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Tobacco Use and Statistics

Course #17-4UK

Disclosure Statement:

- The content for this self-study CPD course was written by Carol A. Jahn, RDH, MS, and Deborah M. Lyle, RDH, BS, MS, employees of Water Pik, Inc.
- This article was designed, developed and produced by Water Pik, Inc.
- Water Pik, Inc., manufactures and distributes products addressed in this article.

Article Overview:

To help dental professionals understand changes in cigarette and tobacco use and how those changes are impacting oral and systemic health.

Learning Outcomes:

- Describe the changes in tobacco and cigarette use over the last decade
- Evaluate the potential risks of e-cigarette use
- Identify the health risks from using a hookah
- Explain the detrimental effects of cigar and smokeless tobacco usage

INTRODUCTION

China is the largest worldwide tobacco producing country, with an output of around 3.15 million tonnes of tobacco. Brazil follows with 851 million tonnes, then India at 830 million tonnes and the US, with 346 million tonnes.[1]

In 2012, the UK's consumer spending on tobacco products was estimated at £15.1 billion,[2] with around 85% of this spent on cigarettes. This brought in around £12.3 billion in tax revenue in 2012/13 — between 74% and 88% of the cost of cigarettes and hand rolling tobacco is tax in the UK. As such, the UK has one of the highest price tags for cigarettes and hand rolling tobacco in Europe, with only Norway being more expensive[3,4] and there are no signs that this trend will slow any time soon.

Combined with increased prices, health awareness, mandatory warnings on packaging, Smokefree legislation and a ban on almost all forms of marketing, this has generally helped drive prevalence of smoking down in the UK. Additional proposals such as plain packaging for all cigarettes, which was implemented in May 2016, may help to reduce numbers further.

Table 1 shows the results from the HM Revenue & Customs Tobacco Bulletin — July 2016, calculating receipts received from 2016/17 year-to-date (April to September).[5] It is important to note that these figures relate to the duty paid on tobacco products manufactured in or brought into the UK, and do not directly correlate with the amount of tobacco bought or smoked by consumers in the same time periods.

Smoking is the leading cause of preventable disease and death. It accounts for approximately 96,000 deaths a year in the UK, with the yearly death toll worldwide estimated to be 6 million.[6] It affects nearly every organ of the body and causes inflammation and impaired immune function. Young people who smoke into adulthood are likely to die early from a smoking-related illness. Exposure to second hand smoke is also causally linked to many diseases and chronic conditions.[7]

Table 1: Tobacco Types & Receipts Received

Tobacco Type	Receipts Received
Cigarettes	£2,287m *(12.6% lower than the same period in 2015/16)*
Cigars	£15.5m *(42.3% lower than the same period in 2015/16)*
Hand Rolling Tobacco	£384m *(4.7% higher than the same period in 2015/16)*
Other (e.g. Pipe & Chewing Tobacco)	£7m *(10.6% lower than the same period in 2015/16)*

Oral health is negatively impacted by smoking. People who smoke tobacco or marijuana are more likely to develop periodontal disease than non-smokers.[8,9] Tobacco smoking also appears to increase the risk of implant failure.[10] What's more, people exposed to second hand smoke have been shown to be at an increased risk for periodontitis.[11] Children exposed to second hand smoke have been shown to have a higher risk of decay in primary teeth.[12]

Cigarettes

A 2014 survey[13] found that about 19% of adults in Great Britain smoked cigarettes, which had reduced from a peak of 46% in 1974. Those aged 24-35 were most likely to smoke, although they averaged the lowest number of cigarettes per day compared to other age categories. Across all age groups, men were still more likely to smoke than women, although female smoking had increased slightly from the previous year. The same survey found that 23% of people with a personal income of up to £9,999 smoked cigarettes, compared to only 11% of those whose personal income was £40,000 or more. Among smokers, the average consumption is thought to be around 11.4 cigarettes a day — the lowest daily consumption noted since the Office for National Statistics began its survey series.[14]

It is believed that around 207,000 children aged 11-15 start smoking cigarettes every year in the UK.[15] However, figures suggest that the number of young people smoking is actually declining — with 18% of 15-year-olds admitting to having at least one cigarette in 2014, compared to 22% in 2013 and 53% in 1982 when the annual government survey began.[16]

