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Title: Att.8 – Presentation - AI based software for dentistry - a brief market overview

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Abstract: This PPT contains a presentation on AI based software for dentistry - a brief market overview, given in the AI for Dentistry Symposium on 21 March 2023.

AI in dentistry

A brief market overview

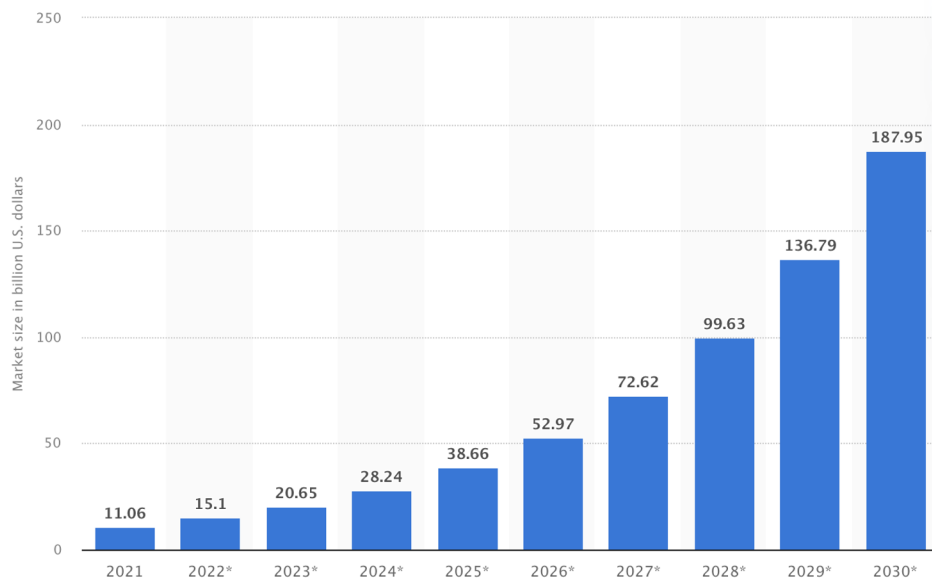
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21st of March 2023 | Dr Janet Brinz



AI in healthcare market

Forecast



[2]

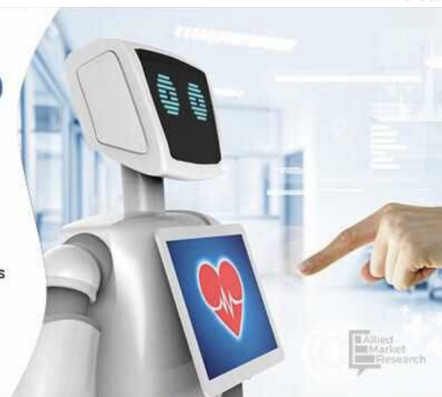
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ARTIFICIAL INTELLIGENCE (AI) IN HEALTHCARE Market

OPPORTUNITIES AND FORECAST, 2021-2030

Artificial Intelligence (AI) in Healthcare Market is expected to reach **194.14 Billion** by 2030.

Growing at a **CAGR of 38.1%** (2021-2030)



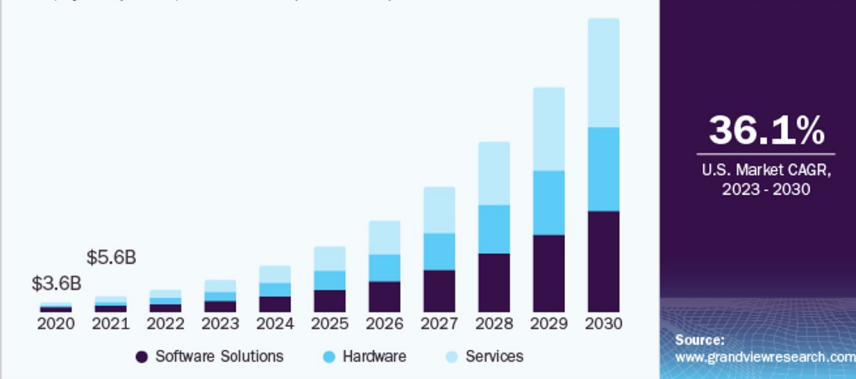
[3]

Artificial Intelligence in Healthcare Market Report Scope

Report Attribute	Details
Market size value in 2023	USD 22.4 billion
Revenue forecast in 2030	USD 208.2 billion
Growth Rate	CAGR of 37.5% from 2023 to 2030

[1]

U.S. Artificial Intelligence In Healthcare Market size, by component, 2020 - 2030 (USD Billion)



[1]

Rapid growth and development of the market
 -> **increase** in the number of players and **products**

