EUROPEAN REGIONAL ORGANIZATION
OF THE FEDERATION DENTAIRE INTERNATIONALE FDI

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

Roman Smucler

Istanbul Meeting April 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							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
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
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
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
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
c	Dental offices outside the dental school	6			x	x	x			x																x										x					
d	Not applicable	2															x																					x				

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6	**Please choose all aspects of digital dentistry taught in your school**																																									
a	Dental photography	29	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
b	Use of X-ray based diagnostic imaging in planning of orthodontic treatment	29	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	Use of X-ray based diagnostic imaging in implant placement planning	29	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
d	Virtual planning of surgeries	13	x	x						x		x	x	x					x	x								x				x		x						x		x
e	CAD/CAM technology	28	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
f	Intraoral scanning	30	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
g	Applications of artificial intelligence in dentistry	10	x			x			x		x	x	x															x									x			x	x	
h	Not applicable	1															x																									
7	**Please choose all the answers that best describe equipment available for teaching digital dentistry**																																									
a	Photographic lab and dedicated equipment (cameras, studio lamps)	20	x						x	x	x	x	x	x				x	x	x	x			x		x	x			x							x		x	x	x	x
b	Digital X-ray machine for intraoral radiography	36	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	x	x		x
c	Digital panoramic X-ray machine	33	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
d	Digital cephalometric X-ray machine	28	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
e	Cone-Beam Computed Tomography unit	30	x	x		x	x		x	x	x	x	x		x	x		x	x	x	x		xx	x	x	x	x	x	x	x	x	x		x	x				x	x		x
f	Software for virtual planning of orthodontic treatment	19	x			x	x	x		x		x	x	x	x				x	x	x		x			x		x		x					x					x		x
g	Software for virtual planning of implant placement	21	x			x	x				x	x	x	x		x			x	x			x	x		x		x				x	x	x	x					x	x	x
h	Software for virtual planning of surgeries	12	x									x	x	x		x			x	x			x										x	x						x		x
i	CAD/CAM milling machine	21	x	x	x	x			x		x	x	x	x					x				x		x	x		x		x		x	x		x	x				x		x
j	3D printer	23	x	x		x	x		x		x	x	x	x					x	x			x		x	x		x		x		x	x			x			x	x	x	x
k	Intraoral scanner	29	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
l	Simulator	16	x					x	x		x	x	x					x	x				x				x	x					x			x	x		x	x		
m	None of the above	2															x											x														

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8	**How many dental schools are there in your country? (Open question)**															1																										
	Number	37	9	2	3	5	4	1	5	1	31	30	35	35	7	3	5	2	1	3	2		3	3	10	9	10	10	10	10	10	7		4	23	4	110	15	16	16	16	16
9	**What kind of dental schools are there in your country?**																																											
a	Only public	24		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	Public and private	12	X									X	X	X		X	X			X												X	X	X	X		X					
c	Only private	2						X							X																											
10	**In which year education in preclinical digital dentistry is delivered (please choose all suitable answers)**																																											
a	1st year	4									X												X														X			X		
b	2nd year	18		X					X	X	X	X				X		X	X							X	X	X	X				X			X		X	X	X		X
c	3rd year	20	X		X	X				X	X		X	X	X			X		X			X		X	X	X			X	X	X				X	X			X		
d	4th year	10			X	X	X	X					X	X	X								X											X	X					X		
e	5th year	8					X						X	X	X								X	X										X	11					X		
f	Not applicable	2															X				X																					
11	**In which year education in clinical digital dentistry is delivered (please choose all suitable answer)**																																											
a	1st year	1																																					X		
b	2nd year	2																																			X				X
c	3rd year	10		X		X			X			X	X					X								X		X								X						X
d	4th year	28	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
e	5th year	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
f	Not applicable	4												X	X		X														X											
12	**To which students is digital dentistry delivered in your school (please choose all suitable answers)**																																											
a	Dental students	36	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	X	X	X
b	Students in dental technology	8																							X	X	X	X				X				X				X	X	
c	Other university degree (nurse, radiography assistant, dental hygienist)	7											X													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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- 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.
- One of the main challenges with AI in dentistry is data quality. To train AI algorithms, a large amount of data is needed, and this data must be of high quality. If the data is inaccurate, incomplete, or biased, the AI algorithm will learn from this flawed data and produce incorrect or biased results. Therefore, it is crucial to ensure that the data used to train AI algorithms is accurate, reliable, and representative of the patient population.
- Another issue with AI in dentistry is the potential for over-reliance on technology. While AI can provide valuable insights and recommendations, it should not replace the clinical expertise and judgement of a trained dental professional. AI should be viewed as a tool to assist dental professionals in their decision-making process, rather than a substitute for their expertise.
- Privacy and security concerns are also important considerations when it comes to AI in dentistry. Patient data is sensitive information, and there is a risk of data breaches or cyberattacks. It is essential to ensure that appropriate security measures are in place to protect patient privacy and data.
- Finally, there is a need to address the potential ethical implications of AI in dentistry. For example, there may be concerns around the use of AI algorithms to determine insurance coverage or treatment plans. It is important to ensure that AI is used ethically and that patients are fully informed about how their data is being used.
- In conclusion, while AI has the potential to revolutionize dentistry, it is essential to address the challenges and potential problems that come with this technology. By doing so, we can ensure that AI is used effectively and ethically to improve patient outcomes and advance the field of dentistry.

