

ETHICS IN DENTISTRY:

Discussion of the Hippocratic Oath, ADA Code of Ethics, and Artificial Intelligence

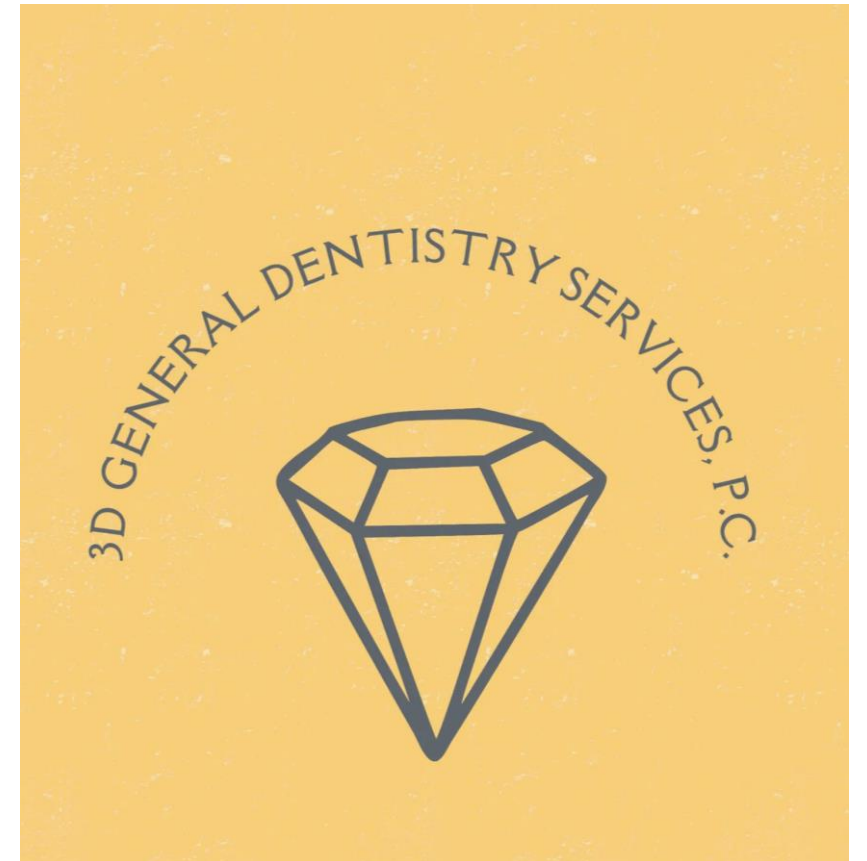
UAB Alumni Meeting

February 6, 2025

Hyatt Regency Birmingham-The Winfrey Hotel

Barry E. Goodspeed, DDS

3D General Dentistry Services, P.C.

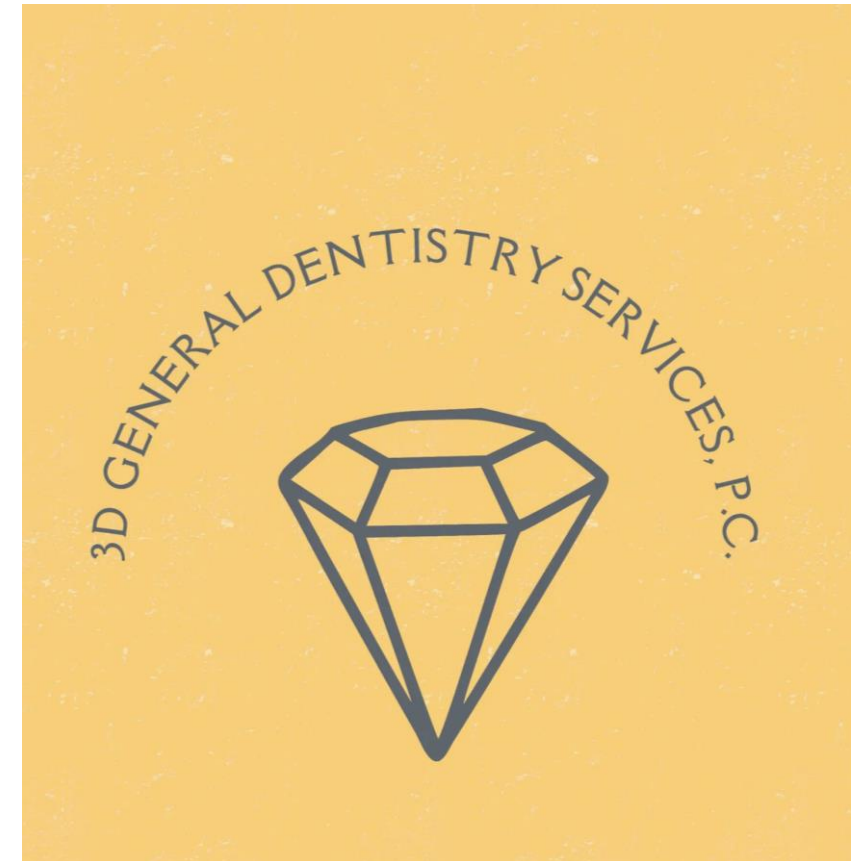


ETHICS IN DENTISTRY:

Review of The Hippocratic Oath, the ADA “Principles of Ethics and Code of Professional Conduct,” and Artificial Intelligence

COURSE OBJECTIVES

1. Review **The Hippocratic Oath** and understand its influence on modern medicine and dentistry.
2. Review the **American Dental Association “Principles of Ethics and Code of Professional Conduct.”** Learn its three main components; learn its five principles.
3. Review two current publications, (1) **“Artificial Intelligence in Dentistry, Chances and Challenges,”** Schwendicke F, Samek W, and Krois J.; (2) American Dental Association SCDI White Paper No. 1106, **Dentistry-Overview of Artificial Intelligence Uses in Dentistry.**
4. Understand the ADA **principles of ethics at stake** in the rapid development of **AI** in dentistry, specifically highlighting several popular **software applications.**



Disclosure

NO CONFLICT OF INTEREST:

Neither 3D General Dentistry Services, P.C., nor Barry E. Goodspeed, DDS have a personal interest or financial investment in any company or product included in this presentation.

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OTHER

The UAB Alumni Association is providing an honorarium for
Dr. Barry Goodspeed's presentations.

...before Hippocrates

There was a Persian (now Iran) prophet **c. 628-c. 551 BCE**

Zarathushtra or Zarathustra, known in Greek as Zoroaster

- He was a priest of an ancient Persian religion.
- He believed "the gods and humankind are both bound to observe the same ethical principles."
- Zarathustra's teachings included:

"From their freedom of decision, it follows that human beings are finally responsible for their fates."

(Tuck away this historical tidbit until this presentation later demonstrates its relevance.)

About the The Hippocratic Oath

Indla V, Radhika MS. Hippocratic oath: Losing relevance in today's world? Indian J Psychiatry. 2019 Apr;61(Suppl 4):S773-S775.