About 90% of people who become addicted to cigarettes do so before the age of 18.[17] The children of mothers who smoked during pregnancy may be more likely to become regular smokers. Both parental and peer smoking may also encourage use.[18]

There is a strong association between mental illness and cigarette smoking. People with a mental health disorder are not only more likely to smoke, but are also more likely to smoke more heavily than those who smoke and do not report a mental health disorder **(Table 2)**.[19,20] The smoking prevalence among those with mental illness has been shown to range from 40% for those with common mental health disorders to 60% for people with probable psychosis and up to 70% for people in psychiatric units.[21]

Table 2: Mental Health Diorders Associated with Smoking

• Phobias	• Post traumatic stress disorder
• Panic disorder	• Attention deficit hyperactivity disorder
• Generalised anxiety disorder	• Schizophrenia, schizotypal and delusional disorders
• Bipolar Disorder	• Specific personality disorders
• Obsessive compulsory disorder	
• Probable psychosis	

People with mental illness are less likely to stop smoking. One factor may be that the nicotine delivers a mood-altering boost, thus providing a self-medicating effect. Another possibility is that tobacco smoke may accelerate the metabolism of some mental health medications and people compensate for that by increasing their intake of nicotine.

The Addictive Power of Nicotine

The 1988 Surgeon General's Report in the US concluded that "Cigarettes and other forms of tobacco are addicting." Prior to that, smoking was considered habitual. At the time, smoking was considered socially acceptable and there was a reluctance to use the term addict due to its connotation with illicit drug use. However, looking at smoking as an addiction helped refute the tobacco industry argument that people become smokers by their own free choice.[22]

The substance that makes tobacco addictive is nicotine. Today, more people are addicted to nicotine than any other abused substance. Nicotine activates the reward pathways that regulate feelings of pleasure. The effect of nicotine from a cigarette on the brain occurs within seconds of inhalation. The drug is associated with the release of adrenaline stimulating the body and causing an increase in blood pressure respiration and heart rate.[23] Like other addictive substances, dependence upon nicotine is characterised by impaired control over drug use, compulsive use, continued use despite harm and craving.[24]

Nicotine addiction is dependent upon dose and delivery. The bioavailability of nicotine is greatest via the lung or oral mucosa. Cigarettes are an ideal delivery system for creating nicotine dependence. The inhalation of tobacco smoke results in the intake of 1-2mg of nicotine per cigarette. The average smoker takes about ten puffs per cigarette, so people who smoke a pack of cigarettes per day would get up to 200 hits of nicotine to the brain every day. For cigar, pipe or smokeless tobacco users, the nicotine is absorbed through the mucosal membrane thus reaching the brain more slowly.[25] A recent study indicates that cigarettes today may contain 15% more nicotine than in 1999 potentially making them even more addictive than in the past.[26]

The adrenaline kick from a cigarette is short-lasting; hence the need for another cigarette. The reward centres stimulated by nicotine are similar to those seen with other abused drugs. When people stop smoking, they experience withdrawal symptoms **(Table 3)**. The symptoms can begin within a few hours of the last cigarette. This is a driving factor in why 85% of people who try to quit relapse within the first week. In many cases, withdrawal symptoms will subside within a few weeks; for some however, they may persist for months.

Table 3: Nicotine Withdrawal Symptoms

• Irritability	• Cognitive & Attention Deficits
• Anxiety	• Sleep Disturbances
• Craving	• Increased Appetite
• Depression	

The risk for nicotine addiction may be genetic.[27] Alcohol is also closely associated with smoking. Several studies have found a positive correlation between nicotine and alcohol use,[28,29] while others suggest that nicotine exposure increases alcohol self-administration[30,31] and smoking at an early age is even a risk factor for subsequent alcohol abuse.[32,33]

Electronic Nicotine Delivery Systems

Electronic nicotine delivery systems are battery-powered products that deliver nicotine in the form of an aerosol. They are commonly called e-cigarettes and the process is also referred to as vaping.

