RESEARCH CONCLUDES DENTAL WAX DISPENSED TO PATIENTS VIOLATES REGULATORY REQUIREMENTS IN THE U.S. AND EUROPEAN UNION

A Whitepaper By:

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Background

As covered in previous white papers, editorials, and survey results, conventional dental wax dispensed globally to orthodontic patients by their orthodontists is believed to be one of the few remaining commonly dispensed oral care products that do not conform with several universally accepted quality and safety standards. Namely: unit of use/hygienic packaging, tamper-evident packaging, labeling with product traceability, and disclosure of ingredients.[1-4] This paper addresses the implications of providing conventional/unlabeled dental wax without labeling or product traceability to the end patient. In particular, this paper outlines the noncompliance with medical device requirements in the U.S. as well as the European Union. This paper also addresses how these same regulatory violations may result in deficiencies with respect to the Adverse Event Reporting requirements set forth by the U.S. Food and Drug Administration ("FDA").

Surprisingly, many suppliers of dental wax continue to resist conformance with longstanding quality standards and regulations. In March of 2019 OrVance notified over 30 suppliers to the orthodontic profession of the noncompliance of conventional dental wax (see Exhibit A). Additionally, a full-page trade advertisement was run in both the U.S. and UK in May, 2019 to alert the orthodontic industry of the quality and compliance issues with conventional dental wax (see Exhibit B). Exhibit C is a letter written in June 2019 to the American Association of Orthodontists, which outlined the specific quality and compliance issues with conventional dental wax. None of these communications or advertisements have been met with any credible denial or pushback.

While several suppliers have agreed that conventional dental wax is often marketed and distributed in a noncompliant manner, there continues to be resistance to the notion that the orthodontic industry should prioritize bringing all dental waxes into full compliance with medical device regulations. This reluctance appears to stem, in part, from the tenuous belief that a product which has been marketed worldwide for so long must not have any safety or public health concerns, so the cost to industry

associated with worldwide regulatory compliance simply isn't worth it.

Since these questions around U.S. and E.U. regulatory compliance, and around the historical safety profile of conventional dental wax, have kept coming up, we've set out to research and address these issues with third-party experts and report our findings here in this white paper.

Definition of "Dental Wax" as addressed in this Research

For the purpose of this white paper, we define dental wax[1] as the conventional/unlabeled "wax" intended to be used by orthodontic patients to provide relief from pain and irritation caused by orthodontic appliances, protecting the linings of the patient's cheeks and lips. These dental wax composites come in connected strips within a plastic case that is most commonly dispensed to patients in orthodontic treatment throughout the world (Note: this white paper does not address dental wax that is sold over-the-counter to consumers at retail; it is limited to dental wax distributed to patients through their orthodontists). The "wax" composite is intended to be used by tearing off a "pea-sized" piece and applied after drying the bracket. Given its intended purpose, it is not uncommon for the wax to come in contact with saliva and occasionally blood. It is also not uncommon for the wax to crumble / fall off and be swallowed by patients during use. Finally we note that these dental waxes are occasionally shared among patients and between children with braces, in school settings or otherwise.[3]

In spite of the above uses, many of the dental wax products being distributed are (1) unlabeled and without adequate means of product traceability, (2) not offered in single unit-of-use/hygienic packaging, (3) not delivered with tamper-evident packaging, and (4) lacking disclosure of ingredients. Below is a picture of the typical conventional dental wax that is most commonly dispensed globally to patients in orthodontic treatment.

Known Regulatory Violations with Conventional Dental Wax

For generations, many suppliers to the global orthodontic industry have been collectively selling conventional, unlabeled dental wax in virtually every country where orthodontic treatment exists. But while the absence of any labeling on the end unit has been a cheap and easy way to supply the global market, it is not globally compliant. To illustrate, we will explain how unlabeled wax violates

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[1] In the United States, the U.S. Food and Drug Administration defines intraoral dental wax as a "*device made of wax intended to construct patterns from which custom made metal dental prostheses, such as crowns and bridges, are cast. In orthodontic dentistry, the device is intended to make a pattern of a patient's bite to make study models of the teeth."*[5] (21 CFR 872.6890). Although the dental waxes that are the subject of this white paper do not exactly fit FDA's regulatory definition of "intraoral dental wax," in practice the agency and industry include conventional dental wax products within the scope of 21 CFR 872.6890 for the sake of FDA registration, listing, etc. Hence, conventional dental waxes are Class I medical devices under FDA's regulations, and are usually exempt from some—but certainly not all—of the current good manufacturing practice requirements of FDA's quality system regulation.

longstanding medical device labeling regulations in many countries, particularly the U.S. and the entire European Union (EU).

Medical device labeling regulations around the world serve a number of public health and safety purposes, including enabling meaningful product traceability and providing consumers with appropriate contact information should they have any questions, concerns or otherwise need to report a problem with the device. These globally accepted safety norms led to the adoption of medical device labeling regulations in many countries, including the U.S. and the E.U. decades ago.

