EUROPEAN REGIONAL ORGANIZATION
OF THE FEDERATION DENTAIRE INTERNATIONALE FDI

WG Digitalisation in Dentistry- E-Health- Artificial Intelligence (WG DD,eH,AI)

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Sydney Meeting September 2023

SURVEY	Definition of digital dentistry?	SUMMARY	Armenia	Azerbaijan	Belgium - CMD	Belgium - Leuven	Croatia	Cyprus	Czech Republic	Estonia	Germany - Berlin	Germany - Greifswald	Italy - Brescia	Italy - Firenze	Kazakhstan	Kosovo	Kyrgyzstan	Latvia	Latvia - Riga	Lebanon - Beirut Arab University	Lithuania	Luxembourg	Netherland - ACTA	Netherland - Radboudumc	Poland - Bialystok	Poland - Gdansk	Poland - Lodz	Poland - Lublin	Poland - Poznan	Poland - Wroclaw	Poland - Zabrze	Portugal - Lisboa	Romania - Carol Davila Univ. of Medicine and Pharmacy	Romania	Spain - Universidad Cardenal Herrera	Sweden	Turkey	United Kingdom - Bristol	United Kingdom - Plymouth	United Kingdom - Sheffield	United Kingdom - Scotland - Aberdeen	United Kingdom - Wales - Cardiff
	No. of responses:	40																																								
1	**Please choose the most suitable answer concerning the place of education in digital dentistry in your school**																																								
a	Education in digital dentistry is included in current curriculum and taught as a separate subject	3																					x							x						x					
b	Education in digital dentistry is included in current curriculum but the effects of learning are included in different subjects	34	x	x	x	x	x	x	x	x	x	x	x	x	x			x	x	x	x			x	x	x	x	x	x		x	x	x	x	x		x	x	x	x	x
c	There is no education in digital dentistry delivered but there are plans to include it in the curriculum	2														x	x																									
d	There is no education in digital dentistry delivered and there are no plans to include it in the curriculum	0																																								
2	**How many hours in the curriculum are dedicated to digital dentistry education**																																									
a	Less than 10	6					x								x																			x	x			x				x
b	10 to 19	9						x	x							x		x		x					x		x				x					x						
c	20 to 29	11	x	x	x	x				x									x		x		x			x			x												x		
d	30 to 39	4																						x				x		x				x								
e	More than 40	7									x	x	x	x																	x				x			x				
f	None of the above	1															x																										
3	**Please choose the most suitable answer regarding the form of education in digital dentistry in your school, if applicable**																																									
a	Digital dentistry is delivered as mandatory classes	18	x		x	x		x		x	x			x									x	x		x				x	x			x	x		x	x	x		x
b	Digital dentistry is delivered partly as mandatory and partly as elective classes	13		x			x					x	x		x			x	x	x	x				x		x		x							x						
c	Digital dentistry is delivered as elective classes	4														x												x		x			x									
d	Not applicable	4							x								x																		x								
4	**Please choose all the answers that best describe the education on digital dentistry in your school**																																									
a	Education is delivered on the basis of lectures	25	x	x	x	x	x		x	x				x		x		x	x	x	x			x		x	x		x				x	x	x	x	x	x	x	x	x	x
b	Education is delivered on the basis of seminars	16				x			x									x	x	x					x	x	x	x	x	x	x			x				x			x	x
c	Education is delivered on the basis of practical classes, workshops, hands on etc.	26		x		x		x	x	x	x	x	x	x	x			x	x	x			x	x		x			x			x		x	x	x	x		x	x	x	x
d	Not applicable	1															x																										
5	**Please choose all the answers that describe the facilities for teaching in digital dentistry**																																								
a	Dedicated labs in the dental school	17		x									x	x				x		x						x	x		x	x			x	x		x	x	x			x	x	x
b	Facilities of dental clinics within the dental school	32	x	x		x	x	x	x	x	x	x	x	x	x	x			x	x	x		x	x	x	x	x	x	x		x			x	x	x	x	x	x	x	x	x
c	Dental offices outside the dental school	6			x	x	x			x																x										x						
d	Not applicable	2															x																					x					

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Artificial Intelligence (AI) has been rapidly gaining popularity in the field of dentistry, offering a wide range of benefits such as improved accuracy in diagnosis, treatment planning, and better patient outcomes. However, like any technology, AI is not without its challenges, and there are some potential problems with AI in dentistry that need to be addressed.