Despite reduced cigarette use throughout the UK, there has been a surge in the popularity of e-cigarettes in recent years. A 2014 Public Health England report suggested the market was worth an estimated £91.3 million a year,[34] with around 1.3 million users in the UK. However, the latest report from ASH (Action on Smoking and Health) indicates that an estimated 2.8 million adults currently use the electronic alternatives in Great Britain, representing a 400% increase in the past four years alone[35]. Is it safe to assume, therefore, that the market is already worth a lot more than initially hypothesised, with few signs of slowing. What's more, 13% of children aged 11-18-years-old admitted to trying e-cigarettes at least once, up from 5% in 2013.[36] 64% of children using e-cigarettes had tried tobacco first. Further still, more secondary school pupils in England reported having tried e-cigarettes at least once (22%) than traditional cigarettes (18%).[37]

There are a variety of reasons that teens try e-cigarettes, including the belief that the product is healthier than regular cigarettes **(Table 4)**.[38] Factors that influence the continued use of e-cigarettes after experimentation, including trying to quit regular cigarettes, low cost and the fact that e-cigarettes can be used anywhere.

Table 4: Reasons for Trying E-Cigarettes	
• Good flavours	• Friends' use
• Does not smell bad	• Can use anywhere
• Can hide it from adults	• Trying to quit regular cigarettes
• Low cost	• Healthier than regular cigarettes

E-cigarettes appear to be both a gateway to cigarette use and a potential smoking cessation tool. Emerging data indicates that never-smoking youths who use e-cigarettes are 6.17 times more likely to initiate cigarette smoking as those who do not try e-cigarettes. E-cigarette users have also been shown to be more likely to use a shisha, cigar or pipe.[39] In regards to smoking cessation, a recent systematic review found that while a majority of studies did show a positive correlation between e-cigarettes and smoking cessation, the evidence overall is inconclusive due to the low quality of published research. The authors noted that e-cigarettes may be helpful for some smokers who want to quit or reduce use because they can reduce withdrawal symptoms and cravings.[40]

Still a relatively new concept, the e-cigarette remains a somewhat controversial topic in the UK and around the world. While some believe they are a useful cessation adjunct, there is no evidence of the long-term effects of e-cigarette use and concerns have grown as to whether they are safe.[41] What's more, studies have found that the actual amount of nicotine delivered is likely to be highly variable and labelling is not accurate from all manufacturers.[42]

Cigars

Cigars were once highly popular in the UK, although their use has declined significantly in the past couple of decades, with the number manufactured decreasing by nearly 60% from 98,000 million in 1989 to 58,500 million in 2009.[43] A 2009 study found that only 2% of men smoked at least one cigar a month.[44]

Unlike cigarettes, the nicotine from this product is absorbed through the oral mucosa instead of the lungs.[45] Because of this, people mistakenly think that cigars are safer than cigarettes. The data, however, shows that cigars carry many of the same health risks as cigarettes.[46]

There are three types of cigars; large cigars, cigarillos and mini cigars **(Table 5)**. Large cigars contain as much as 20 grams of nicotine; the equivalent of a pack of cigarettes. When smoking a cigar, the smoke is generally not inhaled. A large cigar may take one to two hours to smoke.

Table 5: Overview of Cigars[47]		
Type	**Size**	**Amount of Nicotine**
Large Cigars	> 7 inches	Up to 20 grams
Cigarillos	3-4 inches	About 3 grams
Little cigars	Cigarette size & shape	About 1 gram

Smokeless Tobacco

With regards to other smoking habits, pipe smoking and smokeless tobacco have become all but forgotten about in the UK. In 2009, the Office for National Statistics found that less than 1% of men smoked a pipe, all of whom were above 50-years-old.[48]

With regards to smokeless tobacco, only nasal snuff and chewing tobacco are permitted for sale in the UK. The EU adopted a directive in 1992 that prohibited the sale, but not possession of snus (moist tobacco which is placed under the lip) in all EU member states except Sweden. As to whether these laws might be adjusted when the UK leaves the EU, we can only guess at this stage.