U.S. FDA's Medical Device Labeling & Adverse Event Reporting Requirements

In the United States, under Section 502(b) of the Federal, Food, Drug, and Cosmetic Act (FD&C Act) (21 U.S.C. 352(b)), a medical device in package form is misbranded if its label fails to specify conspicuously the name and place of business of the manufacturer, packer, or distributor (See also 21 CFR 801.1). Section 301 of the FD&C Act clearly states "the introduction or deliver for introduction into interstate commerce of any… device… that is adulterated or misbranded" is a prohibited act (21 U.S.C. 331(a)). Furthermore, misbranded devices are subject to regulatory enforcement action being initiated by FDA, such as seizure or injunction (see, e.g., Exhibit D, which is a formal legal opinion specifying the noncompliance of unlabeled dental wax with U.S. FDA medical device labeling regulations).

Conventional dental wax is no exception to these labeling rules, and officials within FDA's Division of Dental Devices will explicitly state that the labeling regulation at 21 CFR 801.3 applies. Indeed, when directly asked, FDA agency personnel responded by stating that while these devices "are exempt from premarket notification… [and] also exempt from [certain] GMP… [t]his *exemption does not apply, however, to labeling requirements*, per 21 CFR part 801," and that "devices, whether, exempt from premarket notification or not, *must comply with these as general controls*" (2019 email correspondence from FDA, emphasis added).

Many may find the extent to which unlawful conventional dental wax has been sold to practices in the U.S. to be shocking: we estimate that up to 10 million units of misbranded dental wax are currently in the possession of practices and households in the U.S. alone.

What's more, these labeling deficiencies do not exist in a vacuum, since insufficient labels have implications regarding other public health and safety controls set forth by FDA. In addition to the medical device labeling requirements in the U.S., FDA also oversees a vast Medical Device Reporting ("MDR") program.[6] And although only certain entities have a legal obligation to report medical device problems to FDA, the agency nevertheless urges anyone who comes across such an incident to report the issue: "The FDA encourages healthcare professionals, patients, caregivers and consumers to submit voluntary reports of significant Adverse Events (AE) or product problems with medical products to MedWatch, the FDA's Safety Information and Adverse Event Reporting Program."[7]

But beside the voluntary reporting system, 21 CFR 803 explicitly requires manufacturers of medical devices to report MDR reportable events.[8] As previously discussed however, it is not uncommon for conventional dental wax to be distributed without FDA-compliant labeling. Not only is this a prohibited act in and of itself, FDA's Medical Device Reporting system is also compromised by this practice insofar as it may not be possible for the patient or caregiver to identify and directly contact the manufacturer, who is mandated under FDA regulations to report MDR reportable events.

In cases where the patient is unable to contact the manufacturer of unlabeled dental wax, can we assume then that the orthodontic practice is investigating and submitting adverse event reports to bridge the gap between the patient and the manufacturer? To do so is arguably naïve. Furthermore, suppliers of conventional dental wax in the U.S. do not routinely provide communication or training to orthodontic practices about the importance of serving as a liaison between the manufacturer and the patient in order to properly investigate and file Adverse Events for unlabeled product.

History of Adverse Event (AE) Reporting in the U.S. for Dental Wax

It is estimated that over 100 million packs of dental wax, made by many different manufacturers, have been dispensed to patients in orthodontic treatment since 1996.[1] Yet FDA's Manufacturer and User Facility Device Experience (MAUDE) database shows a dearth of Adverse Events (AEs) for dental wax dispensed to patients since 1996. And while we know much of the conventional dental wax is made outside the U.S., not one AE was filed by a manufacturer outside the U.S. [9]

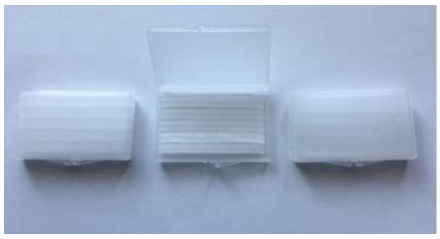
Compared to other high-volume dental devices (which tend to be properly labeled), we have unearthed less than five AEs filed over 23 years for all the dental wax dispensed to patients. For comparative purposes, a search in the MAUDE database returns over 500 AEs for dental floss (with the true number being exponentially larger, since the database search times out at 500 maximum). However, without proper labeling for dental wax products (e.g. identification of the device, name of the manufacturer, and lot number), it is practically infeasible for patients to notify the manufacturer directly of an Adverse Event.

Since the reported number of AEs for conventional dental wax is unusually low, and unlabeled wax products do not offer patients a practicable way of contacting the manufacturers directly, there appears to be a reasonable likelihood that adverse events that are otherwise MDR reportable events have gone unreported. If that is the case, there is clearly a risk to public health and safety that leaves our patients and the orthodontic industry vulnerable.

In order to make strides toward a safer product, the orthodontic industry must be compelled to provide the end patient a product packaged with proper labeling and traceability, as virtually all lawfully distributed oral healthcare products have been doing for decades. Until that occurs, the orthodontic industry will continue to be vulnerable to increased public health risks since such a large percentage of dental wax dispensed to patients globally remains unlabeled.

Medical Device Labeling Requirements in the European Union (EU)

OrVance has received consistent opinions from two global regulatory firms and an Authorized Representative (AR) in the EU, all stating that unlabeled dental wax is in clear violation of MDD 93/42/EEC. To further confirm this, a third party regulatory firm contacted the UK's Medicines and Healthcare products Regulatory Agency ("MHRA") to ask whether the unlabeled conventional dental wax (as depicted in the shared photo below) is in compliance with the current labeling requirements in the EU.