Introduction to the AI in Dentistry market

North America:

- Overjet (USA)
- Diagnocat (USA)
- Pearl (USA)
- Videa (USA)
- Adravisio (USA)
- Velmeni (USA)
- Dentistry.ai (USA)
- Denti.ai (Canada)
- TSV tooth secret view (Canada)

Europe:

- AssistDent by Manchester Imaging Limited (United Kingdom)
- Allisone (France)
- Cellmatiq (Germany)
- Dentalxrai (Germany)
- Densilia (Germany)
- Dentomo (Spain)
- Promaton (Netherlands)
- vistaSoft by Dürer Dental (Germany)

Asia:

- Orca, Ceph X (Israel)
- Ivory.ai (India)
- Deep care (China)



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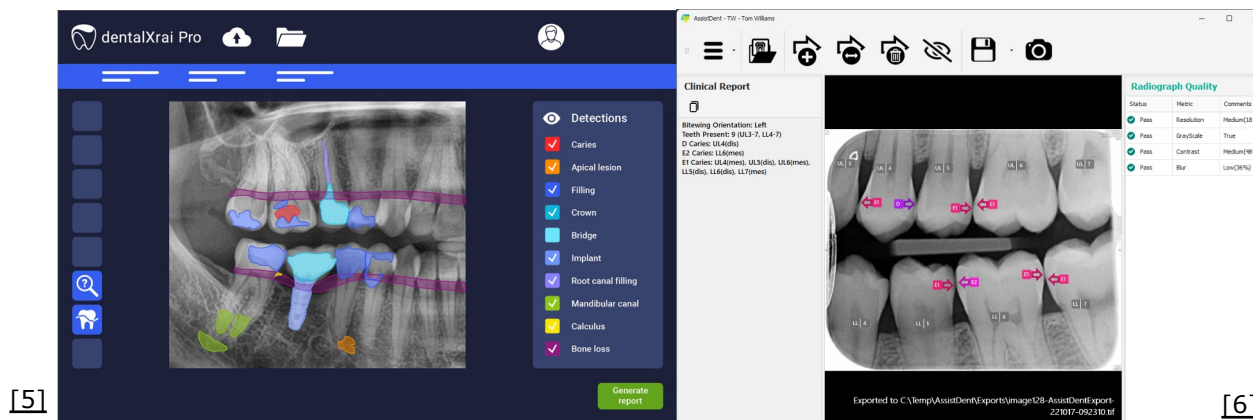
Australia:

- Eyes of AI (Australia)

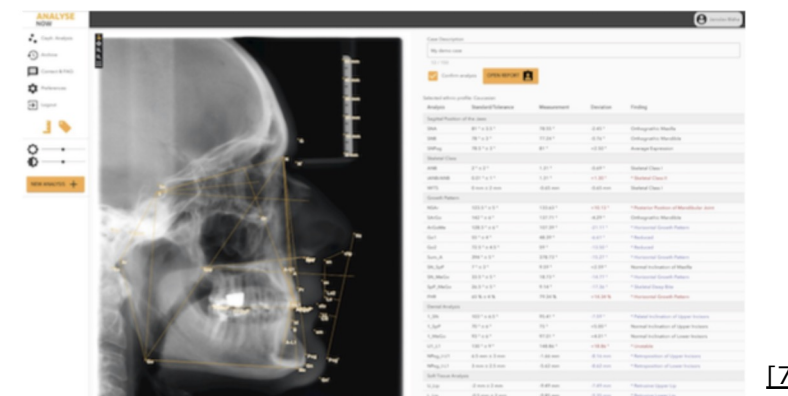
These are just the companies focusing on X-Ray diagnostics!

