

## Position Summary

Applications of Artificial Intelligence in dentistry should prioritise patient safety, quality of care, continuity of care, and data privacy and security.

## 1. Background

- 1.1. Artificial Intelligence (AI) concepts and Machine Learning (ML) methods are being increasingly applied to optimise dental service delivery.
- 1.2. The introduction of AI and ML systems in dentistry will have significant impacts on patient care. AI and ML have the potential to lower barriers for timely and equitable access to oral healthcare, increase oral health **awareness**, support clinical decision making and increase treatment compliance. Properly trained and deployed, AI systems can facilitate improved health outcomes in the community at the patient, practice, and public health level.
- 1.3. Predictive AI has the potential to be applied, and in some cases has already been developed, for use in the following areas:
  - Intelligent diagnosis of radiographs and photographs
  - Intelligent charting and treatment planning
  - Treatment planning and assistance
  - Progress tracking, such as remote patient monitoring
  - Increasing practice efficiency and business analytics
  - Insurance claim analysis; and
  - Health outcome prediction, such as for public health analysis.
  - Generative AI has the potential to transform information management and communication in dentistry.
- 1.4. The application of AI and ML carries distinct safety considerations depending on stakeholder groups, such as the following:
  - Patients using dental AI directly without support of a dental practitioner
  - Dental practitioners using dental AI at the patient or practice level
  - Other stakeholders such as software vendors, insurance companies, and the public health sector using dental AI.
  - Any individual whose data may have been used to train, inform, or prompt an AI system, may have privacy and security concerns about the access and storage of their data.
- 1.5. Without appropriate transparency and governance, potential consequences of misuse of Predictive AI systems include adverse clinical, financial, and/or reputational outcomes, data privacy and security breaches, misuse of time and resources, unintended discrimination, and loss of trust in healthcare professionals and organisations.

- 1.6. Without careful selection of use cases, potential consequences of misuse of Generative AI include consequences related to Predictive AI, but on an exponentially larger scale, due to the decreased barrier for entry and global accessibility of Generative AI. Generative AI systems such as ChatGPT can authoritatively and convincingly produce false, inappropriate, and dangerous content, often without the ability for verification or validation. If Generative AI systems are used in clinical decision-making by laypersons, or for clinical decision-making at scale, action taken based on unverifiable responses has the potential to cause patients harm.

## Definitions

- 1.7. ARTIFICIAL INTELLIGENCE (AI) is the concept of computer systems being able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.
- 1.8. MACHINE LEARNING (ML) is a data science technique used to extract patterns from data, allowing computers to identify related data and forecast future outcomes, behaviours, and trends. ML is considered a subset of AI, which gives computers the ability to learn from and improve with experience, without being explicitly programmed.
- 1.9. AI SYSTEM is the use of information technology using AI concepts and/or ML methods for the provision of dental services such as consultations, treatment, education, practice management, health data analysis and public health.
- 1.10. PREDICTIVE AI is a type of AI system that uses machine learning algorithms to predict future events or outcomes based on historical data and activity, deployed in specific use cases.
- 1.11. GENERATIVE AI is a type of AI system that has been trained with deep learning algorithms to identify patterns in large datasets. When prompted, it uses this learning to create new and unique content, in the form of text, images or other media.
- 1.12. BOARD is the Dental Board of Australia.
- 1.13. DENTAL PRACTITIONER is a person registered by the Board to provide dental care.

## 2. Position

- 2.1. Patient safety must be the primary consideration for any dental AI system.
- 2.2. Any application of an AI system in dental clinical care must be supervised and managed by a Dental Practitioner and not be actioned autonomously by patients.
- 2.3. The extent of the contribution of an AI system in dental clinical decision making should be clearly recognised and understood by Dental Practitioners and patients.
- 2.4. A decision to action an AI system's result should only be made by a Dental Practitioner taking into account a patient's clinical presentation, including history, examination and relevant tests.
- 2.5. Any dental AI system use should be beneficial and yield outcomes match or exceed the currently accepted clinical standard of care.
- 2.6. The AI system's efficacy should be demonstrated by reliable data obtained from the relevant clinical domain.
- 2.7. Development of, and use of AI in dentistry should adhere to the concept of responsible AI. Model training and interpretation of data from dental AI should involve input from dentists, with ongoing emphasis on risk management and accountability.
- 2.8. Any data should be obtained with appropriate permissions, privacy controls, checked for accuracy and

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relevance, only used for the stated purpose, and stored securely as per the OAIC guidelines.<sup>1</sup>

- 2.9. Data should be collected, interpreted and used in AI systems in a way which minimises bias, to fit community and healthcare expectations, taking into account established and accepted ethical norms, and patient circumstances.
- 2.10. An AI system should not be used by a Dental Practitioner as a substitute for collaboration with clinical colleagues where appropriate.
- 2.11. The known limitations of an AI system in clinical decision making should be clearly recognised and understood by Dental Practitioners and patients.
- 2.12. A clinical practice or company using or developing an AI system for patient care applications must have accountable independent governance to oversee implementation and monitoring of the system's performance such that it matches or exceeds currently accepted ethical and healthcare standards.
- 2.13. The use of Generative AI in dentistry should be limited to low-risk applications, where its output can and will be verified by a Dental Practitioner or auxiliary staff member, such as in the generation of clinical notes, reports and letters, and summarising notes and reports for patient communication. It should not be used wholly and autonomously for clinical decision-making.
- 2.14. Dental Practitioners should educate patients on the risks of prompting Generative AI systems for clinical diagnoses and treatment recommendations.
- 2.15. The field of AI and ML in dentistry is rapidly developing and will require ongoing assessment and independent governance.
- 2.16. Manufacturing companies should assume a level of responsibility for the data and information that is provided by these AI products.
- 2.17. Third parties should not use AI, and information obtained by AI, to attempt to influence the ability of a patient to access appropriate dental care.

#### **Policy Statement 6.34**

Adopted by ADA Federal Council, November 20, 2020.

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<sup>1</sup> OAIC Guidelines which can be found at [www.oaic.gov.au](http://www.oaic.gov.au)