Unfortunately, there is very little research into the use of smokeless tobacco in the UK, so its popularity is difficult to predict. The few studies that are available suggest chewing tobacco (usually betel quid or paan) is most common among South Asian (Pakistani, Indian and Bangladeshi) communities in the UK, with a 2004 survey finding that 9% of Bangladeshi men and 16% of Bangladeshi women reported using chewing tobacco.[49]

Like cigars, smokeless products are also absorbed through the oral mucosa. In addition to nicotine, smokeless tobacco has been found to contain at least 28 cancer causing chemicals.[50]

Shisha

A shisha, otherwise known as a waterpipe, hookah, narghile or hubble bubble, is an ancient form of smoking, although its actual origins are widely debated. A systematic review of 38 studies examining the global prevalence of shisha use found an increase in use, not only in Middle Eastern regions, but also in western countries.[51] A national cross-sectional survey of over 21,000 adults in Great Britain in 2012/13 found that 12% of adults had tried a shisha, while only 1% used it regularly.[52] Frequent use remained more prevalent among adults of Asian (7%), Mixed (5%) and black (4%) ethnicities compared to white adults (0.5%). According to an October 2015 ASH fact sheet,[53] YouGov surveys in 2014 and 2015 provided similar results.

All these surveys also concluded that waterpipe smoking is more prevalent among younger adults, which was supported by a survey of secondary school students aged 11-16 years-old in Stoke-on-Trent.[54] Lifetime shisha smoking (12%) was found to be more common than drug use (6.5%), although less than cigarette (22.2%) and alcohol (49.2%) use, while also being more prevalent among older teenagers, males and people of South Asian ethnicity.

The modern waterpipe typically has a head with holes in the bottom, a metal body, a water bowl and a flexible hose with a mouthpiece. The bowl is partially filled with water and the head is filled with moistened tobacco, which is often flavoured and placed over burning charcoal. Shisha smoking is generally done in a group with the mouthpiece passed from person to person. The average amount of smoke inhaled during a waterpipe session is about 90,000 milliliters (ml) compared to 500-600 l from one cigarette.[55] While shishas are often perceived as less harmful than cigarettes, evidence indicates that one shisha use episode is associated with 1.7 times as much nicotine, 8.4 times as much carbon monoxide, and 36 times as much tar. Daily waterpipe use has been correlated with smoking about ten cigarettes per day.

Marijuana

A 2014/15 report by the Home Office[56] found that 6.7% of adults aged 16-59 had used marijuana that year, with a higher incidence of usage among 16-24 year-olds (16.3%). The same document suggested that use of cannabis has remained stable in the past few years, with any changes not proving to be statistically significant.

Marijuana is the dried leaves, flowers, stems and seeds from the hemp plant, Cannabis sativa. The active agent in marijuana is delta-9 tetrahydrocannabinol (THC), a mind altering agent. Marijuana is most commonly smoked as a rolled cigarette (joint) or in a bong. It can be mixed into food such as brownies or brewed as tea. When smoking marijuana, the THC quickly passes from the lung into the bloodstream, brain and other organs, resulting in a high within minutes. When eating or drinking marijuana, the body absorbs THC more slowly with the effect taking place within 30-60 minutes.[57]

The amount of THC in marijuana has increased over the last few decades. A new method is smoking or eating THC rich resins extracted from marijuana. This practice is called dabbing. These extracts can deliver extremely large amounts of THC to users.

Marijuana is a Class B drug in the UK under the Misuse of Drugs Act 1971, with legal penalties including up to five years imprisonment and/or a fine for possession and up to 14 years imprisonment and/or a fine for supply.

Cannabis is not recognised as having any therapeutic value under the law in England, Wales and Scotland. However, Sativex is a cannabinoid oromucosal mouth spray that can be legally prescribed and supplied by doctors to patients over the age of 18 to help with moderate to severe spasticity caused by Multiple Sclerosis (MS). Sativex is a Schedule 4 Part 1 controlled drug[58] with no additional requirements for prescription in the NHS other than those that apply to all Prescription Only Medicine (POMs).[59] Contraindications for prescription include hypersensitivity to cannabinoids or any of the excipients, known or suspected history or family history of schizophrenia or other psychotic disorders, and women who are pregnant or breastfeeding.

