<u>**WG ERO-FDI: Recommendation Material for the Use of AI in Dentistry**</u>

<u>**(Position paper)**</u>

Introduction: The following recommendation material aims to provide guidelines for using Artificial Intelligence (AI) appropriately in dentistry. AI can enhance diagnostic accuracy, treatment planning, and patient care. However, it is essential to establish ethical and legal frameworks to ensure the responsible and safe implementation of AI technologies in dentistry. This material aims to address critical considerations for using AI in dentistry and protect the rights and well-being of patients. FDI Science Committee works on definitions and comprehensive materials on this topic. This material summarizes critical regulatory points for setting processes in dental offices and for political negotiations at the national level.

1. Data Privacy and Security:

a. Dentists and dental practices must comply with existing data protection regulations, such as the General Data Protection Regulation (GDPR) or other applicable local regulations.

b. Patient data in AI systems must be anonymized and stored securely to protect patient privacy.

c. Dental professionals must obtain informed consent from patients to collect, store, and use their data in AI systems.

2. Transparency and Explainability:

a. AI algorithms used in dentistry should be transparent about the decision-making process

b. Dentists and dental professionals must understand the underlying decision-making process and ensure they are clinically validated and peer-reviewed.

c. Using "black-box"[1] AI systems, where the decision-making process cannot be explained, should be avoided or used cautiously.

d. Dentists must inform a patient about AI's use in treatment and explain the procedure according to the patient's abilities and knowledge.

e. Dentist must reveal possible business ties including the brand behind AI.

3. **Professional Responsibility and Liability:**

a. Dentists remain accountable for the decisions and treatments provided, even when assisted by AI systems.

b. Dentists must be trained and competent to interpret and validate AI-generated recommendations.

c. Liability for any adverse outcomes resulting from AI-generated recommendations should be appropriately assigned, considering the responsibilities of the dentist towards the patient.

4. **Ethical Considerations:**

a. The use of AI in dentistry should adhere to ethical principles, including non-maleficence, beneficence, autonomy, and justice.

b. AI algorithms should not be biased and should be developed with diverse patient populations in mind.

c. The potential for AI to replace human interaction should be carefully considered, ensuring that patient trust and autonomy are maintained.

5. **Regulation and Oversight:**

a. National regulatory bodies and professional organizations should establish guidelines and standards for using of AI in dentistry.

b. Humans should conduct regular audits and evaluations of AI systems to ensure compliance with regulations and ethical standards.

c. Collaboration between dental professionals, AI developers, and regulatory bodies should be encouraged to promote responsible and safe use of AI in dentistry.

6. Continual Professional Development:

a. Educational programs and training should be provided to dental professionals to develop the necessary skills to understand and utilize AI systems effectively and ethically.

b. Education must involve all dental team members according to their professional responsibility.

c. Dental professionals should engage in continual professional development to stay updated with the latest advancements in AI and related ethical and legal considerations.

Conclusion: The recommendation outlined above serves as a starting point for governing the use of AI in dentistry. It is essential to balance the potential benefits of AI with patient safety, privacy, and ethical considerations. By following these guidelines, dental professionals can ensure that they use AI responsibly to enhance patient care while upholding professional and ethical standards.

[1] *Black box AI is any artificial intelligence system whose inputs and operations aren't visible to the user or another interested party. A black box, in a general sense, is an impenetrable system. Black box AI models arrive at conclusions or decisions without providing any explanations as to how they were reached.*