- "Hippocrates is considered to be the father of medicine."
- The oath, originated c. 400 BCE, was to the gods of healing.
- "The oath became universal only toward the early 19th century. "
- Much attention was on beneficence and non-maleficence.
- It may "be in conflict with [some] existing laws."
- "In 1973, the US Supreme Court rejected the oath as a guide to medical ethics and practice by stating that the oath is incapable of covering the latest developments and methods of medical practice and research."

This being said, The Hippocratic Oath is administered by many U.S. medical schools and "is more of an ethical signpost."

OATH OF HIPPOCRATES

I SWEAR BY APOLLO THE HEALER, BY AESCULAPIUS, BY HYGEIA (HEALTH) AND ALL THE POWERS OF HEALING, AND CALL TO WITNESS ALL THE GODS AND GODDESSES THAT I MAY KEEP THIS OATH, AND PROMISE TO THE BEST OF MY ABILITY AND JUDGMENT:

I WILL PAY THE SAME RESPECT TO MY MASTER IN THE SCIENCE (ARTS) AS I DO TO MY PARENTS, AND SHARE MY LIFE WITH HIM AND PAY ALL MY DEBTS TO HIM.

I WILL REGARD HIS SONS AS MY BROTHERS AND TEACH THEM THE SCIENCE, IF THEY DESIRE TO LEARN IT, WITHOUT FEE OR CONTRACT.

I WILL HAND ON PRECEPTS, LECTURES, AND ALL OTHER LEARNING TO MY SONS, TO THOSE OF MY MASTER, AND TO THOSE PUPILS DULY APPRENTICED AND SWORN, AND TO NONE OTHER.

I WILL USE MY POWER TO HELP THE SICK TO THE BEST OF MY ABILITY AND JUDGMENT; I WILL ABSTAIN FROM HARMING OR WRONGDOING ANY MAN BY IT.

I WILL NOT GIVE A FATAL DRAUGHT (DRUGS) TO ANYONE IF I AM ASKED, NOR WILL I SUGGEST ANY SUCH THING. NEITHER WILL I GIVE A WOMAN MEANS TO PROCURE AN ABORTION.

I WILL BE CHASTE AND RELIGIOUS IN MY LIFE AND IN MY PRACTICE.

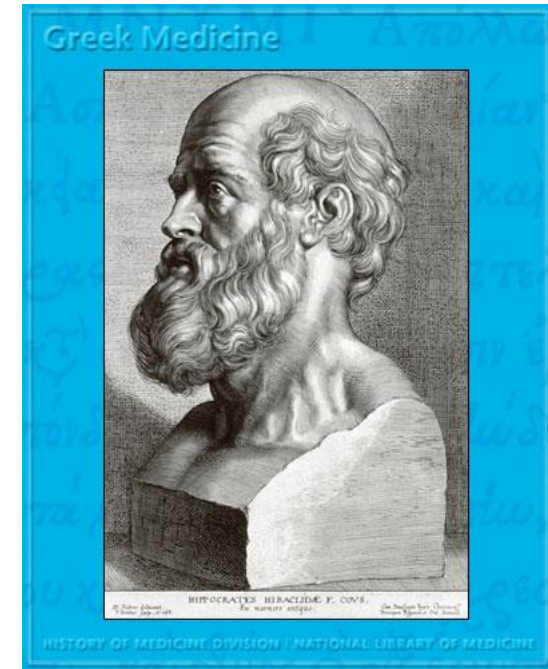
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WHENEVER I GO INTO A HOUSE, I WILL GO TO HELP THE SICK, AND NEVER WITH THE INTENTION OF DOING HARM OR INJURY.

I WILL NOT ABUSE MY POSITION TO INDULGE IN SEXUAL CONTACTS WITH THE BODIES OF WOMEN OR OF MEN, WHETHER THEY BE FREEMEN OR SLAVES.

WHATEVER I SEE OR HEAR, PROFESSIONALLY OR PRIVATELY, WHICH OUGHT NOT TO BE DIVULGED, I WILL KEEP SECRET AND TELL NO ONE.

IF, THEREFORE, I OBSERVE THIS OATH AND DO NOT VIOLATE IT, MAY I PROSPER BOTH IN MY LIFE AND IN MY PROFESSION, EARNING GOOD REPUTE AMONG ALL MEN FOR ALL TIME. IF I TRANSGRESS AND FORSWEAR THIS OATH, MAY MY LOT BE OTHERWISE.



https://www.nlm.nih.gov/hmd/greek/greek_oath.html

From HIPPOCRATIC WRITINGS, translated by J. Chadwick and W. N. Mann, Penguin Books, 1950 from

history.nih.gov/download/attachments/1016866/hippocratic.pdf?api=v2

Font choice and arrangement by Barry E. Goodspeed, 2023; wallpapertag.com 135088-cool-papyrus-background-2635x1865

...“I may keep this Oath, and promise to the best of my ability and judgment:”

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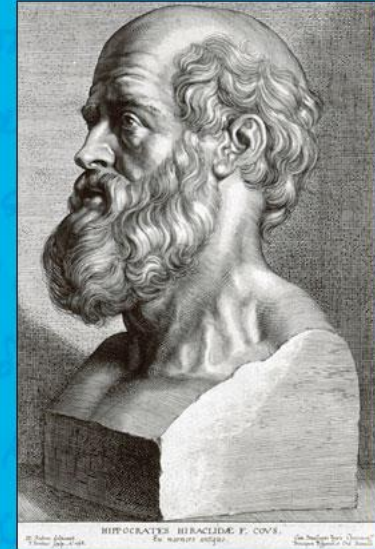
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Greek Medicine



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“I will pay the same respect to my master [teacher]” ...

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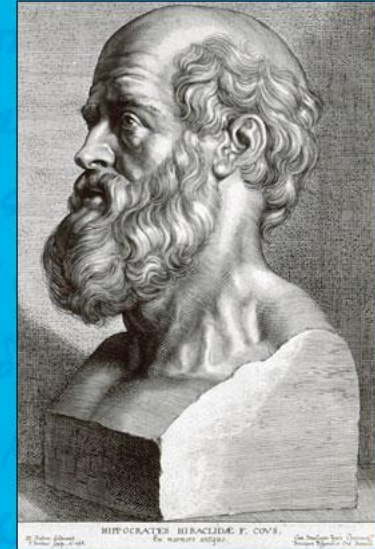
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Greek Medicine



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“I will hand on precepts ...to...pupils...”