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AI - development

- Coordination with the Scientific Committee of FDI
- United session - prof. Schwendicke
- Coordination of documents

Updates

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- Aim to regulate AI in the EU – generally and in the Medicine
- Updates in EDHS
- CED materials to regulate DIY Dentistry, especially in Orthodontics
- Extreme speed development due to AI self-programming – 2 generations of AI between our meetings
- Growing space between dental offices with and without AI- necessity of AI support like is/was IT support

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Actual Trends of AI in Dentistry

- Administration!!
- Marketing – AI chatbots
- X Ray screening and primary reading- some companies are offering it free of charge
- Experiments in diagnostics and Tx modalities

WG ERO-FDI: Recommendation Material for the Use of AI in Dentistry

(Position paper)

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.

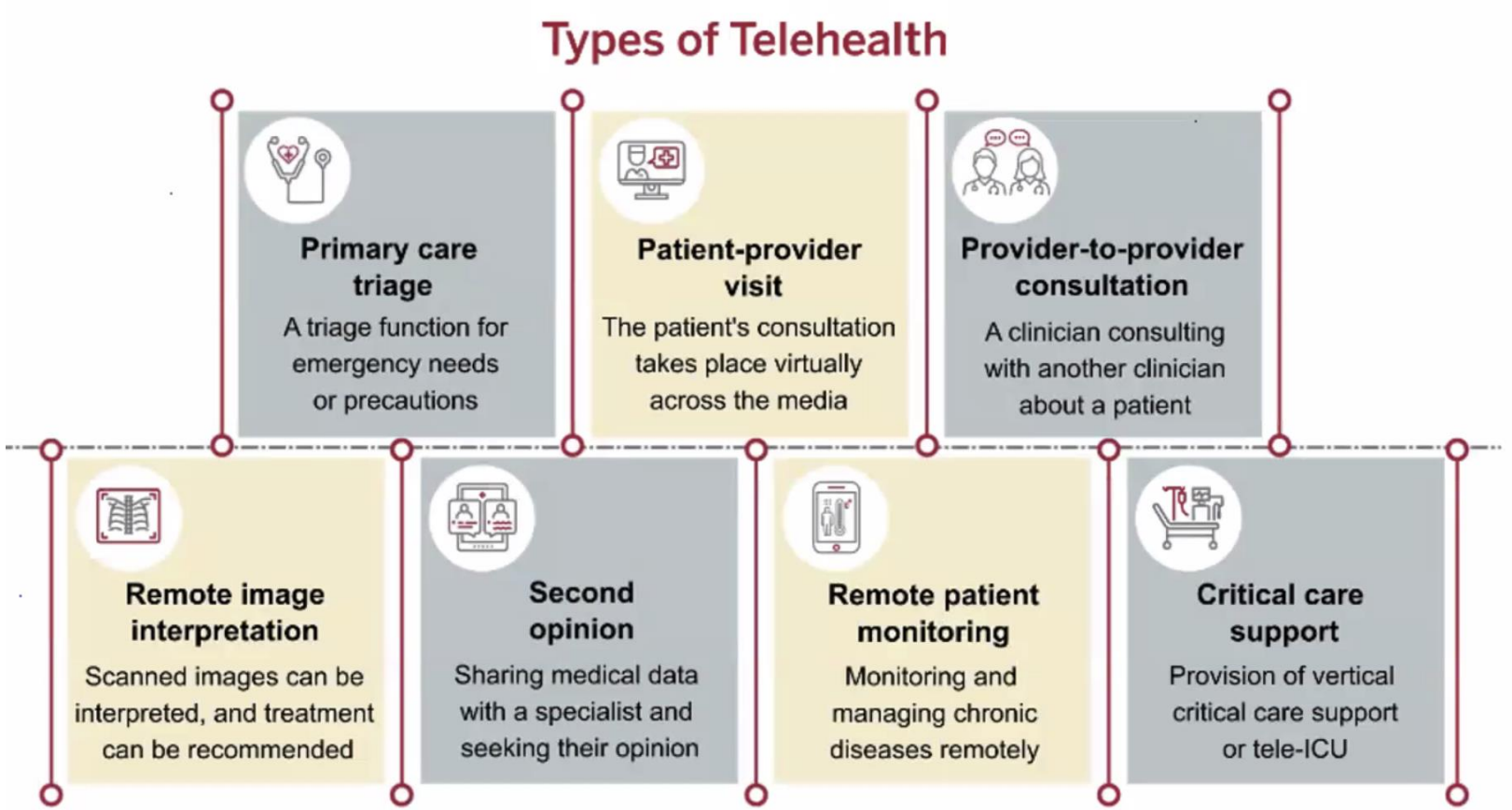
b. Education must involve all dental team members according to their professional responsibility.

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.*

Teledentistry – not so easy but complete revolution



What we have to do

- Teledentistry – who, when, where, for whom , recommendation
- Autodiagnostic systems and other home-devices – recommendation

Proposals we will present in the next meeting of ERO