Nicotine Toothpicks: 
Another Splinter of the Oral Tobacco Market

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**Introduction:**

Faced with a decline in the use of its traditional products, the tobacco industry is diversifying with many newly introduced products entering the market. In addition to the myriad varieties of e-cigarettes and heated tobacco products, a rapidly growing category is recreational oral nicotine including pouches, lozenges, and gums. A recently emerging form of oral tobacco product is nicotine toothpicks. In a comprehensive search of PUBMED we were able to identify only a single academic publication addressing this product type. A 1991 Swiss study compared laboratory produced nicotine infused toothpicks with nicotine gum and found that both achieved comparable plasma nicotine levels.¹ A search of the Truth Tobacco Industry database for “toothpicks” revealed a paucity of documents referring to toothpicks as a means of nicotine delivery, with the exception of industry commentary on the above mentioned 1991 paper. A 2008 RJ Reynolds document on innovative smokeless products referred to its short-lived Camel Sticks (2009-13) as: “like nicotine toothpicks with the option to break off a piece and let it dissolve in your mouth.”² This product has many dissimilarities to toothpicks. Because nicotine toothpicks are proliferating on the market, it seemed worthwhile to characterize their properties and practices including nicotine strength, flavors, sales channels, and advertising claims. The applicability of US Federal tobacco regulations to nicotine toothpick brands currently on the market is another topic of interest.

**Methods:**

Nicotine toothpick brands were identified via Google search and querying several leading online vendors of nicotine products. A patent search was also conducted. After identification of brands, their websites and social media postings on Instagram, Facebook, Twitter, and YouTube were surveyed.

**Results:**

**Patents:**

The earliest nicotine toothpick patents we identified were filed in Switzerland in 1990 for “Anti-smoking toothpicks - impregnated with nicotine” followed by a 1993 US patent for a “tobacco-impregnated toothpick.”³,⁴ A 2005 US patent described nicotine toothpicks as a: “delivery system that may effectively be substituted for smoking” and an “addiction breaking
system would include toothpicks of different levels of dosages of nicotine.” A 2006 US patent illustrates a “Method for making a nicotine toothpick” which describes impregnation with a “nicotine powder solution.” Noteworthy is a 1991 patent for nicotine dental floss which can be purchased online from its inventor.

**Brands:**

Nine toothpick brands were identified: Zippix, CRAVE, Nicotine Picks, Smart Toothpicks, Pixotine, Xero Picks, Nic Picks, Nic Sticks, and Stokes Picks. (Table 1, Figure 1). These are offered in nicotine concentrations between 1 and 5 mg per stick. In terms of flavors, some variant of mint (mint, menthol, or ice) were offered by all 9 brands and cinnamon by 7 brands. Candy flavors included sour candy and butterscotch while fruit flavors included strawberry, apple, and grape. Although they contain youth appealing flavors and nicotine, most of these products did not come with child resistant packaging (CRAVE was an exception). Alcoholic flavors, absinthe and sweet whisky, were offered by two brands. Several of these brands also offer nicotine-free toothpicks. For example, nicotine toothpick purveyors Zippix and Smart Toothpicks also sell toothpicks infused with vitamin B12.

**Use of a Nicotine Toothpick:**

The method of use for nicotine toothpicks is somewhat different from traditional toothpicks. As described on the Nicotine Picks website: “Simply place a single toothpick in your mouth between your cheek and gums and allow the nicotine to absorb into your bloodstream. You’ll experience a peppery feeling with a burst of your selected flavor. We recommend rotating the unused end of the toothpick to the other side of your mouth and enjoying it in the same manner. A slight chew on the toothpick will aid in a speedier release of nicotine. Please chew lightly as toothpicks are a choking hazard and should not be swallowed. Avoid rubbing eyes after handling toothpicks.”

**Advertising:**

The predominant advertising themes, consistently utilized by all brands, is freedom to use in places you cannot smoke and a means of avoiding the stigma associated with smoking. (Figure 2) This messaging is exemplified by Zippix: “Perfect for use in public places, the office or job site, or around children and family . . . Zippix sticks are totally socially acceptable.” Similarly, CRAVE
Toothpicks claims: “Great for the office, family events, lying in bed where a noisy vape would wake up your partner, restaurants, bars or any place where you really need your nicotine fix and do not want the negative attention of vaping or smoking.”