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- **One of the main challenges with AI in dentistry is data quality.** To train AI algorithms, a large amount of data is needed, and this data must be of high quality. If the data is inaccurate, incomplete, or biased, the AI algorithm will learn from this flawed data and produce incorrect or biased results. Therefore, it is crucial to ensure that the data used to train AI algorithms is accurate, reliable, and representative of the patient population.
- **Change is not in software but in proper dataset!!**
- **To be in touch with main companies to help them with dataset**
- **One dataformat - unification**

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- **Another issue with AI in dentistry is the potential for over-reliance on technology.**
- It is necessary to inform patient about use of AI
- Real control of AI results by human
- Guidance (regulation) for self monitoring by AI

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- **Privacy and security concerns**
- AI can find „hidden data“, more protection is needed
- AI can make photos

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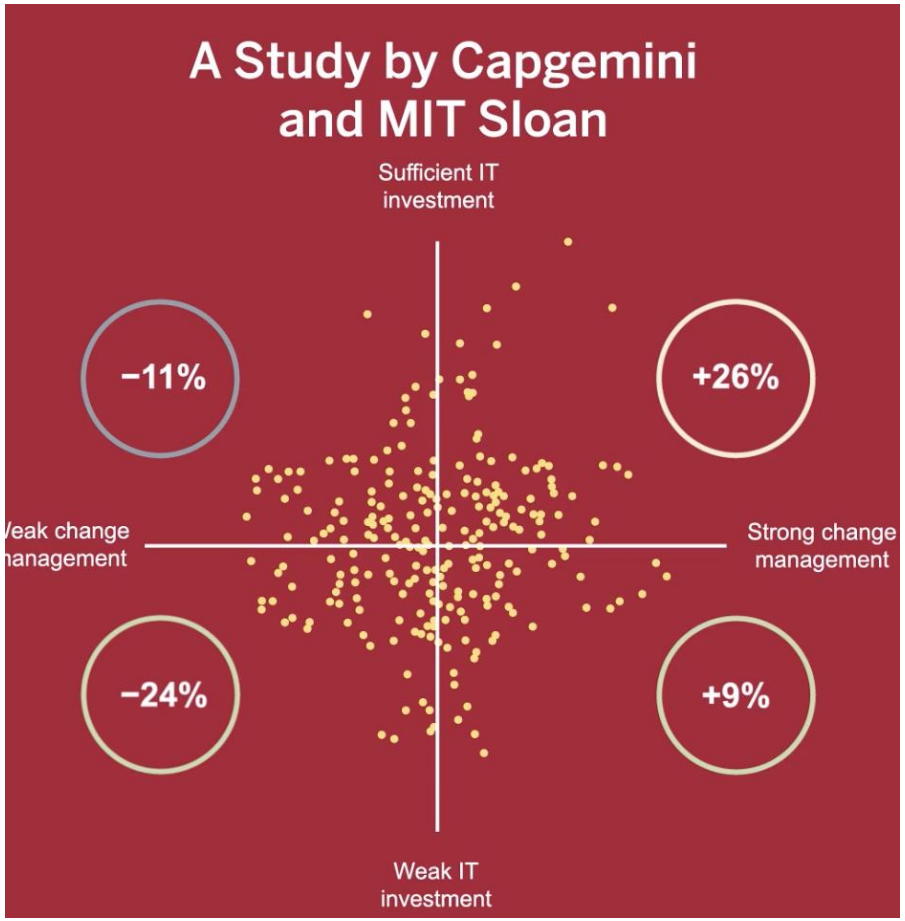
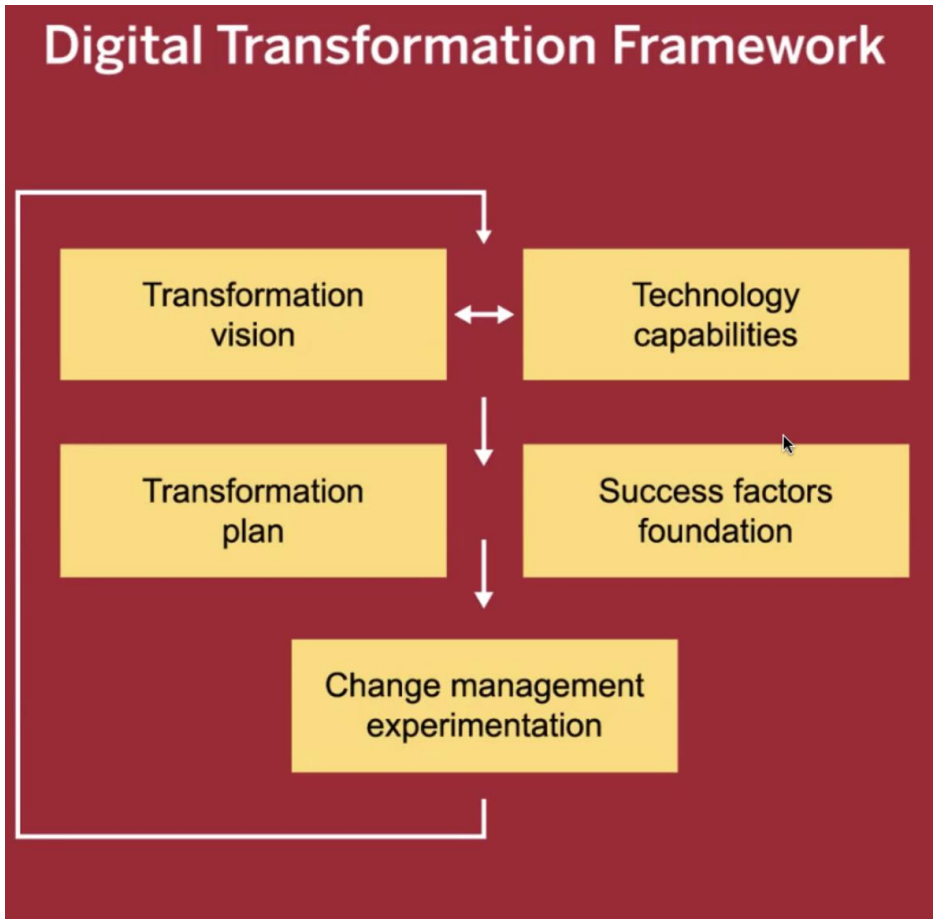
- **Ethical implication**
- AI can make photos and videos as you want so „unrealistic results“ will be broadly accessible
- AI can change medical documentation
- Intellectual property concerns

Teledentistry in dental caries screening and treatment organisation. Quantum change in dentistry.