This was the MHRA response:

> *"...the individual devices (wax packets) will be going to an end user and will not be used directly by the healthcare professionals who are supplied the bulk packages. MHRA therefore considers that information required on the label as per Annex I, section 13.3 (of MDD 93/42/EEC) must be provided on the individual devices..."*

Per the MHRA's feedback and the requirements of the current Medical Device Directive, at least the following items must appear on the product:

a. Name and address of manufacturer
b. Name and address of Authorized Representative
c. Identification of the device
d. Lot number

Furthermore, the new EU Medical Device Regulation 2017/745 [page L117/5, paragraph (35)], which goes into effect 26 May 2020, expands the accountability for noncompliance beyond manufacturers to also include importers and Authorized Representatives (AR). Responsibility is also specifically assigned to distributors to inform the manufacturer, AR, and importers if they know or have reason to believe that the device is not in conformity with the regulations.

Understanding that medical device labeling requirements vary by country, but that throughout the EU and elsewhere there is a clear directive to include certain critical pieces of information about the manufacturer and product on the label, it is no longer appropriate for the orthodontic industry to sell and dispense the same unlabeled dental waxes to all patients in treatment globally. We believe conventional dental wax may be one of the last commonly dispensed medical devices for which the industry often fails to offer labeling or product traceability to the end patient. Indeed, the same unlabeled wax is often sold to practices in all markets regardless of local labeling regulations. Exhibit E is one of the several letters (redacted) that were sent to Authorized Representatives in the EU requesting immediate action to discontinue sales of unlabeled dental wax.

Summary & Conclusions

It's time for all orthodontic dental wax to immediately be brought into compliance with regulatory requirements wherever it's sold, and to meet universally accepted healthcare quality and safety standards.

It is not the conclusion of this paper that manufacturers have intentionally suppressed adverse events by selling mislabeled product, but we do conclude this may have been the unintended result. Unlabeled dental wax presents a real public health risk, exacerbated by the fact that adverse events may be going unreported and unrecognized. While evading certain standards and regulations set forth by the E.U. and the FDA in the U.S. has allowed conventional dental wax manufacturers to minimize costs and sell the same unlabeled product anywhere in the world, many of these medical devices are nevertheless unlawful. Whether they are distributed in the U.S. or the E.U., these products must meet certain labeling requirements.

Only by assuring that all conventional dental wax products meet or exceed relevant statutory and regulatory requirements can the orthodontic industry also assure that it would be able to adequately address and otherwise contain a potential significant quality/safety issue or orchestrate a product recall

in the event of any serious safety issue with conventional dental wax. Today, millions of packs of unlabeled dental wax are being used by patients all over the world, but have been distributed in packaging that offers no practicable way for those patients to identify who the manufacturer is for that product. As a result, the quality of all unlabeled dental wax is essentially only as good as the lowest common denominator.

Unlabeled dental wax may be one of the last commonly dispensed Class I medical devices that continues to be distributed in violation of current and upcoming regulations in many countries. So it is the final conclusion here that it's time for the orthodontic industry to make it a priority for the manufacturers to come into conformance worldwide, and address the ubiquitous deficiencies in performance, aesthetics, and quality.

Addressing the obsolescence and noncompliance of dental wax must be led by the suppliers to the orthodontic profession, who are responsible under the law for the compliance of the medical devices they sell to practices. Complacency is not a solution. The responsibility for meeting quality/safety standards and regulatory requirements for medical devices clearly falls on the manufacturers and suppliers – not the orthodontic practices.

For some parting thoughts, we raise the following questions to be considered by the orthodontic industry, patients, parents, consumer/patient advocates, and regulators:

- Should we continue to dismiss the universally accepted general controls and labeling regulations that have now been in place for decades throughout the global healthcare industry?
- How can orthodontic product suppliers collectively defend conventional dental wax as having a safe history when the Medical Device Reporting system in the United States may be compromised by ever-present unlabeled product?
- How would the orthodontic industry mitigate a potential quality or safety issue with unlabeled wax from a given manufacturer? And is the orthodontic profession especially vulnerable if the identification of the manufacturer is impracticable?
- Shouldn't orthodontic practices, orthodontic trade associations, and/or orthodontic resident programs hold suppliers and manufacturers accountable to the same standards followed by manufacturers of other commonly dispensed medical devices?
- What proactive measures should be taken within the orthodontic industry to address these known regulatory violations and noncompliance with current quality and safety standards? Since the new EU Medical Device Regulations that goes into effect on May 26, 2020 expands accountability for regulatory violations, shouldn't the orthodontic industry embrace the need to bring all orthodontic wax into full compliance in both the U.S. and EU no later than that date?
- Does the noncompliance of one of the most commonly dispensed products by the orthodontic profession undermine its claim that patient safety is the profession's top priority?