Some advertisements profess nicotine toothpicks will benefit health, such as improving brain and lung function: “Stokes Toothpicks allow you to enjoy the cognitive-enhancing effects of Nicotine, without the health impacts of Vapes and Cigarettes. Breathe easy with our delicious toothpicks . . .” Stokes goes on to describe the: “pleasant cerebral effects of Nicotine, without the unpleasant connotations accompanying tobacco-products.” Smart Toothpicks claims it is “A catalyst to promote a healthier way of life… in a flavorful way!”

Although not authorized by the US Food and Drug Administration (FDA) as smoking cessation products, implicit claims abound. Zippix describes its toothpicks as: “Totally satisfying” and that they effectively “curb cravings.” Pixotine claims its toothpicks are: “A way to get that nicotine satisfaction without the use of traditional tobacco leaf products.” Its advertising goes on to claim that: “Pixotine allows for hand to mouth motions and the oral fixations commonly associated with tobacco/nicotine users.” Smart Toothpicks claim that: “Each toothpick provides about the same amount of nicotine found in a cigarette (3mg).”

Brands such as Smart Toothpicks and Pixotine use themes of patriotism and fishing within their advertisements that would typically attract older, blue-collar men. Nicotine Picks specifically uses older models in their advertisements. Zippix deviates from this trend by use of cartoons and younger, attractive models to advertise their product. (Figure 3)

The main advertising channels for nicotine toothpick brands are the company’s website and social media, especially Instagram and Facebook, where their pages tend to have a small following and little engagement. Google Shopping carries paid advertisements for Zippix, Pixotine, and Nicotine Picks. During our research, pop up advertisements for Pixotine appeared on news websites. (Online Figure 1)

Sales Channels:

All brands are sold online via the company’s website, but most seem to have little market presence beyond. Few online stores carrying multiple tobacco products carried the products. For example, Smart Toothpicks and Pixotine are on Smoker’s Outlet Online. While major online retail outlets (e.g. amazon.com, walmart.com, target.com, cvs.com) sell a variety of toothpicks and
nicotine replacement therapies, they do not vend nicotine toothpicks. Pixotine is the only nicotine toothpick brand with substantial retail presence. Its website claims that it is sold nationwide in chain convenience store (e.g. 7-11, Quickchek) gas stations (e.g. Chevron, Arco, Quick Trip), and smoke shops and vape shops. In 2019, Pixotine was voted by retailers the CSP award (Convenience Store News) for best new product in the tobacco category. Nicotine toothpick packages come with from 15 to 50 toothpicks at a price per toothpick ranging between $0.20 and $0.40. (Table 1)

**Regulatory:**

As a nicotine delivery product, nicotine toothpicks should require application for authorization to be on the market via the FDA Pre-Market Tobacco Product Application (PMTA) process. A search of submitted PMTA applications found that Pixotine was the only brand to file. Zippix has applied for exemption to the PMTA claiming that it was on the market prior to the 2007 and thus is grandfathered. The owner claims that his compounding pharmacy has been making and selling nicotine toothpicks since 1993 which were promoted to pulmonary physicians and respiratory therapists. A couple of brands (CRAVE, Stokes Pick) assert that they are made from non-tobacco derived nicotine and thus may be exempt from FDA oversight. In January 2020, the FDA issued a warning letter to Smart Picks, LLC criticizing underage sales via the company’s website, unapproved modified risk claims, and lack of required nicotine warning label. As of August 2021, the brand remains on sale via its website. Nicotine toothpicks should carry FDA mandated addiction warning labels. Some brands have no warning label at all, while others have non-compliant labels, such as Zippix, whose warning is on the backside of the package only.

**Discussion:**

Toothpicks have been used since antiquity. The modern market includes picks fabricated from many materials and are offered in innumerable flavors. Medicated toothpicks on the market are infused with caffeine, vitamin B12, and cannabis derivatives THC and CBD. Nicotine impregnated toothpicks are a relatively new phenomenon. All of the nine brands identified in this study are small, privately held companies for which nicotine toothpicks are their only tobacco product. With the possible exception of Pixotine, which claims a nationwide retail presence and has filed a PMTA, brands appear to be small, boutique entities. It does not appear that any of the major tobacco companies have yet to add nicotine toothpicks to their portfolio.
Nicotine toothpick brand advertising is primarily calibrated to appeal to an older, male demographic. However, Zippix advertisements have a youthful orientation. While brands use social media promotion via Facebook and Instagram, which are heavily trafficked by youth, they have drawn few followers. Nevertheless, media reports reveal concern over use of nicotine toothpicks in American schools.\textsuperscript{23,24} One attribute of nicotine toothpicks which may draw youth attention is their stealthiness. Unlike smoking and vaping which are recognizable as smoking implements, and leave both telltale ploom and odor, nicotine toothpicks cannot be distinguished visually from ordinary toothpicks.