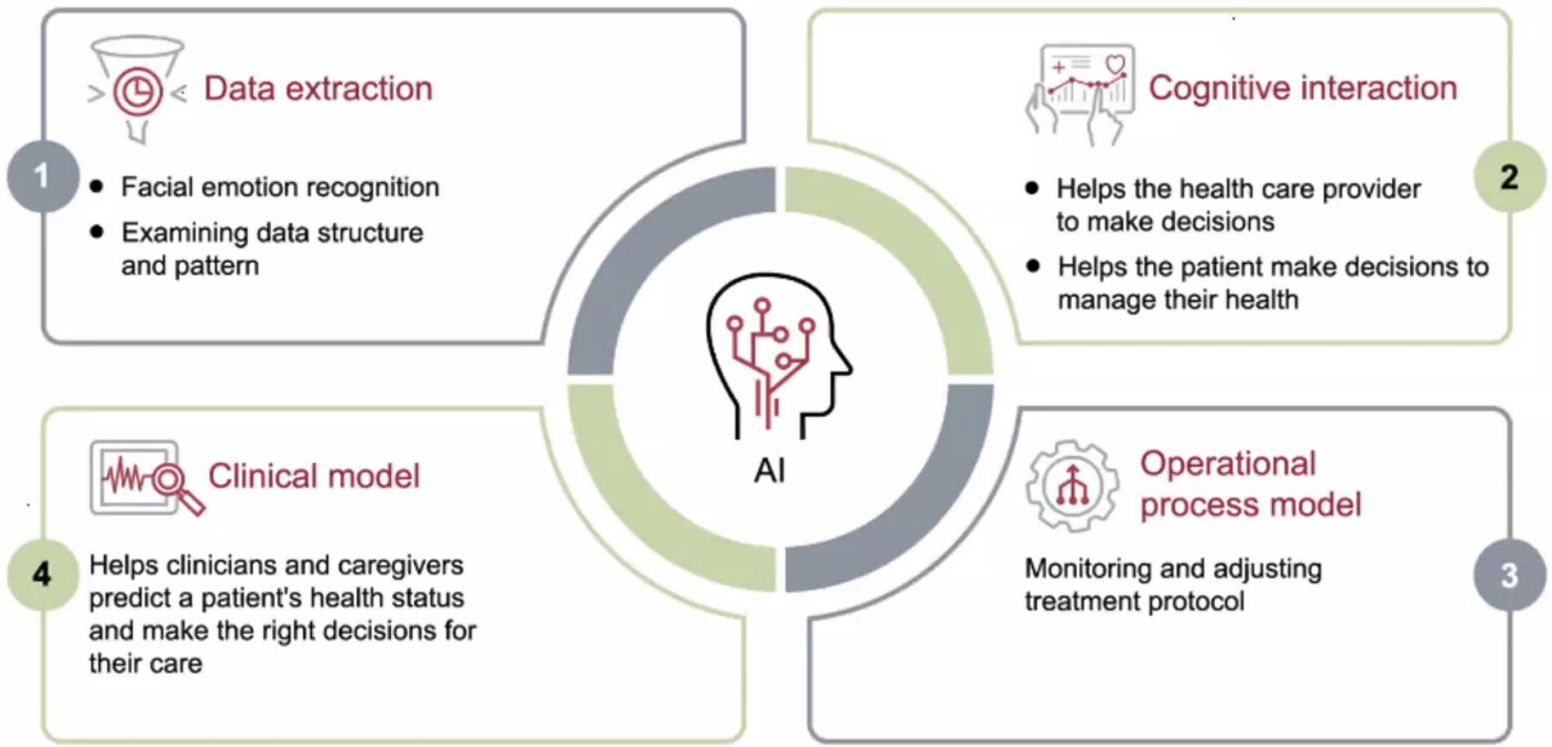
Roman Smucler, DDS, PhD
FDI –ERO AI-WG
Czech Dental Chamber-president

