

A study which investigated and compared emissions of ultrafine particles carcinogenic polycyclic aromatic hydrocarbons (PAHs), volatile aldehydes, and carbon monoxide (CO) for cigarettes and waterpipes⁶³ found that a single waterpipe use session emits in the sidestream smoke approximately four times the carcinogenic PAH, four times the volatile aldehydes, and 30 times the CO of a single cigarette. The study went on to report that accounting for exhaled mainstream smoke, and given a habitual smoker smoking rate of two cigarettes per hour, during a typical one-hour waterpipe use session a waterpipe smoker probably generates ambient carcinogens and toxicants equivalent to 2 - 10 cigarette smokers, depending

³ The Kentucky Tobacco Research & Development Center equivalent to the experimental blend specified and used by the National Cancer Institute as their standard for experimental work.

on the compound in question. The study concluded that there was therefore good reason to include waterpipe tobacco smoking in public smoking bans.

Shisha and the law

Shisha smoking produces second-hand smoke and is therefore covered by smoke-free legislation which prohibits this in enclosed spaces. Even shisha products which do not contain tobacco must comply with Scotland's smoke-free legislation because the law applies to any lit, smoked product. According to Part One, Section Four of the Smoking, Health and Social Care (Scotland) Act 2005⁶⁴ 'smoke' means 'smoke tobacco, any substance or mixture which includes it or any other substance or mixture; and a person is to be taken as smoking if the person is holding or otherwise in possession or control of lit tobacco, of any lit substance or mixture which includes tobacco or of any other lit substance or mixture which is in a form or in a receptacle in which it can be smoked'.

Shisha bars selling tobacco products must be on the Scottish Tobacco Retailers Register (www.tobaccoregisterscotland.org) and they must display signage stating that it is illegal to sell tobacco products to anyone under the age of 18. The signage must:

- be a minimum size of 230mm by 160mm;
- display the international "no smoking" symbol, consisting of a graphic representation of a burning cigarette enclosed in a red circle with a red bar across it, at least 85mm in diameter; and
- display the name of the person to whom a complaint may be made by any person who observes another person smoke in the no-smoking premises in question and state that a complaint may be so made.

There are serious consequences for retailers who do not comply. The Tobacco and Primary Medical Services (Scotland) Act 2010 gives powers to Trading Standard Officers to issue fixed penalty notices for offences, including selling tobacco to under 18s and not being on the Retailer Register. If a retailer is found to be in breach of tobacco sales legislation three times within a two year period, a Local Authority can apply to the courts to have the retailer banned from selling tobacco. Those found to be

selling tobacco illicitly by not being on the Register can be fined up to £20,000 and sent to prison for up to six months.

As with other tobacco products, retailers are not permitted to advertise shisha tobacco products within their premises except by using a single advert at the point of sale. When the 2010 Scottish Tobacco Act puts an end to the promotional display of tobacco brands in retail outlets (29th April 2013 for large retailers and 6th April 2015 for small retailers) the promotional display of tobacco-based shisha products will no longer be lawful. For more information see the Scottish Government's display ban guidance at: www.scotland.gov.uk/Resource/0041/00412868.pdf

UK duty

Shisha tobacco mix is liable for duty. An Appeal Tribunal dismissed an appeal against a decision by the Commissioners for Her Majesty's Revenue and Customs (HMRC) to classify tobacco mix used in waterpipes as liable for duty. The Tribunal found that colloquially the use of the product is called 'smoking'; that technically when used as intended it does produce smoke, and the user inhales this and is therefore properly to be said to be smoking (appeal number: LON/2009/7071).

It is the responsibility of all producers or importers of shisha products to ensure that they:

- have used packaging which carries code-marking whereby the place, date and time of manufacture of the product can be determined and can provide to the Secretary of State for Health a list of those code markings if required
- have provided a list of ingredients
- meet the labelling requirements for tobacco products
- only sell products which are UK duty paid. Flavoured smoking tobacco is classified in the Integrated UK Tariff where an excise duty and an import duty must be paid.

Herbal smoking products

Budget 2012 announced the UK Government's intention to change the tax treatment of herbal smoking products in the UK. In this context, herbal smoking products are legally available products, designed for smoking, with

the appearance of cigarettes or other smoking tobacco. However, they do not contain any tobacco. The intention is that these products will be treated in the same way as products which do contain tobacco. This means that herbal smoking products will become liable to tobacco products (excise) duty. This change will ensure that the Tobacco Products Duty Act 1979 fully reflects Directive 2011/64/EC. The legislation is intended to form part of the 2013 Finance Bill. The change will take effect on and after 1 January 2014. For more information see HM Revenue and Customs information on treatment of herbal smoking products at: www.hmrc.gov.uk/tiin/2012/tiin4755.htm

Compliance and enforcement for shisha bars

A shisha bar in Glasgow has become the first (December 2012) to be prosecuted in court for flouting Scotland's smoking ban⁶⁵ although this business and others in the city have already faced several fixed-penalty notices for breaching smoke-free legislation.