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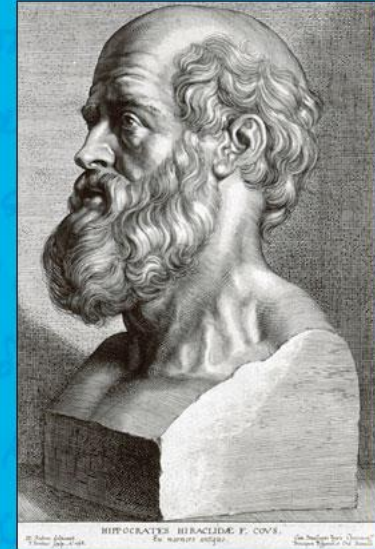
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“I will use my power to help the sick to the best of my ability and judgement;”

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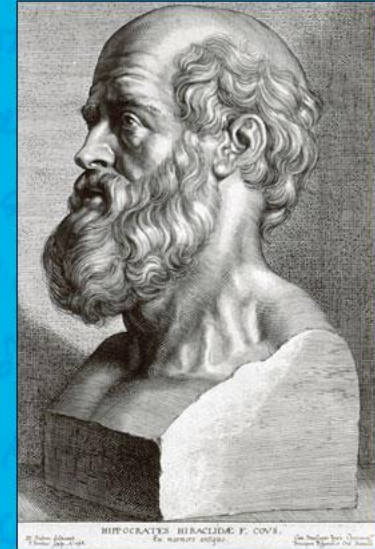
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“I will abstain from harming...any man...”

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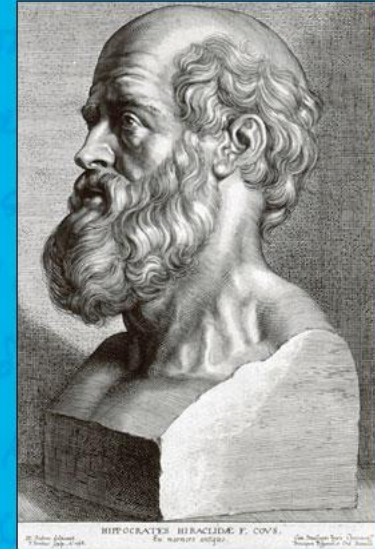
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“Whatever I see or hear, professionally or privately, I will keep secret and tell no one.”

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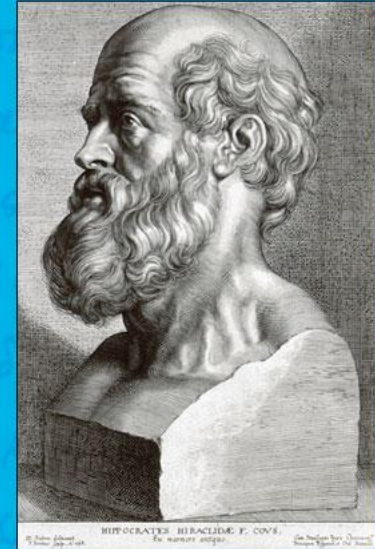
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“If, therefore, I observe this oath,...may I prosper both in my life and profession...”

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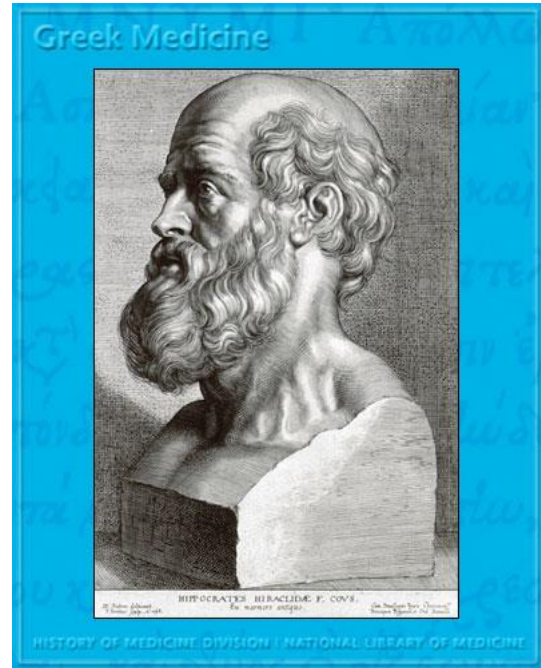
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American Dental Association

“Principles of Ethics and Code of Professional Conduct.”

The first code of Ethics was adopted by the ADA in
1866.

“a written expression of the obligations
arising from the implied contract between
the dental profession and society.”

https://www.ada.org/-/media/project/ada-organization/ada/ada-org/files/about/ada_code_of_ethics.pdf?rev=f4535c52488446ebbea257ea1b92a4db&hash=FD5B4E3FF8A12F3920173522170B7ACC

ADA “Principles of Ethics and Code of Professional Conduct”

Three Main Components

Principles of Ethics

Code of Conduct

“justified”

by one or more

Principles of Ethics

Advisory Opinions

The ADA Code of Ethics elaborates on numerous opinions about specific topics.

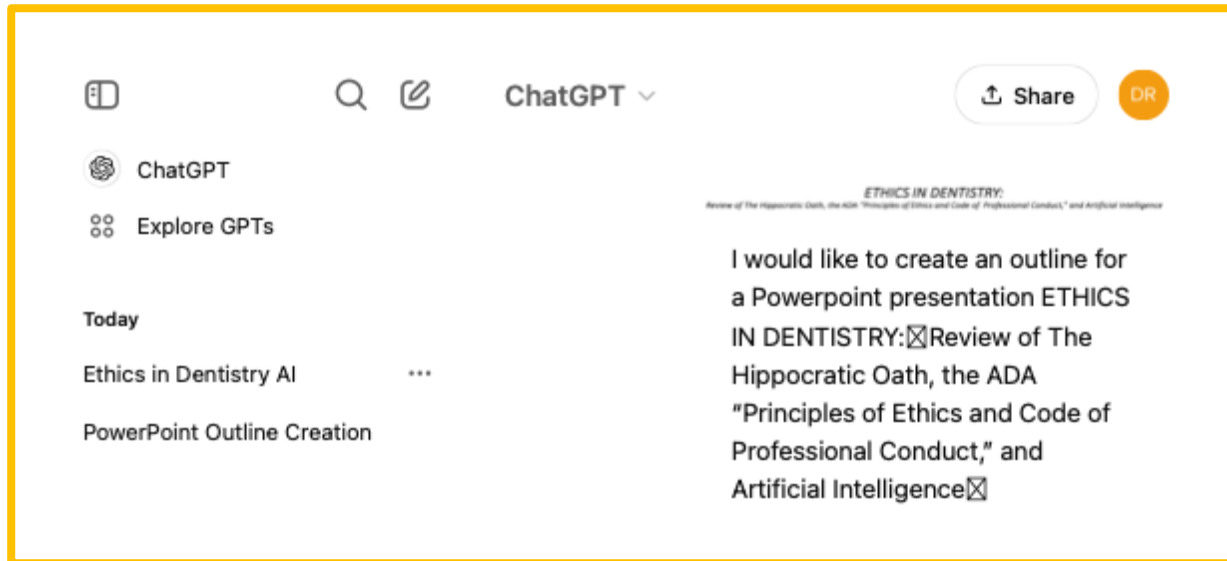
ADA “Principles of Ethics and Code of Professional Conduct”

