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## Terminology for a Suspected Pattern of Dental Origin

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## Terminology for a Suspected Pattern of Dental Origin

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410 North 21st Street  
Colorado Springs, CO 80904

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## Foreword

This document presents a compiled set of standardized terms and definitions intended to establish a common language for describing the appropriate terms for a suspected pattern of dental origin. It is important to note that these definitions do not assert a scientific foundation for the terms. Instead, they aim to provide clear and unambiguous descriptions for effective communication within other standards. Including these terms ensures consistent communication of both the application and limitations of these phrases and processes by both the forensic and legal communities.

The American Academy of Forensic Sciences established the Academy Standards Board (ASB) in 2015 with a vision of safeguarding Justice, Integrity and Fairness through Consensus Based American National Standards. To that end, the ASB develops consensus based forensic standards within a framework accredited by the American National Standards Institute (ANSI), and provides training to support those standards. ASB values integrity, scientific rigor, openness, due process, collaboration, excellence, diversity and inclusion. ASB is dedicated to developing and making freely accessible the highest quality documentary forensic science consensus Standards, Guidelines, Best Practices, and Technical Reports in a wide range of forensic science disciplines as a service to forensic practitioners and the legal system.

This document was revised, prepared, and finalized as a standard by the Forensic Odontology Consensus Body of the AAFS Standards Board. A draft of this standard was developed by the Forensic Odontology Subcommittee of the Organization of Scientific Area Committees (OSAC) for Forensic Science.

Questions, comments, and suggestions for the improvement of this document can be sent to AAFS-ASB Secretariat, [asb@aafs.org](mailto:asb@aafs.org) or 401 N 21st Street, Colorado Springs, CO 80904.

All hyperlinks and web addresses shown in this document are current as of the publication date of this standard.

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**Keywords:** *terminology, forensic odontology, patterned injury, human dentition*

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# 1 Terminology for a Suspected Pattern of Dental Origin

## 2 **1 Scope**

3 This technical report provides terms and definitions for describing a suspected pattern impression  
4 of dental origin.

5 This document does not provide information on the criteria for applying these terms to a specific  
6 suspected pattern impression of dental origin.

## 7 **2 Normative References**

8 There are no normative reference documents, Annex B, Bibliography, contains informative  
9 references.

## 10 **3 Terms and Definitions**

11 **Note to Terms and Definitions** The layout of these terms and definitions follows ISO IEC Directives Part 1  
12 and *Consolidated ISO Supplement 2019 (10th Edition) Section 3. Terms and Definitions* recommendations are  
13 listed according to the hierarchy of the concepts (i.e., systematic order) rather than alphabetical order. An  
14 alphabetical listing is available in the index.

### 15 **3.1** 16 **general terms**

17 **3.1.1**  
18 **natural tooth (teeth)**  
19 oral organ consisting of enamel, dentin, cementum, and pulp

20 **Note to entry** Some elements may be missing due to congenital, developmental, or structural modifications.

21 **3.1.2**  
22 **artificial tooth (teeth)**  
23 prosthesis restoring or replacing a natural tooth

24 **3.1.3**  
25 **pattern**  
26 discernable shape, form, or array appearing in or on a substrate

27 **3.1.3.1**  
28 **patterned injury**  
29 injury with a pattern that may reproduce the characteristics of the object causing the injury

30 **3.1.3.2**  
31 **patterned impression**  
32 surface alteration demonstrating the capacity to replicate the characteristics of the object causing  
33 the alteration