Dr. Mart McClellan, Orthodontist, Author, and Advisor to OrVance stated, "Scrutiny of our profession is certain to increase if we continue to ignore the noncompliance and poor performance of the most commonly dispensed product in our profession. We need to demand that all suppliers to our profession stop pushing the cheap unlabeled wax on our practices and immediately bring orthodontic wax into full compliance with current quality standards and regulatory requirements."

In our continued research on this topic, we invite all readers to contact us with your feedback. Please send any questions or feedback to Dr. Mike Silver at mike@orvance.com.

AUTHOR BIOS

Michael E. Silver, PhD

Dr. Silver has a PhD in chemistry from Cornell University and is a professor emeritus at Hope College. Mike has over 30 years of experience in academia and working with industry to develop novel materials and intellectual property in the healthcare arena. Mike is also the principal inventor of OrthoDots, an inventor on numerous issued patents, and the co-author of the textbook Introductory Chemistry: Atoms First (Pearson, 5th edition). He currently leads product development, intellectual property, and technical affairs for OrVance LLC in Grand Rapids, Michigan.

H. Carl Jenkins, JD

Since joining the Wood Burditt Group in the spring of 2007, Carl' s practice has been focused on FDA, USDA and EPA regulatory law. Carl's areas of practice include medical devices, drugs, foods and cosmetics. He has worked with numerous companies on premarket notification submissions to FDA for devices (510(k)s); premarket approval submissions to FDA for devices (PMAs); Investigational Device Exemption applications (IDEs); compliance with FDA's OTC drug monographs; NDAs and ANDAs for drugs; compliance with FDA's marketing, promotion and labeling regulations; compliance with FDA's medical device Quality Systems Regulation (QSRs) and current good manufacturing practice requirements for drugs and foods; facility inspections; 483s, Warning Letters and consent decrees; and enforcement action resolution. He received his JD from DePaul University College of Law in Chicago, Illinois in 2006.

Mart G. McClellan, DDS, MS

Dr. McClellan is a practicing orthodontist in Illinois, former President of the Illinois Society of Orthodontists, author, national lecturer, and on the advisory board of OrVance LLC. Mart received his dental degree from Northwestern University and did his orthodontic residency at the University of Michigan. He has written numerous articles for national publications and multiple books. He is also a Charter Member of the Forbes Speakers Group and has spoken all over the country, including numerous universities, and internationally. Mart is also President of Macro Wealth Management, a Registered Investment Advisor (RIA), and is registered in multiple states in the areas of securities and insurance.

Anne Armstrong

Anne has over 25 years of experience in Quality Control/Assurance at the management level in both the manufacturing and retail sides of the business. Anne has designed several Quality Programs for GMP start-up operations and also has an extensive background conducting training and audits to ensure Quality/Compliance, and interpreting/following FDA regulations.

Ronald J. Schutt

Ron has over 25 years of experience in healthcare and previously served as vice president of consumer healthcare marketing at Perrigo Company (NYSE: PRGO), where he championed major healthcare initiatives, product development, and led several of the most successful product launches in the company's history. He is also the founder and principal of RJ Schutt & Associates and serves as the founding president/CEO for OrVance LLC in Grand Rapids, Michigan.

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Exhibit A - Notification OrVance sent to over 30 suppliers in March 2019

NOTICE TO SUPPLIERS OF NONCOMPLIANT DENTAL WAX

Generic dental wax is now believed to be the last healthcare product of its type that does not meet any of the following quality and safety standards: hygienic unit-of-use packaging for safe patient and in-office use, tamper-evident packaging, proper labeling with product traceability, and disclosure of ingredients.[1-3] Sold globally to orthodontic practices and dispensed primarily to children, generic dental wax is also in violation of the European Union Medical Device Directive as confirmed with the United Kingdom Medicines and Healthcare products Regulatory Agency (MHRA), two global regulatory firms, and an EU Authorized Representative. Generic wax's regulatory noncompliance and omission of these basic healthcare product standards leaves our patients and industry vulnerable.

OrVance LLC is partnering with suppliers in the orthodontic industry to provide the first globally compliant orthodontic wax: OrthoDots® CLEAR. Following is a summary on where generic dental wax fails our patients in quality, compliance, performance, and aesthetics relative to OrthoDots® CLEAR.

Quality, Safety, and Compliance Features[1]	Generic Dental Wax	OrthoDots® CLEAR
Hygienic Unit-of-Use Packaging for safe patient and in-office use	NO	YES
Tamper Evident Packaging	NO	YES
Labeling with Product Traceability	NO	YES
Disclosure of Ingredients	NO	YES
Compliant with Regulations in the EU	NO	YES

Performance and Aesthetic Features[2]	Generic Dental Wax	OrthoDots® CLEAR
Sticks and Stays the Best (with proprietary adhesive)	NO	YES
Clear (17X more transparent that dental wax)	NO	YES
20X more pliable than dental wax (easier to mold)	NO	YES
Best for use on all appliances including Clear Aligner Trays	NO	YES

Made in U.S.A. I Patents Pending

In a recent survey of orthodontic residents in the U.S., residents could not identify one other healthcare product with none of the above quality and safety features.[3] In addition, the majority of residents surveyed believe that it is not acceptable to dispense a product to their patients that have none of these features.

