This document contains a snapshot into the new world of artificial intelligence and its implications in the field of dentistry, including the scientific and statistical reasoning and its role in health ethics. While new technology can be challenging to implement considering the lack of autonomy and creativity that goes along with it, this poster will provide insight into its applications and the positive and negative outcomes of its use in dental offices.

**Abstract**

This topic is of interest to me because I have been exposed to the use of AI in dentistry at the dental practice I work at. The use of CAD/CAM machines and CAO/CAM technology is heavily implemented when creating crowns and bridges to eliminate the use of messy impression material. The patient database we use also incorporates AI into its ray-digital images, as shown in the graph on the right. It knows measurements, suggests treatment plans, and even gives X-rays on the spot. This technology is only going to become more prominent as we go through dental school and become a dentist. It is of interest to me mostly because I will have to choose how much I implement as the dentist and patient will have to trust me to assess its advantages and drawbacks and decide if it will benefit my practice and patients or not.

Relating to ethics, some AI ethics might not be considered ethical if they completely replace the doctor, and instead the AI will make the decisions. Scientific and statistical reasoning plays a role in the same as to have great ability to process and compare vast databases with incredible speed and accuracy. All technologies will help providers make confident measurements and cultivate precise dental crowns, implants, and prosthetic devices in the blink of an eye.

**Lit Review and Analysis**

**Some uses of AI in the field of dentistry**

1. Diagnostic and treatment: AI algorithms can assist with diagnosing and examining patient dental records. This can support dentists in making accurate diagnoses and propose personalized treatment plans (Nissinoff, 2022).
2. Use of CAD/CAM technology to cultivate dental crowns, implants, bridges, dentures, etc. Utilizing complex measurements and algorithms to create aesthetically pleasing dental prosthetic devices (Miladinović, 2023).
3. Implementation of AI into their ray features that assist dentists in making more informed decisions and improve image interpretation procedures (see figure 4) (Nissinoff, 2023; Chen, 2022).

**Benefits of AI in dental practice**

- The utilization of AI-based tools could expedite diagnostic processes and assist dentists in a convenient access to medical and dental history information, essential for tailored patient approaches which is essential for managing patients with complex medical histories (Babenko, 2023). AI can also be used to improve diagnostic efficiency by gathering vast amounts of data to build a database (Babović, 2023).
- Improved diagnostic confidence, time reduction, personalized and evidence-based disease management (Apetel, 2022).

**Ethical considerations connected to AI and its effects on patients**

- AI should be utilized in dentistry if it contributes to the quality of oral and systemic health, while also being cost-effective (Roganvock, 2023).
- Both the patient and the dentist will need to come to a conclusion whether the basic cases of action should include the utilization of AI-based tools (Roganvock, 2023).
- Complete transparency regarding the procedure and how the benefits of using AI outweigh the benefits of not using AI (Chen, 2022).

**Statement of Interests**

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**References**


**Implications, next steps, and questions**

Implications:
- The findings of the studies that have been conducted so far to investigate the use of AI in clinical medicine and dentistry indicate that while there are some very promising futures for this most advanced area of computer usage in healthcare, many more intense research and advancements in the field are needed. To develop high-quality automation systems for the development of novel medications and therapeutic approaches, a significant and robust body of research is required.

Next Steps:
- To map the early rewards of this future technology, research must be as closely aligned with clinical practice as feasible. Every patient’s medical record should be digitally saved, properly processed, and prepared so that AI algorithms can examine it.

Questions for consideration:
- What potential risks or limitations could be associated with having a dental practice that heavily uses AI?
- How can the success of AI to be measured to continue its benefits over its drawbacks?
- What data privacy and security measures are necessary when working with AI systems to prevent exploitation against HIPAA procedures and keep patients’ information private?