IT revolution works only with completely changed system of care delivery

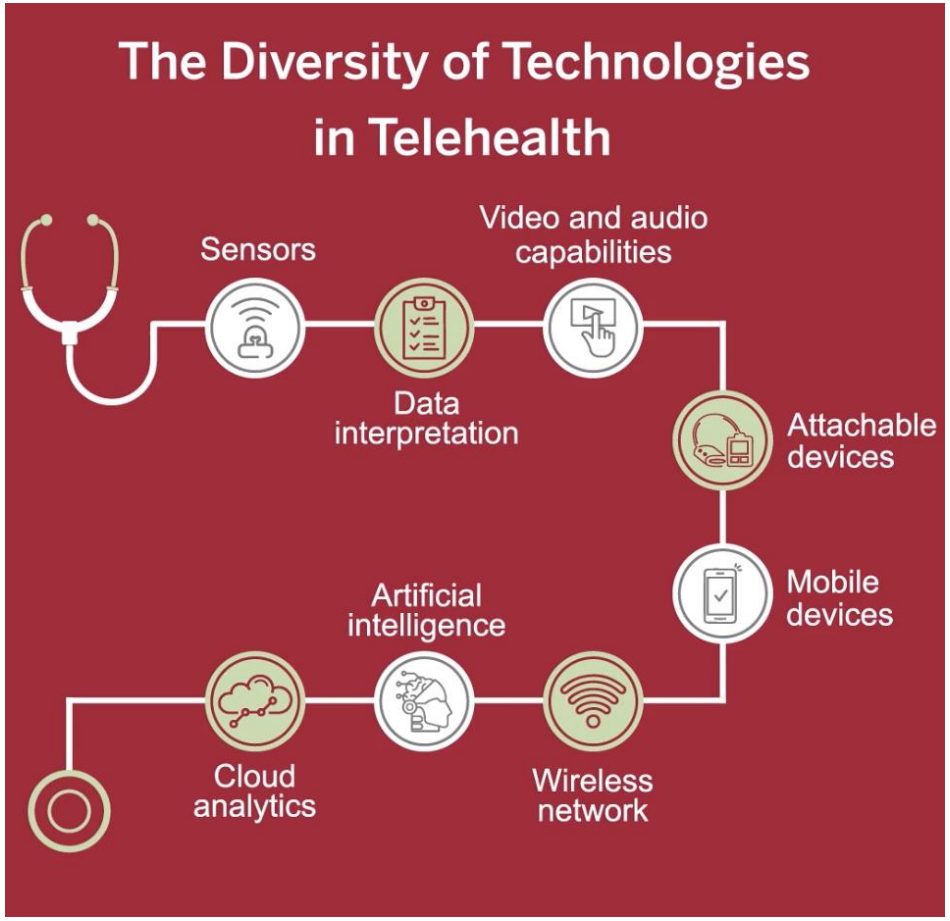


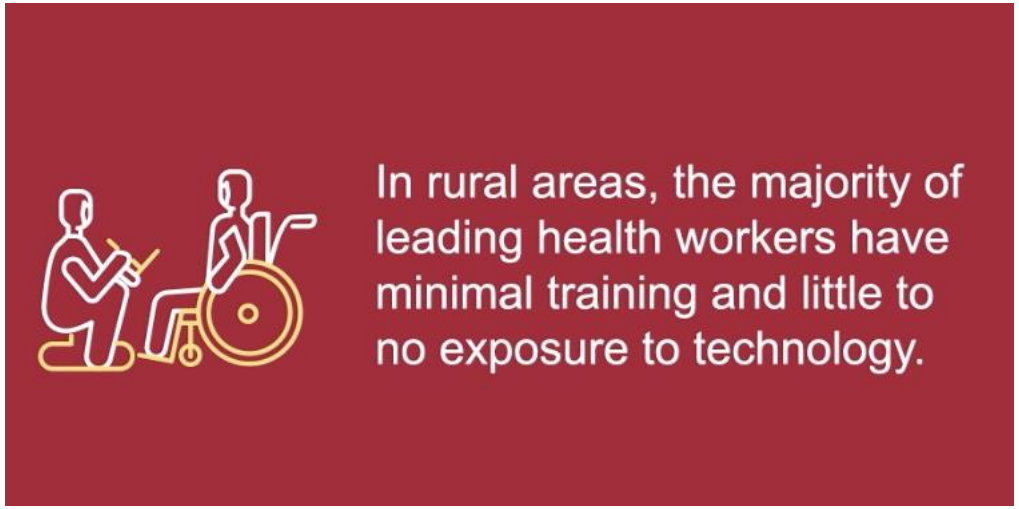

Digital Transformation Framework
Transformation vision
Technology capabilities
Transformation plan
Success factors foundation
Change management experimentation