Five Principles

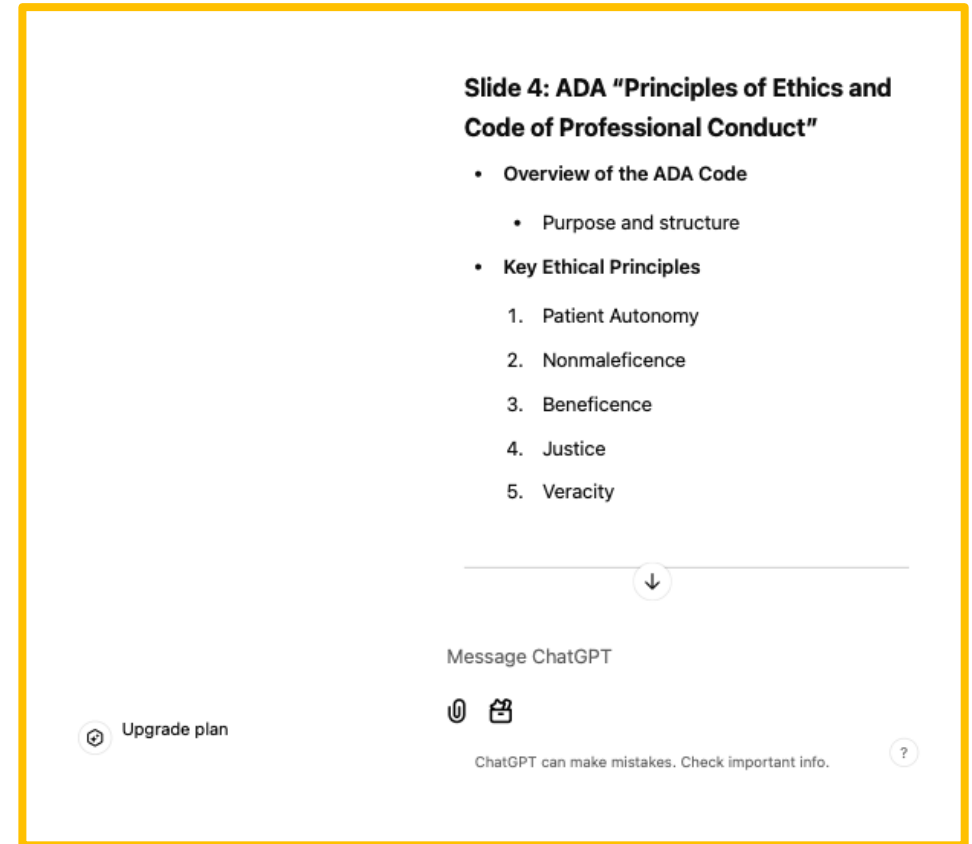
Listed under Dental Ethics

- 1. Patient Autonomy**
- 2. Nonmaleficence**
- 3. Beneficence**
- 4. Justice**
- 5. Veracity**

ChatGPT Generated Content:



The screenshot shows the ChatGPT web interface. At the top, there are navigation icons for home, search, and edit, followed by the text "ChatGPT" and a dropdown arrow. To the right are "Share" and "DR" buttons. The left sidebar contains "ChatGPT" and "Explore GPTs" options. Under the "Today" section, there are two chat sessions: "Ethics in Dentistry AI" and "PowerPoint Outline Creation". The main chat area displays a user message: "I would like to create an outline for a Powerpoint presentation ETHICS IN DENTISTRY: Review of The Hippocratic Oath, the ADA 'Principles of Ethics and Code of Professional Conduct,' and Artificial Intelligence".



The screenshot shows a generated PowerPoint slide. The title is "Slide 4: ADA 'Principles of Ethics and Code of Professional Conduct'". The slide content includes:

- Overview of the ADA Code
 - Purpose and structure
- Key Ethical Principles
 1. Patient Autonomy
 2. Nonmaleficence
 3. Beneficence
 4. Justice
 5. Veracity

Below the slide content is a "Message ChatGPT" input field with a "Send" button. At the bottom left is an "Upgrade plan" button, and at the bottom right is a disclaimer: "ChatGPT can make mistakes. Check important info." with a help icon.

ADA “Principles of Ethics and Code of Professional Conduct”

Patient Autonomy

“self-governance”

- “The dentist has a duty to respect the patient’s rights to self-determination and confidentiality.”
- The dentist has a “duty to treat the patient according to the patient’s desires, within the bounds of accepted treatment.”
- The dentist needs to “...obtain the patient’s written permission before forwarding health records .”
- Dentists need to “...permit the patient to remain anonymous...”



ADA “Principles of Ethics and Code of Professional Conduct”

Nonmaleficence

“do no harm”

- “All dentists, therefore, have the obligation of keeping their knowledge and skill current.”
- Consult and refer and use second opinions as appropriate.
- “...only assigning to qualified auxiliaries...”



**2025 ALUMNI WEEKEND
FEBRUARY 6-9**

The University of Alabama School of Dentistry Alumni Association

From: Dr. General Dentist
Referral to: Dr. Specialist
Regarding: Patient condition



ADA “Principles of Ethics and Code of Professional Conduct”

Beneficence

“do good”

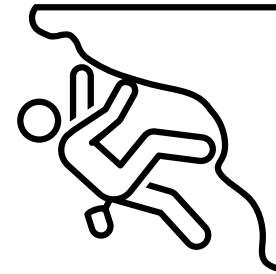
“the competent and timely delivery of dental care within the bounds of clinical circumstances presented by the patient, with due consideration being given to the needs, desires and values of the patient.”



ADA “Principles of Ethics and Code of Professional Conduct”

Justice “fairness”

- “...delivering dental care without prejudice...”
- “improve access to care”

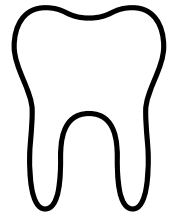
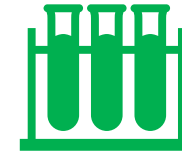


ADA “Principles of Ethics and Code of Professional Conduct”

Veracity

“truthfulness”

- “...communicating truthfully and without deception...”
- “...dentists shall be obliged to prescribe, dispense, or promote only those devices, drugs and other agents whose complete formulae are available to the dental profession.”



Artificial Intelligence in Dentistry: Chances and Challenges

Schwendicke F, Samek W, and Krois J.