- 34 **3.1.4**  
 35 **bitemark/bite mark**  
 36 physical alteration in a substrate caused by the contact of the biting surfaces of a tooth or teeth as a  
 37 result of a closure of the mouth
- 38 **3.1.5**  
 39 **toothmark/tooth mark/teeth mark/teethmark**  
 40 physical alteration in a substrate caused by contact between the substrate and a tooth or teeth that  
 41 is not a result of a closure of the mouth
- 42 **3.1.6**  
 43 **evidentiary value**  
 44 information of sufficient usefulness to serve as the basis for making an empirically significant  
 45 scientific determination.
- 46 **3.1.7**  
 47 **artifact**  
 48 spurious observation anomaly not intrinsically present feature not related to the source
- 49 **3.1.8**  
 50 **suspected pattern of dental origin analysis**  
 51 forensic examination, analysis, and determination of the pattern for potential links to dental origins.
- 52 **3.1.8.1**  
 53 **bitemark assessment analysis**  
 54 forensic examination that a pattern is a bitemark based on the class characteristics of a dentition
- 55 **Note to entry** The purpose of this definition is to describe a process and is not an endorsement of its  
 56 scientific validity.
- 57 **3.1.8.1.1**  
 58 **bitemark analysis**  
 59 forensic examination of class and individual characteristics of a bitemark
- 60 **Note to entry** The purpose of this definition is to describe a process and is not an endorsement of its  
 61 scientific validity.
- 62 **3.1.8.1.1.1**  
 63 **bitemark comparison analysis**  
 64 forensic examination involving comparison of a bitemark to dentitions
- 65 **Note to entry** The purpose of this definition is to describe a process and is not an endorsement of its scientific  
 66 validity.
- 67 **3.1.8.1.1.1.1**  
 68 **bitemark individualization analysis**  
 69 **<deprecated>**  
 70 forensic examination that identifies an individual with a specific pattern through recognition,  
 71 analysis, and comparison of a bitemark

- 72 **Note 1 to entry** The purpose of this definition is to describe a process and is not an endorsement of its  
 73 scientific validity.
- 74 **Note 2 to entry** While the deprecated term involves visual comparison, other methods, such as DNA analysis,  
 75 can also be utilized; thus, specifying the individualization method used is crucial for clarity.
- 76 **3.2**  
 77 **class characteristic (of the pattern)**  
 78 feature that distinguishes items between categories
- 79 **3.2.1**  
 80 **pattern landmark**  
 81 reference feature in the pattern
- 82 **3.2.1.1**  
 83 **cusp mark**  
 84 pattern left by the most protruding portion of the tooth
- 85 **3.2.2**  
 86 **pattern shape**  
 87 outline of a pattern
- 88 **Note to entry** Suggested terms for shape are included in Table A-1 - Suggested Terms for Pattern Shape
- 89 **3.2.3**  
 90 **pattern color (multiple iterations allowed)**  
 91 hue, chroma, and value of a pattern
- 92 **Note to entry** Suggested terms for color are included in Table A-3 - Suggested Terms for Describing the Color  
 93 of a Patterned Injury
- 94 **3.2.4**  
 95 **pattern metrics**  
 96 quantitative measurement of the characteristics of the pattern
- 97 **3.2.4.1**  
 98 **circumferential distance**  
 99 curvilinear measurement between two points
- 100 **3.2.4.2**  
 101 **linear distance**  
 102 the shortest measurement between two points
- 103 **Note to entry** measurement may need to account that pattern occurred on a curved plane
- 104 **3.2.4.3**  
 105 **intercuspal distance**  
 106 linear measurement between cuspal eminences of the same arch

- 107 **3.2.5**  
 108 **arch characteristic (of the pattern)**  
 109 curved composite structure of the dentition in a jaw
- 110 **3.2.5.1**  
 111 **arch size**  
 112 defined linear or curvilinear distance between two landmarks on the same jaw
- 113 **3.2.5.2**  
 114 **maximum interarch distance**  
 115 individual's greatest achievable opening distance between two landmarks on opposing jaws
- 116 **3.2.5.3**  
 117 **dental midline**  
 118 line drawn between the central incisors of a dental arch
- 119 **3.2.5.4**  
 120 **arch midline**  
 121 line bisecting an alveolar process
- 122 **Note to entry** In the maxillary arch it typically passes through the incisive foramen
- 123 **3.2.5.5**  
 124 **arch orientation**  
 125 positional relationship of the arch to a fixed landmark
- 126 **3.3**  
 127 **individual characteristic (within the pattern)**  
 128 distinguishing feature within a *class characteristic*
- 129 **3.3.1**  
 130 **diastema**  
 131 interdental space between two adjacent teeth that would typically be in contact with each other
- 132 **3.3.2**  
 133 **incisal edge shape (by tooth)**  
 134 area outline of the incisal edge of a tooth
- 135 **Note to entry** Suggested terms are included in Table A-2 - Suggested Terms for Describing the Incisal Edge  
 136 Shape
- 137 **3.3.3**  
 138 **incisal edge metrics (by tooth)**  
 139 quantitative assessment of the incisal edge of a tooth
- 140 **3.3.3.1**  
 141 **incisal edge angulation**  
 142 angle formed between the incisal edge of a tooth and a reference
- 143 **Note to entry** Commonly, the reference is the incisal edge of an adjacent tooth