OrVance is proud to partner with world-class suppliers including American Orthodontics, G&H, and others that have joined OrVance in actively promoting OrthoDots® CLEAR as the first orthodontic wax that meets global quality and regulatory requirements. With its partners, OrVance will continue to actively educate orthodontists and resident programs on the need to immediately stop dispensing dental wax that is lacking any of the necessary quality and safety features listed above.

Over half of the U.S. graduate resident programs have adopted OrthoDots® CLEAR, which they prefer overwhelmingly to wax, and 88% of the residents surveyed say they intend to use OrthoDots® CLEAR in their practice.[3] OrVance is seeking to expand its partnerships with leading suppliers in the orthodontic industry to provide all patients in treatment access to a higher quality and fully compliant replacement to traditional dental wax. Orthodontic product suppliers that are interested in making OrthoDots® CLEAR available to their customers can contact OrVance at service@orvance.com.

1. OrthoDots® CLEAR: Raising the Bar in Quality, Safety, and Compliance, May 2018
2. Why OrthoDots® CLEAR is Poised to Replace Dental Wax, November 2017
3. OrVance Survey to Orthodontic Residents in the U.S., March 2019

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Exhibit B – Trade Advertisement run in the U.S. and UK in May 2019

INDUSTRY ALERT ON NONCOMPLIANT DENTAL WAX

Did you know that orthodontists are dispensing the last known product in all of healthcare with NONE of the quality and safety features below that patients have come to expect?

Dental wax is still the most commonly dispensed product by orthodontists and 75% of patients are children. Generic dental wax not only falls short of current healthcare product standards, it is also in violation of medical device regulations in the European Union, which leaves our patients and industry vulnerable.

OrthoDots® CLEAR is the world's first globally compliant solution that meets these critical healthcare product standards and offers superior performance and aesthetic benefits.

Quality, Safety, and Compliance Features[1]	Generic Dental Wax	OrthoDots® CLEAR
Hygienic Unit-of-Use Packaging for safe patient and in-office use	NO	YES
Tamper Evident Packaging	NO	YES
Labeling with Product Traceability	NO	YES
Disclosure of Ingredients	NO	YES
Compliant with Regulations in the EU	NO	YES

Traditional dental wax also is obsolete in both performance and aesthetics. OrthoDots® CLEAR is the first orthodontic wax to provide the following benefits for your practice and patients:

Performance and Aesthetic Features[2]	Generic Dental Wax	OrthoDots® CLEAR
Sticks and Stays the Best (with proprietary adhesive)	NO	YES
Clear (17X more transparent that dental wax)	NO	YES
20X more pliable than dental wax (easier to mold)	NO	YES
Best for use on all appliances including Clear Aligner Trays	NO	YES

Made in U.S.A. I Patents Pending

In a recent survey of orthodontic residents in the U.S., a majority of residents surveyed believe it is not acceptable to dispense a dental wax product to their patients without any of the above quality and safety features. OrthoDots® CLEAR is now the #1 orthodontic wax in U.S. orthodontic resident programs with over 80% of the residents surveyed saying they intend to use OrthoDots® CLEAR in their practice.[3]

OrthoDots® CLEAR is also now the only dental wax alternative that is available at leading suppliers and at major retailers in the U.S. for ongoing patient needs.

Ask your favorite supplier for OrthoDots® CLEAR, or learn where to buy at orthodots.com.

1. OrthoDots® CLEAR: Raising the Bar in Quality, Safety, and Compliance, May 2018
2. Why OrthoDots® CLEAR is Poised to Replace Dental Wax, November 2017
3. OrVance Survey to Orthodontic Residents in the U.S., March 2019

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EXHIBIT C – Letter to the American Association of Orthodontics, June 2019

OrVance
INNOVATION IN ORTHODONTICS

June 18, 2019

Lynne Thomas Gordon, Chief Executive Officer
Sean Murphy J.D., Vice President, Advocacy and General Council
American Association of Orthodontists
401 North Lindbergh Boulevard
St. Louis, MO 63141-7816
(Delivered via Email)

Dear Lynne and Sean,

Thank you again for taking the time to review the quality and compliance issues associated with the generic dental wax that is still being dispensed globally to patients in orthodontic treatment. As you requested, this letter provides the specific information around known regulatory violations and the noncompliance with current healthcare quality standards.

As discussed, it is not our request that AAO takes a formal position on this matter. But we do respectfully request that this letter should be made available to all AAO members so they can be made aware of this issue and draw their own conclusions.

In addition to the content of this letter, we would encourage AAO members to read this third party editorial by Alison Werner, Chief Editor at Orthodontic Products titled "*Should a Modern Orthodontic Practice Still Dispense Dental Wax*".

Additionally, as OrVance will soon be extending this PR/awareness campaign to the general media and consumers, we'd suggest AAO members will want to be made aware of the questions that are likely to surface from their patients on this issue. While this new campaign will target the end consumer, it is very consistent with the content of this letter and our advocacy efforts within the orthodontic industry over that last 18 months.

Definitions:
For the purpose of this letter, we define generic or unlabeled dental wax as the typical "wax" composite in connected strips within a plastic case. This dental wax dispensed to the patient has no labeling, no lot codes, and no tamper-evident features. Below is a picture of the typical generic dental wax that is most commonly dispensed to patients globally.