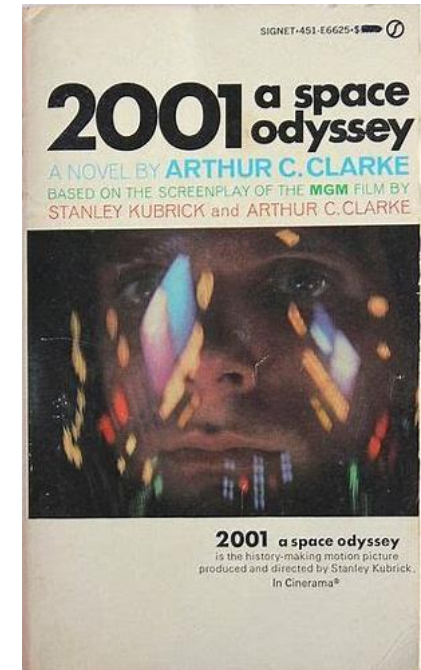
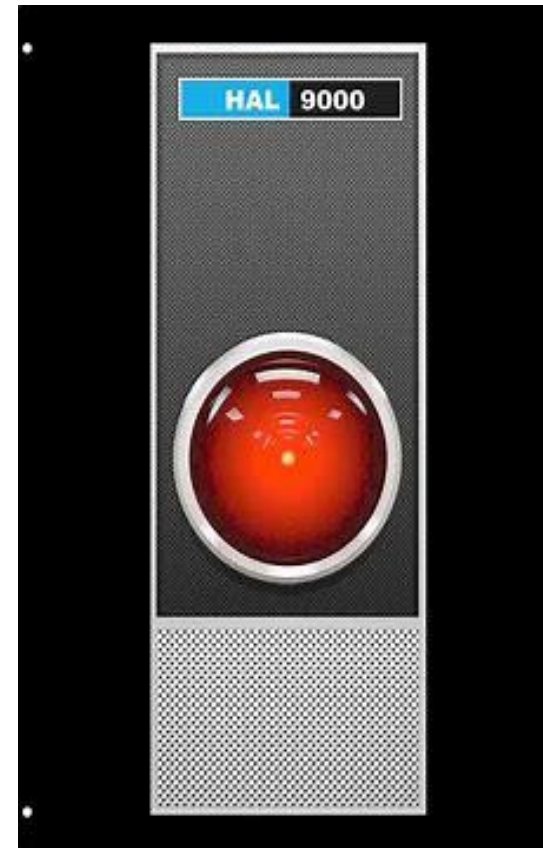
Artificial Intelligence in Dentistry: Chances and Challenges.
J Dent Res. 2020 Jul;99(7):769-774.
doi: 10.1177/0022034520915714. Epub 2020 Apr 21. PMID:
32315260; PMCID: PMC7309354.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7309354/>

Artificial Intelligence in Dentistry: Chances and Challenges

Artificial Intelligence (AI)

- “the idea of machines being capable of performing human tasks.”
- Coined in the 1950’s.



Artificial Intelligence in Dentistry: Chances and Challenges

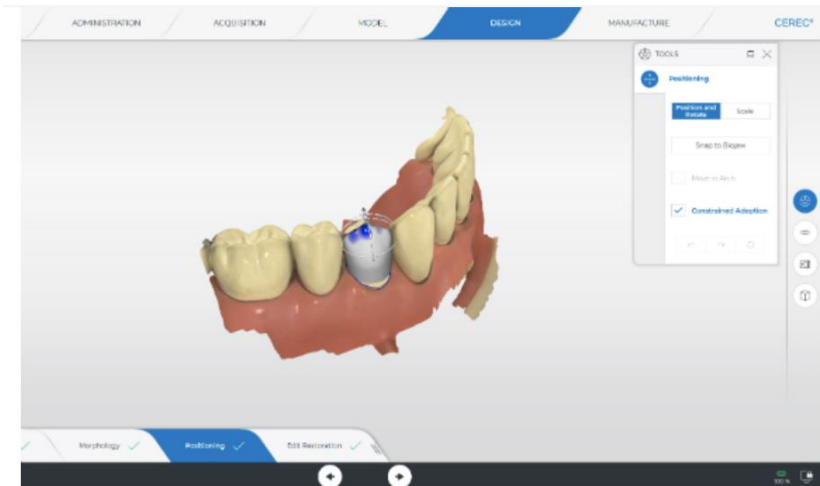
Machine Learning (ML)

- The idea of learning “intrinsic statistical patterns in data to eventually cast predictions of unseen data.”

Traditional Software

uses “rules-based expert systems; [utilizes] “data and explicitly programmed logical rules to generate narrow, specialized outcomes.”

(CEREC, CAD/CAM Software)



Biojaw

An important feature of the CEREC Software is the unique “Biojaw algorithm”. The software uses a biostatistical procedure to calculate a patient-specific initial restoration proposal based on the scanned teeth. This proposal is usually sufficient to start the production process.

Artificial Intelligence in Dentistry: Chances and Challenges

Machine Learning (ML)

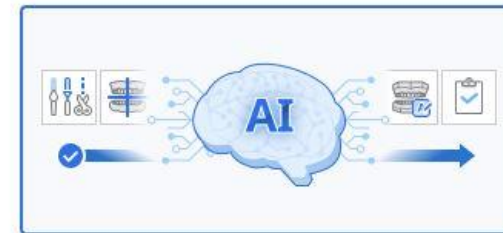
- The idea of learning “intrinsic statistical patterns in data to eventually cast predictions of unseen data.”

• Traditional Software

uses “rules-based expert systems; [utilizes] “data and explicitly programmed logical rules to generate narrow, specialized outcomes.”

(Medit Splint Software)

Choose Creation Type



Auto Creation



Manual Creation

Parameter Settings

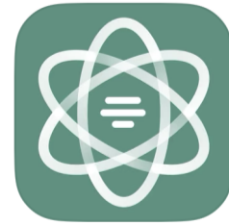
Confirm

Artificial Intelligence in Dentistry: Chances and Challenges

Neural Networks (NN)

“a popular type of ML model”
particularly useful for “complex data
structures such as imagery or
language.”

“uses data and outcome to infer the
rules[!]”