Segments of AI in dentistry

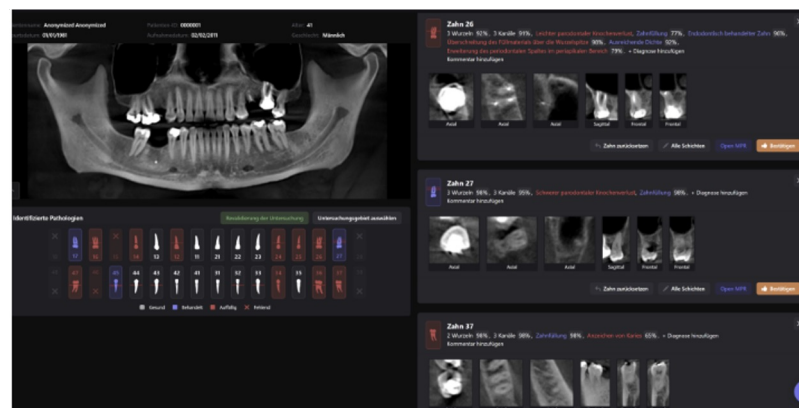
X-ray analysis



Intraoral films, panoramic –
Conservative dentistry, periodontology, endodontics



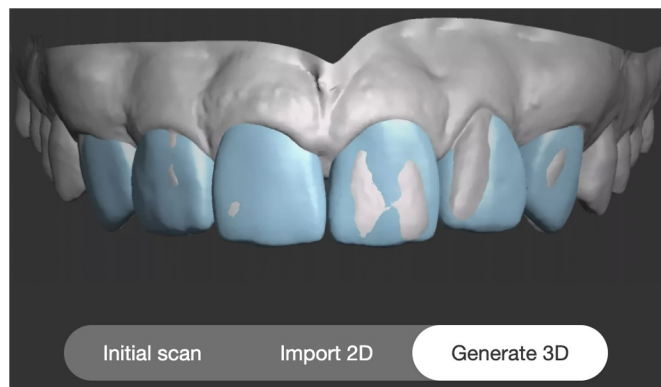
Cephalometric analysis -
Orthodontics



CBCT –
Oral surgery + orthodontics

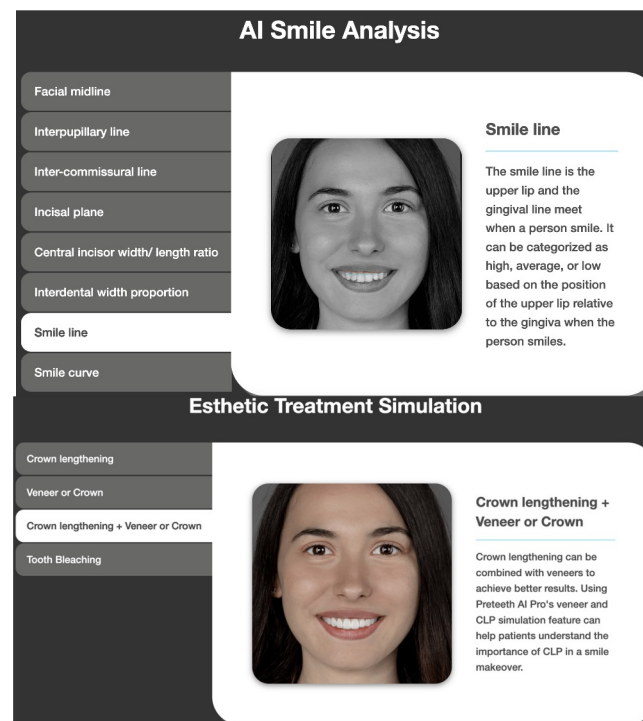
Segments of AI in dentistry

Esthetic dentistry



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AI generated Wax up



[10]

Smile analysis and treatment simulation

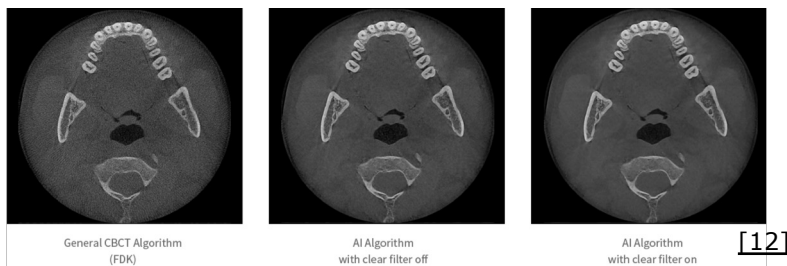


[11]

AI generated cosmetic smile simulation

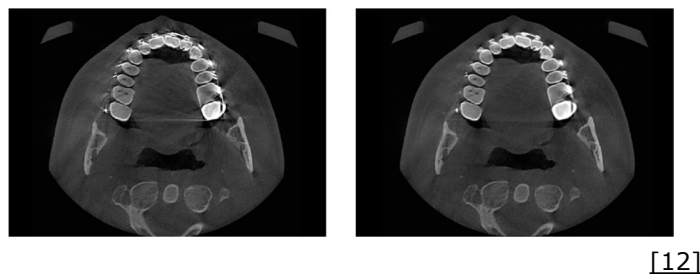
Segments of AI in dentistry

Other applications



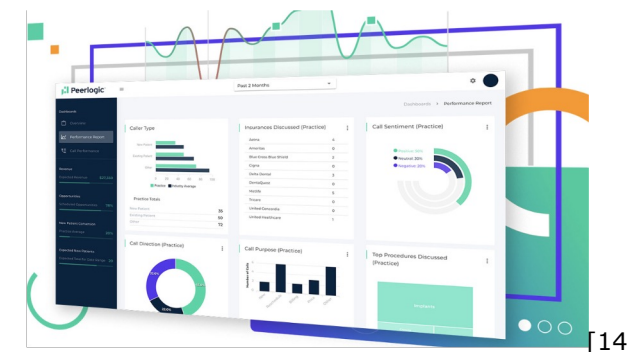
Low dose CBCT Scan with AI enhanced Image Quality