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Below we address four areas in particular where generic dental wax violates commonly accepted healthcare product quality standards as well as clear violations of longstanding regulations in many of the world's leading orthodontic markets: namely unit-of-use/hygienic packaging, tamper-evident packaging, proper labeling with product traceability, and disclosure of ingredients. This letter also addresses the implications of upcoming EU Medical Device Regulations (MDR's) on 26 May 2020, which adds even more stringent requirements for medical devices and expands the scope of liability/accountability for known regulatory violations.

Unit-of-Use Packaging

Since dental wax comes in contact with saliva and even blood, we believe traditional dental wax is not appropriate for patients to repeatedly handle the same piece of composite over and over. Also, it should never be shared among patients — and we know this occasionally happens, particularly with the many children in orthodontic treatment in our schools. We have also encountered known cases where elementary schools have dispensed dental wax to different children from the same pack. And in many instances, schools are receiving these cases of generic wax from local orthodontists to promote their practice in the community.

Safe and convenient use for our patients is the primary reason why we found it essential to package OrthoDots® CLEAR in hygienic, single-use applications. We believe generic wax is the last commonly dispensed healthcare product used for a similar purpose that is not in hygienic single-use packaging. When you stop and think about it, why has it taken so long for a product used for this purpose to be packaged in hygienic applications? It's what we've expected for decades from bandages and all other types of medical devices.

Our research also proves that orthodontic residents are embracing the need for more hygienic packaging. When we surveyed orthodontic residents from dental schools across the U.S., 69% said it was either 'important' or 'very important' that a product used for this purpose is hygienic and in single-use packaging. And the majority of residents surveyed also indicated that the product should be in unit-of-use packaging in order to be used in the practice setting.

Tamper-Evident Packaging

For decades now, virtually all consumable healthcare products have had packaging with a tamper-evident feature. The tamper-evident packaging feature was primarily born out of the Tylenol® tampering incident in 1982 that resulted in seven murders.

According to the regulations of the Food and Drug Administration, a tamper-evident package "is one having one or more indicators or barriers to entry which, if breached or missing, can reasonably be expected to provide visible evidence to consumers that tampering has occurred."

The traditional dental wax that is still commonly dispensed to patients offers no protective barrier or indication whether tampering may have occurred. So we are encouraging leading suppliers and orthodontists to consider whether orthodontic wax should have a tamper evident feature when it's the most commonly dispensed product in our profession, where 75% of our patients are children.

Proper Labeling with Product Traceability

Unlabeled dental wax provides no information or product traceability to the end patient. Certainly for all healthcare products that are put into the mouth, it has become a widely accepted practice in the U.S. and globally decades ago to provide the end consumer product traceability. This global healthcare product standard has also led to the adoption of regulations in the EU over 25 years ago which unlabeled dental wax clearly violates.

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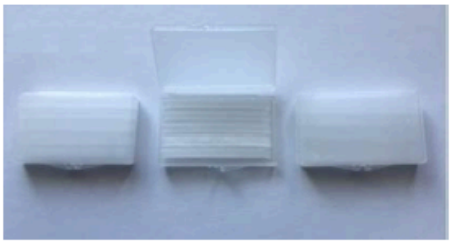
During the development of OrthoDots® CLEAR, OrVance has received consistent opinions from two global regulatory firms and a highly respected Authorized Representative (AR) in the EU stating that unlabeled dental wax is in clear violation of MDD 93/42/EEC. And to further confirm, a third party regulatory firm contacted the UK's MHRA on OrVance's behalf to ask whether the dental wax (as depicted in the shared photo below) is in compliance with regulations in the EU.



This was their response:

> ***"...the individual devices (wax packets) will be going to an end user and will not be used directly by the healthcare professionals who are supplied the bulk packages. MHRA therefore considers that information required on the label as per Annex I, section 13.3 (of MDD 93/42/EEC) must be provided on the individual devices..."***

Per the MHRA's feedback and the requirements of the current Medical Device Directive, at least the following items must appear on the product:

a. Name and address of manufacturer
b. Name and address of Authorized Representative
c. Identification of the device
d. LOT number

Furthermore, the new EU Medical Device Regulation 2017/745 [page L117/5, paragraph (35)] that goes into effect 26 May 2020 expands the accountability for non-compliance beyond manufacturers to also include importers and Authorized Representatives (AR's). Responsibility is also specifically assigned to distributors to inform the manufacturer, AR's, and importers if they know or have reason to believe that the device is not in conformity with the regulations.

<u>Performance, Aesthetics, and Product Costs</u>

While not the primary focus of this letter, generic dental wax is also obsolete in performance and aesthetics. And while OrVance has made substantial investments in the development of a superior performing product with aesthetic benefits, it is important to note that the majority of the incremental cost over traditional wax comes from the added quality and compliance features addressed in this letter. OrthoDots® CLEAR wins on every attribute but it is not viable to compete with the price of generic wax that avoids the costs of meeting these basic quality and regulatory standards.

Therefore, we believe it unfair that OrthoDots® CLEAR must compete on price with a product that avoids the costs of current quality and regulatory requirements. Even putting aside the performance and aesthetic benefits of OrthoDots® CLEAR, is it really worth saving only $1 to $2 per patient to dispense an inferior product that knowingly violates current quality and regulatory requirements?