**AI Chatbot: Open
Chat AI**

Artificial Intelligence in Dentistry: Chances and Challenges

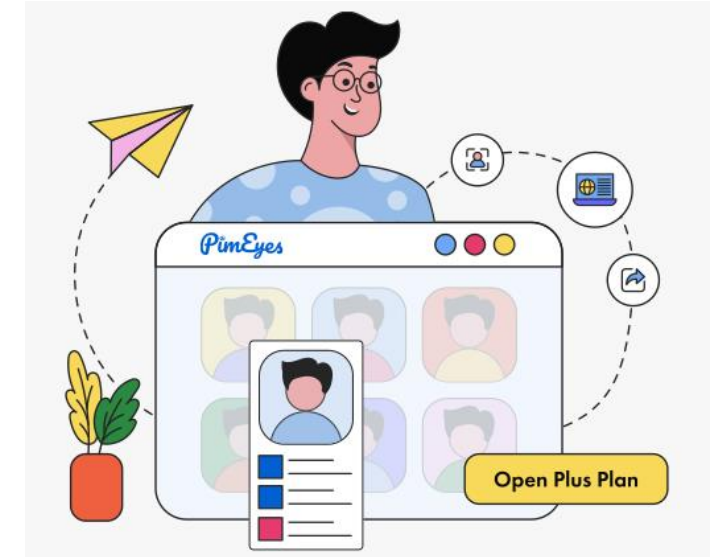
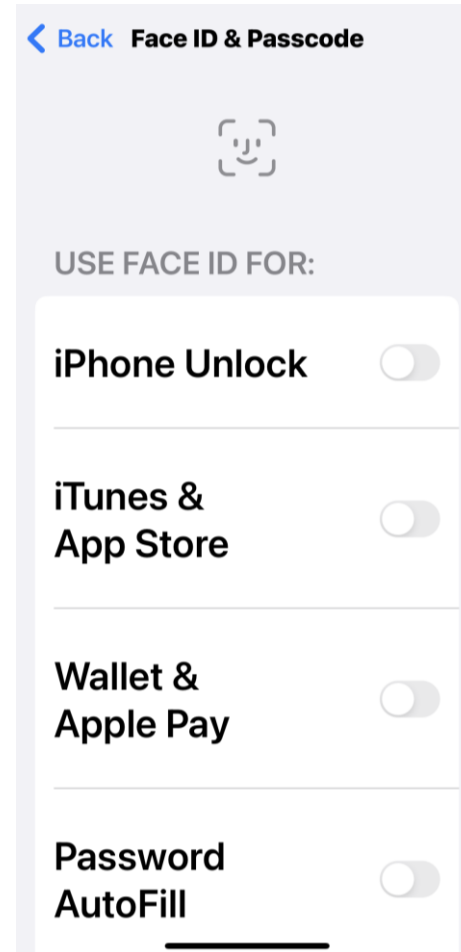
Deep Learning Software

Facial Recognition Software

Is now a reality!

”[C]onversations about [face recognition’s] impact on society, economics, healthcare, and politics are taking place in many different fields.”

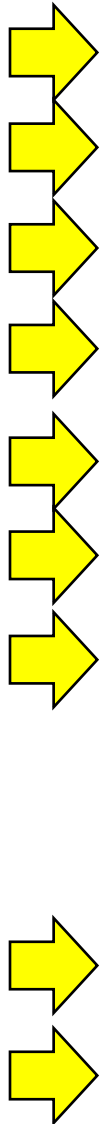
“Dentistry should be one of them.”



Dentistry-Overview of Artificial Intelligence Uses in Dentistry

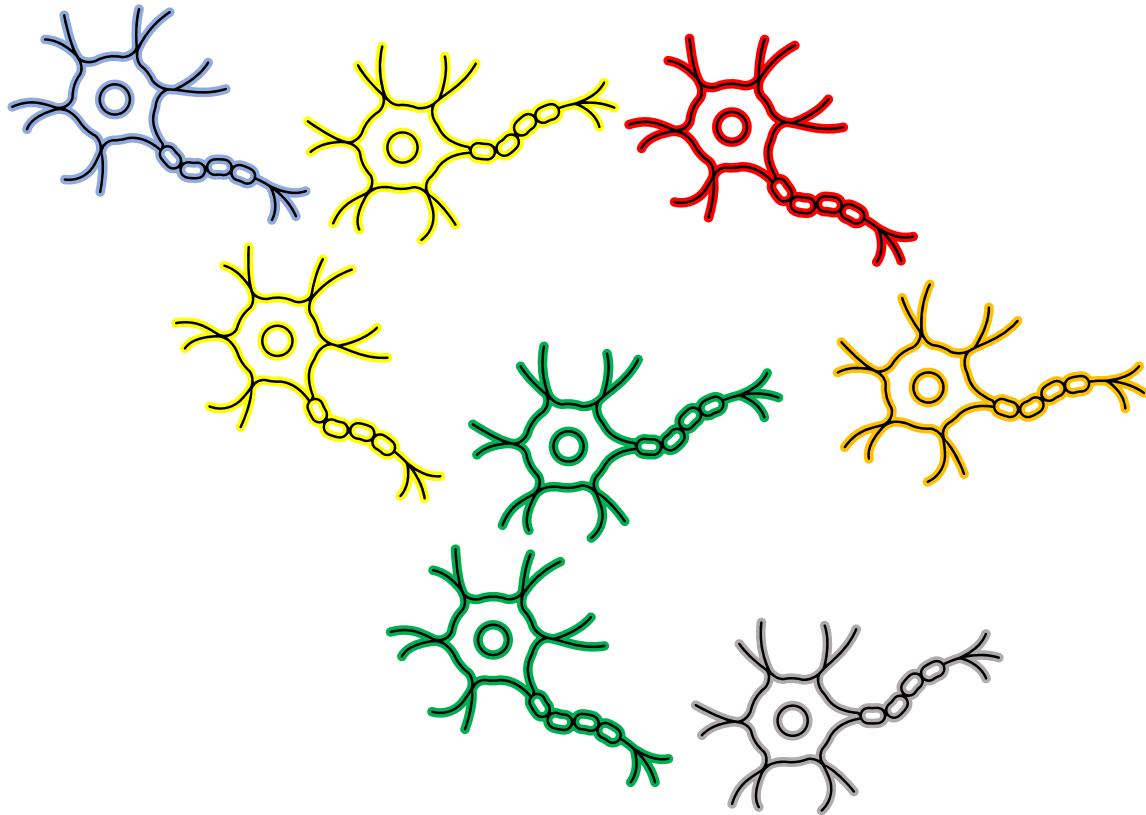
American Dental Association SCDI
White Paper No. 1106

https://www.ada.org/-/media/project/ada-organization/ada/ada-org/files/resources/practice/dental-standards/ada_1106_2022.pdf