144	<b>3.4</b>
145	<b>substrate</b>
146	surface or surfaces on which a pattern appears
147	<b>3.4.1</b>
148	<b>biological substrate</b>
149	tissue upon which the pattern was impressed
150	<b>3.4.1.1</b>
151	<b>fixed substrate</b>
152	substrate firmly attached to underlying structures
153	<b>3.4.1.2</b>
154	<b>mobile substrate</b>
155	substrate not firmly attached to underlying structures
156	<b>3.4.1.3</b>
157	<b>substrate elasticity</b>
158	substrate ability to resume its resting position
159	<b>3.4.2</b>
160	<b>non-biological substrate</b>
161	inanimate object upon which the pattern was impressed
162	<b>3.5</b>
163	<b>injury</b>
164	damage to a biological organism caused by physical harm (ISO 19434:2017(en), 315)
165	<b>3.5.1</b>
166	<b>patterned injury characteristics</b>
167	features or qualities belonging to the <i>patterned injury</i>
168	<b>3.5.1.1</b>
169	<b>abrasion</b>
170	superficial scraping of the substrate
171	<b>3.5.1.2</b>
172	<b>ecchymosis</b>
173	extravasation of blood that causes a temporary discoloration of the skin
174	<b>3.5.1.2.1</b>
175	<b>bruise</b>
176	<i>ecchymosis</i> (3.5.1.2) from a tissue injury
177	<b>3.5.1.2.1.1</b>
178	<b>contusion</b>
179	<i>bruise</i> (3.5.1.2.1) from blunt trauma
180	<b>3.5.1.3</b>
181	<b>laceration</b>
182	soft tissue tear or break

- 183 **3.5.1.4**  
184 **petechial hemorrhage**  
185 pinpoint intradermal hemorrhages beneath the skin
- 186 **3.5.1.5**  
187 **avulsion**  
188 tearing away of an attached or anchored tissue
- 189 **3.5.1.6**  
190 **incision**  
191 cut in tissue made with a sharp object
- 192 **3.5.1.7**  
193 **indentation**  
194 recess on a surface
- 195 **3.5.1.8**  
196 **drag marks**  
197 abrasion injury induced by motion
- 198 **3.5.1.9**  
199 **unknown**  
200 undefined pathology
- 201 **3.5.2**  
202 **anatomical location (biological substrates)**  
203 site of the pattern.

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**Annex A**  
 (informative)

**Suggested Terms**

The tables in this annex provide the suggested terms that may be used in conjunction with the terms/definitions in this document.

**Table A-1—Suggested Terms for Pattern Shape**

round
ovoid
curvilinear
diamond
rectangular
irregular
indeterminant

**Note to entry** indeterminant - unable to assign a definitive term to the pattern shape

**Table A-2— Suggested Terms for Describing the Incisal Edge Shape of an Anterior Tooth**

rectangular
circular
oval
triangular
indeterminant

**Note 1 to entry** An individual pattern must be recognized as a tooth before assigning an edge shape.

**Note 2 to entry** indeterminant - unable to assign a definitive term to the shape of the incisal edge

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**Table A-3—Suggested Terms for Describing the Color of a Pattern (Biological)**

red
violet
reddish purple
bluish purple
purple
blue
violet
green
dark yellow
pale yellow
brown
black
white
multiple colors
indeterminant
unknown

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220

221 **Note 1 to entry** indeterminant - unable to definitively assign a color to the pattern due to imprecise color  
 222 information.

223 **Note 2 to entry** unknown - unable to definitively assign a color to the pattern due to lack of color  
 224 information

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## Annex B (informative)

### Bibliography

The following bibliography is not intended to be an all-inclusive list, review, or literature endorsement on this topic. The goal of the bibliography is to provide examples of publications addressed in the standard.

- 1] American Board of Forensic Odontology, Diplomates Reference Manual.<sup>a</sup>
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- 8] Wheeler's Dental Anatomy, Physiology, and Occlusion, SJ, Nelson, M Ash Jr., 9th ed., Saunders, Elsevier, St. Louis, Missouri, 2010.

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<sup>a</sup> Available from: <http://abfo.org/resources/abfo-manual/>

<sup>b</sup> Available from: <https://www.iso.org/obp/ui/>

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