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In Conclusion

Generic dental wax is in clear violation of longstanding regulations within the EU as well as globally accepted healthcare quality and safety standards. Furthermore, the majority of Orthodontic Residents surveyed said it is not acceptable to dispense an orthodontic wax to patients with none of the features highlighted in this letter. So we'd like to expand the dialog among orthodontists to consider whether traditional dental wax should continue to be the go-to product in our profession for pain and irritation during orthodontic treatment.

Perhaps most importantly, we encourage a dialog between the practice and their suppliers as to why traditional dental wax continues to be sold into our profession when it falls short of today's quality and compliance standards.

Lynne and Sean, we trust this letter provides you with the information you requested so AAO members can be made aware of this emerging issue (more information can also be found at orvance.com). We look forward to hearing from you.

Sincerely Yours,

Ron Schutt
President/CEO, OrVance LLC

Dr. Michael E. Silver, PhD (Chemistry)
Director or R&D and Technical Affairs, OrVance LLC

Eric Hannapel, DDS, MS, PC
Orthodontist & Co-Founder of OrVance LLC

Scott Tyler, DDS, MS
Orthodontist, OrVance Advisory Board Member

Mart McClellan, DDS, MS
Orthodontist, Author, OrVance Advisory Board Member

EXHIBIT D – Legal Opinion Specifying FDA Medical Device Labeling Violations

the WOOD BURDITT group

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www.woodburditt.com

November 13, 2019

Mike Silver, PhD
Director of R&D and Technical Affairs
OrVance LLC
6477 Cherry Meadow Dr SE, Suite 5
Caledonia, MI 49316

Re: U.S. Labeling Requirements for Orthodontic Dental Wax

Dear Dr. Silver,

The Wood Burditt Group counsels manufacturers and marketers of foods, drugs, medical devices, cosmetics, dietary supplements and consumer products. Its compliance and defense counseling is concentrated on the administrative and legal authority exercised by the FDA. Our attorneys have collectively counseled in regulatory law for over 100 years.

This legal and regulatory opinion from the Wood Burditt Group is in response to your inquiry concerning the labeling requirements in the United States for orthodontic dental wax medical devices.

Although some dental wax products are sold over-the-counter at retail, much of the dental wax distributed in the U.S. is through orthodontic practitioners and offices. Dental wax manufacturers often ship boxes of their product to orthodontic offices, and the individual containers being distributed to each patient are in many cases completely unlabeled:

For the following reasons, we conclude that these products are in violation of U.S. law.

Medical devices in the United States are regulated by the Food and Drug Administration (FDA), pursuant to the Federal Food, Drug, and Cosmetic Act ("FD&C Act") and Title 21 of the Code of Federal Regulations. A medical device is defined by the FD&C Act as "an instrument, apparatus, implement … or other similar or related article, including a component part or accessory which is … intended for use in the diagnosis of disease or other conditions, or in the cure, mitigation, treatment, or prevention of disease … or intended to affect the structure or any function of the body … and which does not achieve its primary intended purposes through chemical action within or on the body … and which is not dependent upon being metabolized for the achievement of any of its primary intended purposes." (Sec. 201(h) of the FD&C Act).

Conventional dental wax is intended to be used by orthodontic patients to provide relief from pain and irritation caused by orthodontic appliances, protecting the lining on the patient's cheeks and lips. In the United States, the U.S. Food and Drug Administration defines intraoral dental wax as a "device made of wax intended to construct patterns from which custom made metal dental prostheses, such as crowns and bridges, are cast. In orthodontic dentistry, the device is intended to make a pattern of a patient's bite to make study models of the teeth." (21 CFR 872.6890). Although conventional dental waxes—intended to provide relief from pain and irritation caused by orthodontic appliances—do not exactly fit FDA's regulatory definition of "intraoral dental wax," in practice the agency and industry include conventional dental wax products within the scope of 21 CFR 872.6890 for the sake of FDA registration, listing, etc. Within this regulatory scheme, conventional dental waxes are Class I medical devices under FDA's regulations, and are usually exempt from the current good manufacturing practice requirements of FDA's quality system regulation.

Although these devices are ostensibly exempt from FDA's current good manufacturing practice requirements, such devices are not exempt or otherwise outside the scope of FDA's medical device labeling regulations. Accordingly, conventional dental wax—like all medical devices—must comply with the labeling rules clearly set forth by the FD&C Act, as well as 21 CFR Part 801.

In short, the FD&C Act and FDA's regulations require the "name and place" of the manufacturer, packer or distributor to appear on the label of a medical device, as well as an accurate statement of the quantity of contents. More specifically, 21 CFR 801.1 requires the following: "the label of a device in package form shall specify conspicuously the name and place of business of the manufacturer, packer, or distributor." A device is misbranded if its label does not bear the name and place of business (Sec. 502(b)(1) of the FD&C Act), and/or an accurate statement of the quantity of the contents (Sec. 502(b)(2) of the FD&C Act). These declarations must be conspicuously placed on the label such that they can be read and understood under "customary conditions of purchase and use" (Sec. 502(c) of the FD&C Act). Medical devices that are misbranded or otherwise in violation of the FD&C Act are subject to regulatory enforcement action being initiated by the FDA, including (but not limited to), seizure, injunction, and civil money penalties.