As a nicotine delivery system, nicotine toothpicks should be held to the full scope of FDA tobacco regulations including prior approval to be on the market (PMTA), compliance with good manufacturing processes, advertising restrictions (e.g. no use of cartoons), childproof packaging, and mandated addiction warning labels. Given the paucity of scientific data regarding nicotine absorption via toothpicks and their impact on oral health, achieving PMTA approval given the present state of development seems improbable.
References:


Figure Legends:

Figure 1. Nicotine toothpicks resemble ordinary toothpicks and are marketed in a variety of package designs which either lack, or have non-compliant nicotine warning labels. The figure was created by the authors.
**Figure 2:** Advertisements from Pixotine website emphasizing that their nicotine toothpicks can be used “Anywhere . . . Anytime!” The figure was created by the authors. The images were obtained from Pixotine brand Instagram page.
**Figure 3**: Social media posts of ZIPPIX and Nicopicks nicotine toothpicks. These incorporate advertising themes including cartoons, health care workers, and bikini clad women. The figure was created by the authors. The images were obtained from brand Instagram pages.
Online Figure 1: Pixotine Toothpick popup advertisements on CNN, The Wall Street Journal, and Huffington Post (August 2021). Figure compiled by authors.
Table 1: Nicotine toothpick brands, their nicotine source and strength, flavors, price, and whether or not the brand has applied to the FDA for Pre-Market Tobacco Product Application (PMTA).

<table>
<thead>
<tr>
<th>Brand</th>
<th>Launch Date</th>
<th>Nicotine Levels</th>
<th>Nicotine Type</th>
<th>Flavors</th>
<th>Price per toothpick</th>
<th>PMTA Submitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zippix</td>
<td>1993*</td>
<td>2 mg 3 mg</td>
<td>Tobacco Derived</td>
<td>Peppermint, Watermelon, Cinnamon, Mocha, Sweet Wood, Sweet Whisky [sic], Spice Island Clove</td>
<td>$0.30</td>
<td>No</td>
</tr>
<tr>
<td>CRAVE</td>
<td>2020</td>
<td>3 mg</td>
<td>“Synthetic”</td>
<td>Sweet Melon, Cinnamon, Pina Koolada, Pumpkin Spice Latte, Butterscotch Cake, Sour Candy, Mint, Strawberry Cheesecake</td>
<td>$0.20</td>
<td>No</td>
</tr>
<tr>
<td>Nicotine Picks</td>
<td>2007</td>
<td>3 mg</td>
<td>“Tobacco-free”</td>
<td>Cinnamon, Spearmint, Grape, Orange, Sour Apple, Peppermint, Butterscotch, Cherry</td>
<td>$0.30</td>
<td>No</td>
</tr>
<tr>
<td>Smart Toothpicks</td>
<td>2016</td>
<td>3 mg</td>
<td>Tobacco Derived</td>
<td>Cinnamon, Peppermint, Wintergreen</td>
<td>$0.35</td>
<td>No</td>
</tr>
<tr>
<td>Pixotine</td>
<td>2013</td>
<td>3 mg</td>
<td>“Tobacco leaf-free”</td>
<td>Cinnamon, Original, Tobacco, Winter Ice</td>
<td>$0.40</td>
<td>Yes</td>
</tr>
<tr>
<td>Xero Picks</td>
<td>2018</td>
<td>1 mg 2 mg 3 mg</td>
<td>Tobacco Derived</td>
<td>Cinnamint, Menthol Mint</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Nic Picks</td>
<td>2017</td>
<td>3 mg</td>
<td>Tobacco Derived</td>
<td>Spearmint, Peppermint, Strawberry Menthol and Coffee</td>
<td>$0.25</td>
<td>No</td>
</tr>
<tr>
<td>Nic Sticks</td>
<td></td>
<td>3 mg</td>
<td>Tobacco Derived</td>
<td>Fire &amp; Ice, Cool Mint</td>
<td>$0.35</td>
<td>No</td>
</tr>
<tr>
<td>Stokes Picks</td>
<td>2021</td>
<td>5 mg</td>
<td>“Tobacco-free”</td>
<td>Absinthe, Cinnamon Clove, Lemon Ginger, Vanilla Mint</td>
<td>$0.31</td>
<td>No</td>
</tr>
</tbody>
</table>

*Claimed by the company in its application for a grandfather exemption to the PMTA.