Reduction of metal artifacts



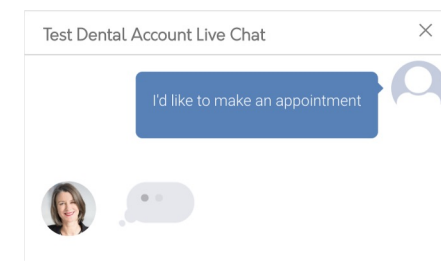
CBCT analysis for aligner treatment

AI assisted practice/ patient management



Analysis of call data (speech) and AI Analytics

Chat on website to answer FAQs, schedule appointments



Capabilities of AI in dentistry

- How do dentists **benefit** from this software?: decrease workload, increase accuracy, enhance patient experience
- What most can do: Segmentation, **Caries** detection, Detection of dental restorations/ treatments (Root canal, Filling, Crown, Bridge, Implant), Calculus detection, Periapical radiolucency detection, treatment plan suggestions
- Where do they differ? Pricing, Performance/ accuracy (different datasets, different algorithms), integration with other systems (e.g. CBCT), user interface, medical/ FDA clearances

Company	Product	Status	Company	Product	Status
Overjet, Inc.	Overjet Dental Assist, Overjet Caries Assist, Overjet Calculus Assist	FDA cleared (510 (k))	adravision	5Handed	ISO 13485 certification, undergoing regulatory clearance in a few countries
Pearl Inc.	Second Opinion	FDA cleared (510 (k))	Velmeni	Second Dentist	currently under FDA approval review
VideaHealth, Inc	Videa Caries Assist, Videa Perio Assist	FDA cleared (510 (k))	Manchester Imaging Limited	AssistDent	UKCE marked medical device, pursuing EU MDR
3D Smile USA, Inc	3D Predict	FDA cleared (510 (k))	CellmatiQ	DentaliQ ortho	EU / CE certified MDD class 1 medical device
HDX WILL Corp.	eco-x Series	FDA cleared (510 (k))			
Denti.AI Technology Inc.	Denti.AI Auto-Chart	FDA cleared (510 (k))	dentalXrai	dentalXrai Pro 3.0	certified as a medical device

Regulation of medical devices

FDA Regulatory Framework

- AI based Software (e.g. caries detection) classifies as Software as Medical Device (**SaMD**)
- Medical devices are classified into different categories based on their risk level – Class II – medium risk
- Medical devices need to be **evaluated by authorities** (such as FDA) before they can be placed on the market to ensure **safety and efficacy**
- As of now only **locked algorithms** have been approved
- Adaptive algorithms not yet approved by the FDA, as current regulatory pathways do not allow for approval of a device that constantly improves itself
- FDA is working on developing a framework for regulating adaptive algorithms

	Locked Algorithm	Adaptive Algorithm
Definition	Always produces the same result unless updated by the developer	Can update itself based on new data
ML Algorithm	Static	Continuous Learning
Advantages	Less risky, predictable results	Can potentially become more accurate over time
Challenges	May become less accurate as real-world data differs from training data	May infer patterns from biased practices or underperform in small subgroups of patients

Future Trajectory

Opportunities and Challenges

- Trajectory and future of AI in dentistry companies dependent on: market demand, technological innovation, regulatory environment, ethical issues, and social acceptance
- **Opportunities:**
 1. Growing demand for AI-powered dental solutions
 2. Increase in investment and research in the field of AI in dentistry
 3. Expansion of AI-powered products in various segments of dentistry
 4. Development of more advanced AI algorithms and technologies
- **Challenges:**
 1. Regulation and approval processes for AI-powered dental solutions can be lengthy and complicated
 2. High initial investment for implementing AI technology in dental practices
 3. Concerns about data privacy and security of patient information
 4. Need for continuous improvement and updates in technology to keep up with advancing competition

Conclusion

AI in Dentistry market

- AI in dentistry is a rapidly **growing** field with numerous **opportunities** and challenges
- There are many players offering a variety of products and services in the current market, which require **regulation**
- It is important to monitor and research the market to understand the opportunities and challenges in the industry
- Overcoming challenges may require **collaboration** between researchers, developers, regulators and professionals



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AI generated image:
Dental practices of the future?

DALL-E prompt:
futuristic AI assisted high tech dental practice

Thank you

For your attention

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Sources

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