A reasonable interpretation of the medical device labeling provisions in the FD&C Act is that the name and place of manufacturer, packer or distributor, as well as the quantity statement, must be on the container which the patient/consumer/user would see when acquiring the product and when using the product (i.e., "customary conditions of… use"). Indeed, 21 CFR 801.15 states that a statement or other required information may lack the required prominence and conspicuousness for the following reasons:

- If it fails to appear on the part or panel that is displayed under customary conditions of purchase;

- If the package contains sufficient space and the required information fails to appear on two or more panels, each of which is designed to render it to be displayed under customary conditions of purchase;
- Failure to extend required labeling over package space provided;
- Lack of sufficient label space for required labeling due to placement of nonrequired labeling on the package; or
- Smallness or style of type, insufficient contrast between labeling and package background, designs which obscure labeling, or overcrowding of labeling which renders it unreadable.

As is the case with other FDA-regulated articles, such as drugs, the intent of the name and place of manufacturer, packer or distributor labeling declaration rule is to provide patients, consumers and the public with appropriate contact information in case of questions, concerns and adverse events.

In examining the examples of conventional dental wax products and packages that you have provided, we find none of the legally mandated labeling statements to be present. Indeed, we find no labeling at all. Accordingly, we conclude that these products are in prima facie violation of the FD&C Act, as they are all misbranded. We would also advise companies manufacturing or distributing these products that the following are "Prohibited Acts" under Sec. 301 of the FD&C Act:

> *The following acts and the causing thereof are prohibited:*
>
> *(a)The introduction or delivery for introduction into interstate commerce of any ... device ... that is ... misbranded.*
> *(b)The ... misbranding of any ... device ... in interstate commerce.*
> *(c)The receipt in interstate commerce of any ... device... that is ... misbranded, and the delivery or proffered delivery thereof for pay or otherwise.*
> ...
> *(g)The manufacture within any Territory of ... device ... that is ... misbranded.*

And that Sec. 303(a)(1) of the FD&C Act sets forth the following penalties: "*Any person who violates a provision of section 301 shall be imprisoned for not more than one year or fined not more than $1,000, or both.*"

I trust that this responds fully to your inquiry. Please do not hesitate to contact us should you have any further questions or concerns.

Thank you,

H. Carl Jenkins
The Wood Burditt Group

EXHIBIT E – Letter to Authorized Representatives in Europe (redacted)

OrVance
INNOVATION IN ORTHODONTICS

September 27, 2019

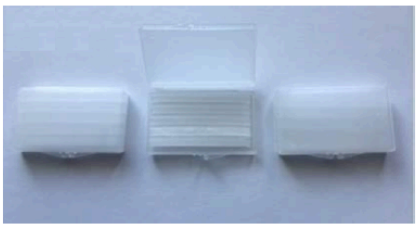
RE: Non-Compliant Dental Wax

To: [redacted]

Dear Sir:

We are the manufacturer of OrthoDots® CLEAR, a modern replacement for intraoral dental wax. As you are acting as the Authorized Representative on behalf of [redacted], [redacted], [redacted], and [redacted], we are informing you that intraoral dental wax from these suppliers is not compliant with current MDD 93/42/EEC, Annex I, Section 13.

OrVance has received consistent opinions from two global regulatory firms and an Authorized Representative (AR) in the EU stating that unlabeled dental wax is in clear violation of MDD 93/42/EEC. To further confirm this, a third party regulatory firm contacted the UK's MHRA to ask whether the generic dental wax (as depicted in the shared photo below) is in compliance with the current labeling requirements in the EU.



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Per the MHRA's feedback and the requirements of the current Medical Device Directive, at least the following items must appear on the product:

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Accordingly, our Authorized Representative has required that the above labeling be present on all individual packs of OrthoDots® CLEAR distributed by orthodontists to their patients throughout the European Union.

Furthermore, the new EU Medical Device Regulation 2017/745 [page L117/5, paragraph (35)] that goes into effect 26 May 2020 expands the accountability for noncompliance beyond manufacturers to also include importers and Authorized Representatives (AR). Responsibility is also specifically assigned to distributors to inform the manufacturer, AR, and importers if they know or have reason to believe that the device is not in conformity with the regulations.

Finally, as shared in the attached white paper, our research with third party experts concluded that the above labeling violations has also resulted in the compromising of Adverse Event Reporting. Additional information on OrthoDots® CLEAR and the quality and compliance issues with generic dental wax can be found in the white papers at orvance.com.

It is our request that [redacted] immediately notify [redacted], [redacted], [redacted], and [redacted] on the above labeling violations and discontinue your role as Authorized Representative for all noncompliant dental wax in the EU no later than May of 2020 when the new MDR goes into effect. We would appreciate acknowledgement of your receipt of this letter and your prompt attention to this matter.

Sincerely,

Michael E. Silver, PhD
Director of R&D and Technical Affairs
OrVance®
Phone: 616-460-7191
Email: mike@orvance.com
www.orvance.com