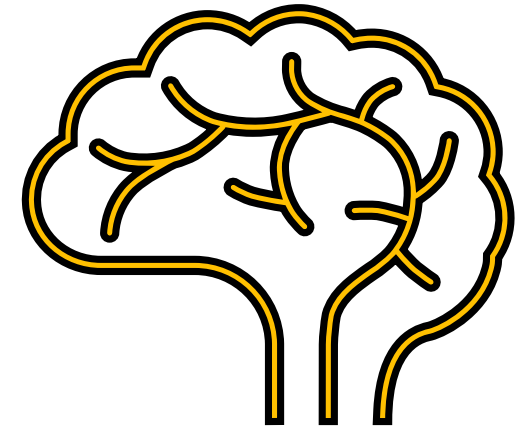
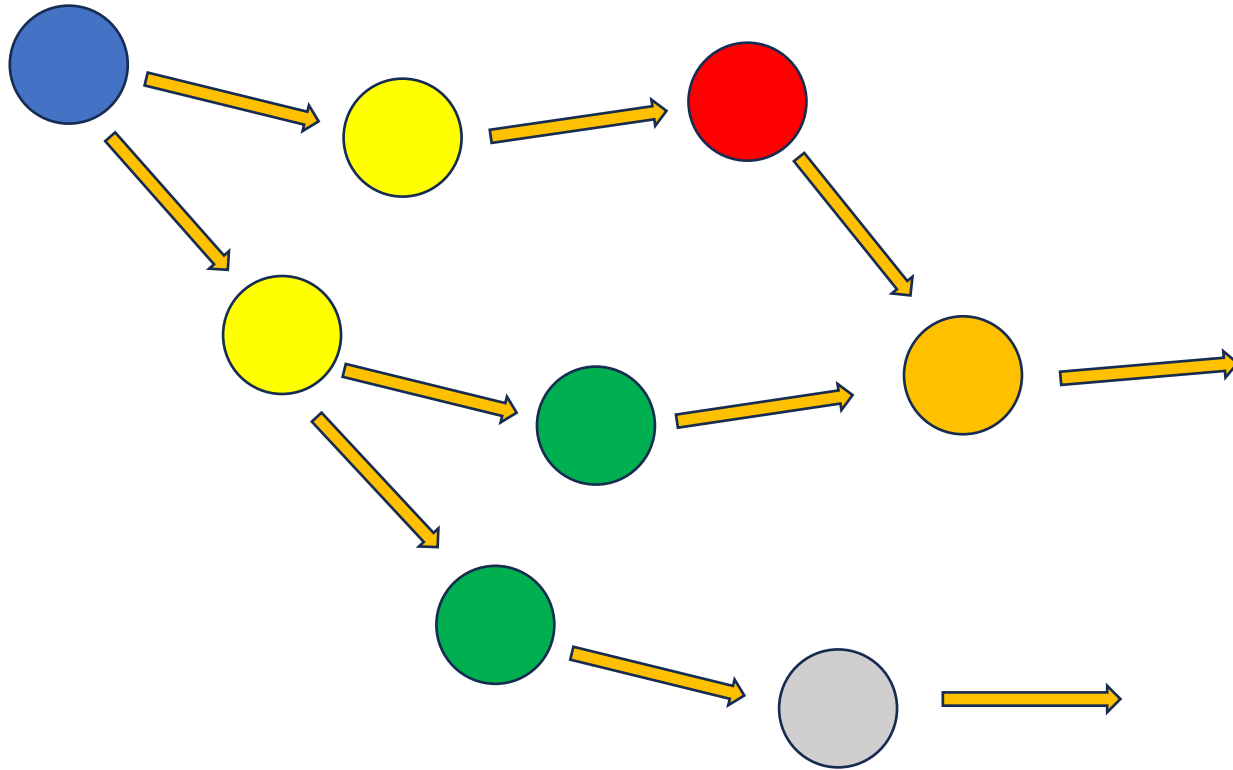
AI	GLOSSARY	Ethics in Dentistry: Discussion of the Hippocratic Oath, ADA Code of Ethics, and Artificial Intelligence
AI	Artificial Intelligence	The "idea of building machines" that are "capable of performing human tasks." (6.)
Aul	Augmented Intelligence	"Intelligence amplification." " A tool to assist the clinician in the task." (8.)
ML	Machine Learning	"A subfield of AI, in which algorithms are applied to learn intrinsic statistical patterns in data which allows for predictions on unseen data." (6.)
Algorithm		"A systematic procedure that produces—in a finite number of steps—the answer to a question or the solution of a problem." (15.)
DL	Deep Learning	"A ML technique using multi-layer mathematical operations for learning inferring on complex data like imagery." (6.)
NN	Neural Networks	"A type of DL" ... [engineered] ..."to solve a specific task like image classification. (6.)
AN	Artificial Neuron	"The main constituent of any NN" ; [it] "is a mathematical non-linear model that was inspired by the human neuron." (6.)
	Classification Task	"During the training process, data points and corresponding labels are repetitively passed through the NN." (6.)
	Regression Task	During the training process, numerical results are repetitively passed through the NN." (6.)
XAI	Explainable AI	The use of "various methods... to visualize, interpret and explain what AI systems are doing."(6.)
	Hallucinations	More appropriately "Misinformation." Refers "to the generation of content that is not based on real or existing data but is instead produced by a machine learning model's extrapolation or creative interpretation of its training data."(20.) (14.)

Biological Neuron; Human Brain



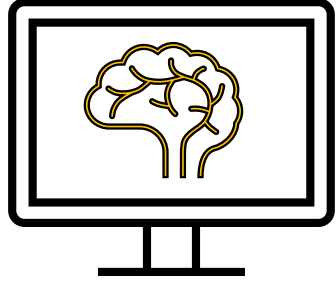
Human Brain

Artificial Neuron; Neural Network



NN

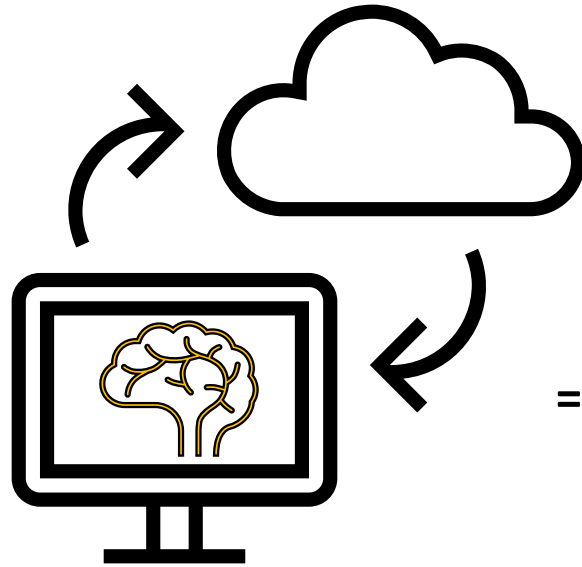
Neural Network



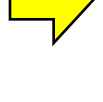
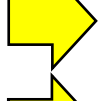
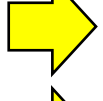
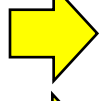
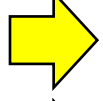
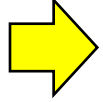
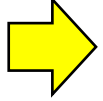
= Independent; Local



= Hallucination



= Internet Shared Data



CC	Cognitive Computing	"the use of computer systems to simulate human thought processes." (8.)
CV	Computer Vision	"uses [DL] to recognize patterns in images and videos." (8.)
ES	Expert Systems	Encode "human expert knowledge into explicit rules." (8.)
NLP	Natural Language Processing	"the use of AI/Aul to recognize ideas in speech and written language and to capture these ideas as digital data elements as well as to communicate with system users in ordinary language." (8.)
NNL	Neural Network Learning	A process in which "each input sample is tagged with a desired result and contributes to this training." (8.)
	Ground Truth	"Gold standard classification." "The accuracy of a training set's classification for supervised learning." (8.)
	Training Dataset	"provide[s] examples of the kinds of finding the network is to detect." (8.)
	Validation Dataset	Involves "testing against a [different] dataset of test cases, which operate as a gold standard." "It is critical that...expected findings be correct." (8.)
	Testing Dataset	" a 'holdout dataset' ...never before seen by the algorithm"... "used to verify the algorithm's ability to perform on new data." (8.)
	Specificity	Requires "the rate of false positives [to be] very low." (8.)
	Sensitivity	Requires "the rate of false negatives [to be] very low." (8.)