Local Government Regulation (formerly LACORS), the Chartered Institute of Environmental Health and the Trading Standards Institute have jointly produced a guidance document which, although it is supplementary to the English rather than Scottish smoke-free legislation, contains useful information on compliance and enforcement issues. 'Supplementary guidance for local authority regulatory officers on dealing with non-compliance in shisha bars' is available to download from: www.cieh.org/uploadedFiles/Core/Policy/Public_health/Smokefree_work_places_and_public_places/Smokefree_Shisha_bars_guidance%281%29.pdf

Tower Hamlets Public Health in London has forged a multi-team approach with Trading Standards, Police Joint Enforcement Team and other regulatory officers from the council. Visits, led by the Smoke-free team, are made to shisha premises every two weeks to check for compliance and because premises change frequently the approach has to be persistent and regular⁶⁶.

Trading Standards departments have responsibility for enforcement of legislation relating to shisha products containing tobacco which are sold pre-packaged from retailers or within shisha establishments ready-prepared for smoking on the premises. Environmental Health departments in Scotland have responsibility for ensuring that the shisha bars are not flouting the laws on second-hand smoke by allowing shisha use in enclosed

areas, regardless of whether the shisha mix contains tobacco or not.

Underground shisha bars

Reports^{67 68} suggest that legitimate shisha bars are losing business to an 'underground' trade. New shisha smoking bars advertise themselves via social media such as Twitter or Facebook and customers gain entry by pressing a buzzer by the locked door or making a call from outside on their mobile phone. Underground shisha bars have little incentive to comply with smoke-free legislation or try to avoid underage sales. Locked doors, unregistered premises, shisha smoking in confined spaces, and operating outwith the knowledge of the fire department and building control services compound the risks.

Support to stop smoking shisha

A Cochrane Review reports that *'a clear understanding of dependence development in young waterpipe smokers should guide the development of effective cessation treatments for waterpipe smokers. Such treatments need to be tested with the help of high quality randomized trials'*⁶⁹. There are as yet no completed trials of smoking cessation interventions among waterpipe users.

The British Heart Foundation have produced a booklet called 'Smoking, shisha and chewing tobacco - How to stop' (also available in Urdu, Hindi, Gujarati, Punjabi and Bengali) which explains the health risk of smoking, cigarettes, pipe tobacco or shisha and chewing tobacco and gives advice on how to stop. It is available to download from:

www.bhf.org.uk/publications/view-publication.aspx?ps=1001327

Conclusion

Public health strategies for controlling the emerging issue of shisha usage should include the commissioning of rigorous epidemiologic and toxicological research to provide a solid evidence base; monitoring and where appropriate regulation of promotional activities; improved awareness and enforcement of existing tobacco control legislation; and awareness raising amongst young people.

Adolescence and young adulthood are times of heightened vulnerability for

both the initiation of tobacco use and the development of nicotine dependence⁷⁰. Smoking is an addiction of childhood rather than an adult choice⁷¹ (in the US nearly 9 out of 10 smokers start smoking by age 18 and almost no one starts smoking after age 25⁷²;

in the UK 66% of smokers start before 18, 83% by 19, and only 5% start smoking aged 25 or over⁷³) so it is vital that shisha is addressed as part of an overall strategy to prevent youth uptake. Interventions which restrict the affordability, accessibility, and marketing of cigarettes have been effective in reducing youth cigarette smoking^{74 75 76} and these, together with an extension of the ban on flavoured tobacco products to include products designed for use in waterpipes, might begin to address the very real health problems presented by the growth of shisha usage.

Key health messages for shisha users

- one shisha session lasting approximately 45 minutes may be roughly equivalent to smoking 10 cigarettes
- use of any product containing tobacco is harmful to health
- use of any product containing tobacco carries the risk of addiction
- waterpipe smoking more than doubles the risk of lung cancer, respiratory illness and low birth weight, negatively affects lung function and is likely to be a cause of chronic obstructive pulmonary disease (COPD)
- waterpipe products, even the tobacco-free herbal varieties, are not a healthy alternative to smoking cigarettes
- shisha smoking (including lit, smoked non-tobacco shisha) may result in exposure to harmful levels of hazardous substances.

For more information about tobacco control visit: www.ashscotland.org.uk

For support to stop using tobacco products visit:
www.canstopsmoking.com/

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8 Frederick Street | Edinburgh | EH2 2HB.
0131 225 4725
enquiries@ashscotland.org.uk

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