There have also been reports in recent months that a new cannabidiol product could be making its way to the legal market. The also non-psychoactive MediPen is effectively a cannibidiol vapouriser, designed to help people overcome a variety of conditions from depression and anxiety to arthritis and fibromyalgia. It seems the manufacturers have been consulting with a team of production and regulatory support pharmacists from the NHS to test the proprietary cannabis oil formulation and assess its potential health benefits.[60]

Regulation of Smoking in the UK

Smoking of cigarettes, hand rolling tobacco, cigars and smokeless tobacco is restricted to over 18s in the UK, with proof of identification required when purchasing products. Most retailers are encouraged to follow the 'Challenge 25' or 'Think 25' campaigns, where upon someone who looks under the age of 25 should be asked for proof of age. (The same campaign often covers the purchase of alcohol as well.)

Throughout the UK, smoking has been banned from virtually all enclosed or substantially public places since July 2007 (that is, all premises with a ceiling or roof where there are permanent openings other than windows and doors, which in total are less than half of the area of the walls). Smokefree legislation in England now forms part of the Health Act 2006,[61] following implementation of a similar law in Scotland in 2006 and in Wales and Northern Ireland in April 2007.

Taking this one step further, a new law was implemented in October 2015 that prohibited smoking in cars where children under the age of 18 were present (with the exclusion of e-cigarettes). This followed extensive research that found the amount and potential harm caused by second hand smoke in cars was far higher than that experienced in buildings, even in moderately ventilated conditions.[62,63,64] A Canadian study found that a single cigarette smoked in a stationary car with its windows closed can produce a level of second hand smoke 11 times higher than that found in an average bar where smoking is permitted. In a moving car, the second hand smoke reached levels 7 times higher than the smoky bar.[65]

Currently, all tobacco/nicotine products are regulated by the EU Tobacco Products Directive, which, as of May 2016, also included e-cigarettes. The only exceptions to this will be for products containing more than 20mg/ml of nicotine or those that are accompanied with therapeutic claims, which would require medicines authorisation under Directive 2001/83/EC.[66]

SUMMARY

As cigarette smoking declines, it's important to remember the associated popularity of other tobacco/nicotine products. The use of more than one product has also become more common and needs to be considered.

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POST TEST COURSE #17-4UK
Tobacco Use and Statistics

1. **Approximately how much revenue did the tax on tobacco bring into the UK in 2012/13?**

   a. £10 billion
   b. £11.2 billion
   c. £12.3 billion
   d. £13.2 billion

2. **Approximately how many deaths are caused by smoking in the UK?**

   a. 60,000
   b. 69,000
   c. 90,000
   d. 96,000

3. **What percent of adults in the UK smoke cigarettes?**

   a. 10%
   b. 19%
   c. 22%
   d. 30%

4. **23% of people with an annual income of up to £9,999 smoke cigarettes in the UK. However, a higher percent of people with an annual income of £40,000 smoke cigarettes.**

   a. Both statements are true
   b. The first statement is true; the second statement is false
   c. The first statement is false; the second statement is true
   d. Both statements are false

5. **People with a mental health disorder are:**

   a. More likely to smoke
   b. More likely to be a heavy smoker
   c. Less likely to quit
   d. All of the above

6. **Nicotine intake can cause:**

   a. Release of adrenaline
   b. Increase blood pressure respiration
   c. Increase in heart rate
   d. All of the above

7. **Cigarettes today contain how much more nicotine than they did in 1999?**

   a. 5%
   b. 10%
   c. 15%
   d. 20%

8. **E-cigarettes are attractive to teens because:**

   a. Good flavour
   b. Can hide from adults
   c. Perceived as less harmful than cigarettes
   d. All of the above

9. **How is nicotine absorbed by the body when smoking cigars?**

   a. Through the oral mucosa
   b. In the lungs
   c. Through the skin on the hands
   d. No nicotine is absorbed when smoking cigars

10. **What percentage of adults in Great Britain have tried a shisha?**

    a. 0.5%
    b. 12%
    c. 22%
    d. 49%

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Name:

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Practice Answer Sheet

Please circle the correct answer for each question.

1.	a	b	c	d
2.	a	b	c	d
3.	a	b	c	d
4.	a	b	c	d
5.	a	b	c	d
6.	a	b	c	d
7.	a	b	c	d
8.	a	b	c	d
9.	a	b	c	d
10.	a	b	c	d
11.	a	b	c	d
12.	a	b	c	d
13.	a	b	c	d
14.	a	b	c	d
15.	a	b	c	d

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