The Range of AI Capabilities in Health Care

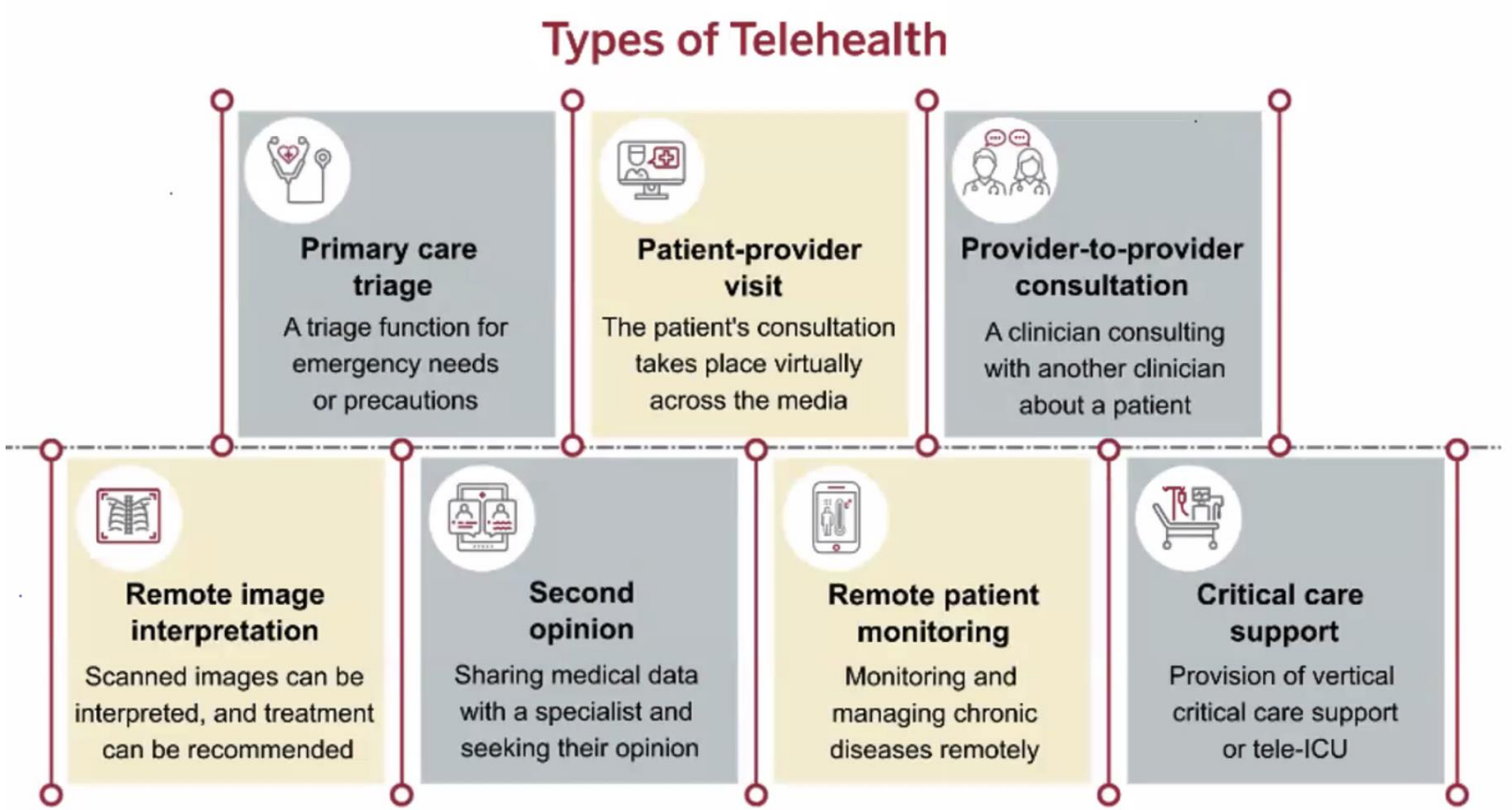


Teledentistry – not so easy but complete revlolution

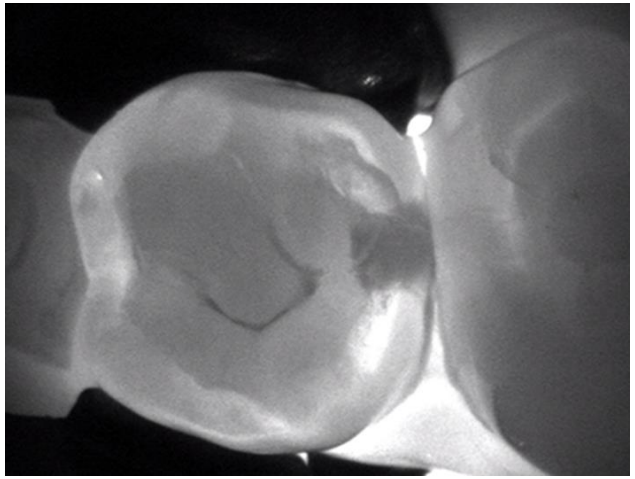




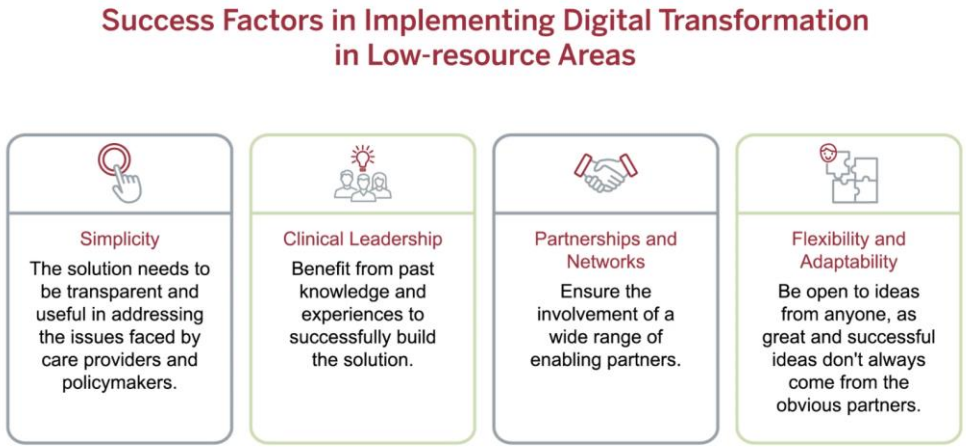
Teledentistry – not so easy but complete revlolution

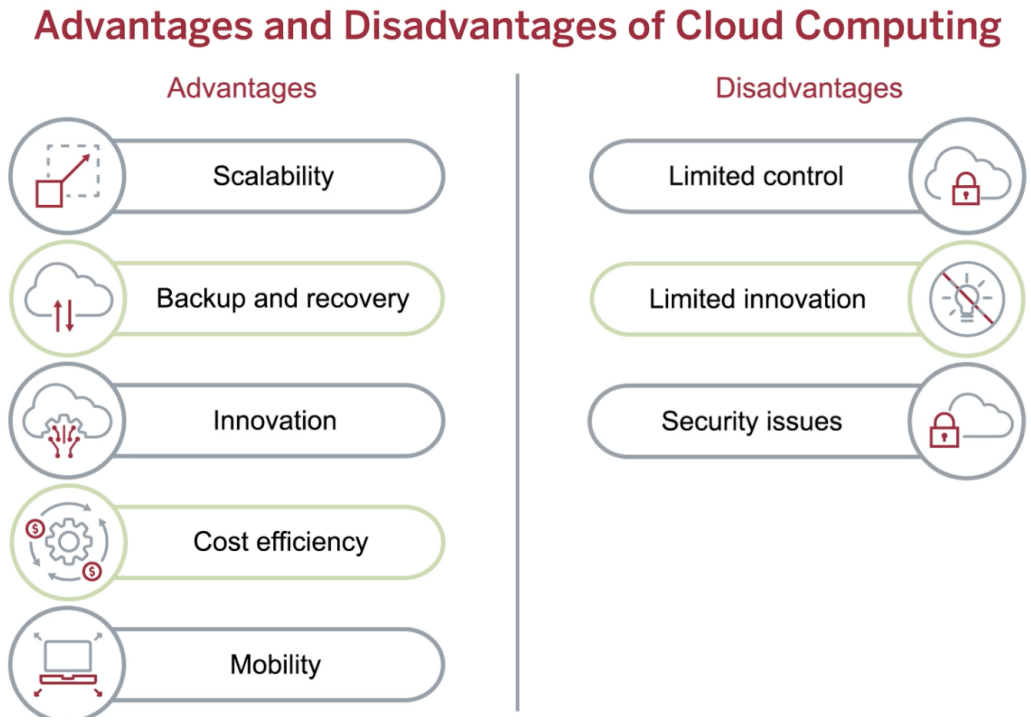


- Screening, self-cotrol is reality



Interooperability , EDHS and others clouds





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What we have to do

- Guidance in AI – regulation? , ifromations for patient, updates
- Teledentistry – who, when, where, for whom , regulations
- Autodiagnostic systems and other homedevices – regulation

Proposals we will discuss next weeks –first draft- Sydney