6. Schwendicke F, Samek W, Krois J. Artificial Intelligence in Dentistry: Chances and Challenges. J Dent Res. 2020 Jul;99(7):769-774.

8. American Dental Association SCDI White Paper No. 1106, Dentistry-Overview of Artificial Intelligence Uses in Dentistry.

14. UAB IT hosted Google execs and AI experts for series of AI meetings.

15. <https://www.britannica.com/science/algorithm>

Supervised Learning System Validation

YES +
NO -
FALSE +
FALSE -

Sensitivity has fewer False - (e.g. for screening)
Specificity has fewer False + (e.g. for face ID)



TRAINING DATASET

VALIDATION DATASET

TESTING DATASET

Data Tagger:
GROUND TRUTH

Program Intended Use

AI	Artificial Intelligence
Aul	Augmented Intelligence
ML	Machine Learning
Algorithm	
DL	Deep Learning
NN	Neural Networks
AN	Artificial Neuron
	Classification Task
	Regression Task
XAI	Explainable AI
	Hallucinations
CC	Cognitive Computing
CV	Computer Vision
ES	Expert Systems
NLP	Natural Language Processing
NNL	Neural Network Learning
	Ground Truth
	Training Dataset
	Validation Dataset
	Testing Dataset
	Specificity
	Sensitivity


ChatGPT Generated Content:

Image Creation Request ...

Ethics in Dentistry AI

PowerPoint Outline Creation

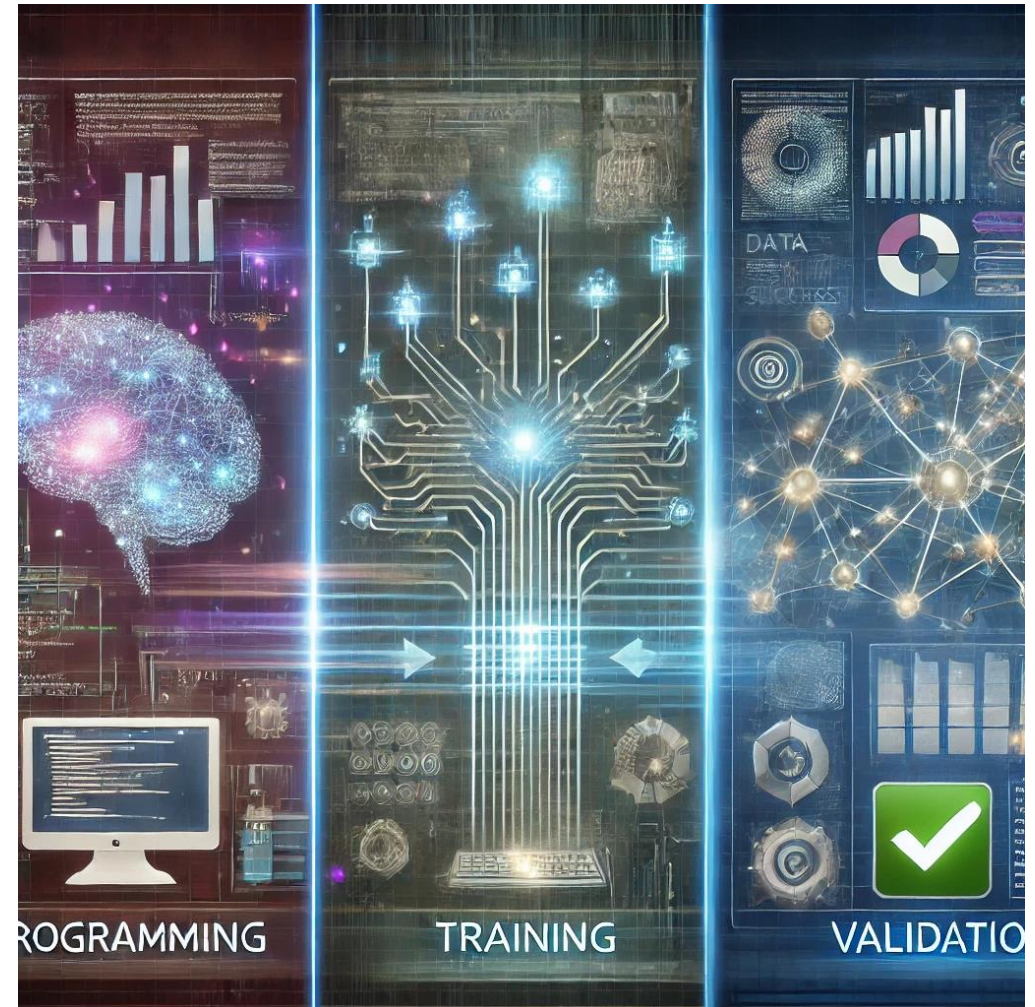
I would like to create an image highlighting the programming, training, and validation of AI software



Message ChatGPT

Upgrade plan

ChatGPT can make mistakes. Check important info.



AI and Ethics in Several Popular Applications

Dr. Dan Givan
Professor/
Associate
Dean
Prosthodontics
UAB SOD

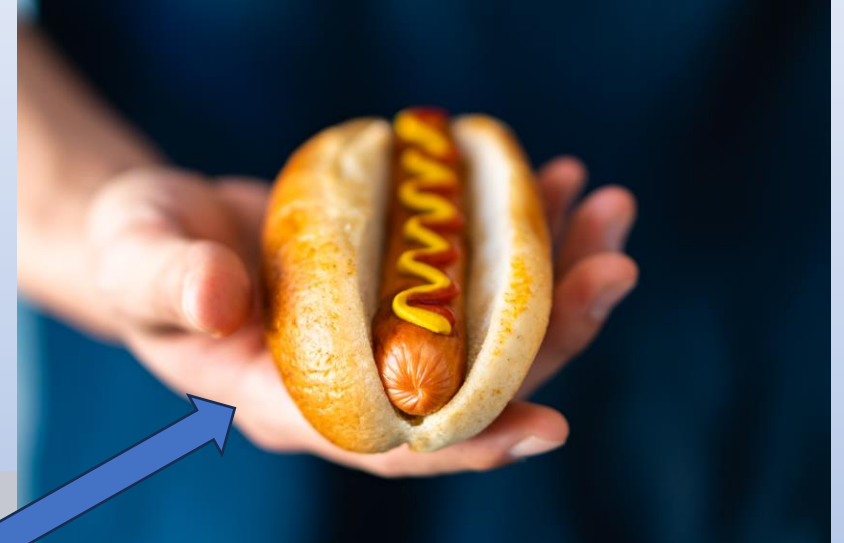
In digital dentistry,

“mistakes are easier and faster to make,
and they are harder to find.”

This “requires new understanding to prevent them.”

AI and Ethics in Several Popular Applications

“Trust
and
Verify”



AI in Dental Software Applications

Human Factors to Consider

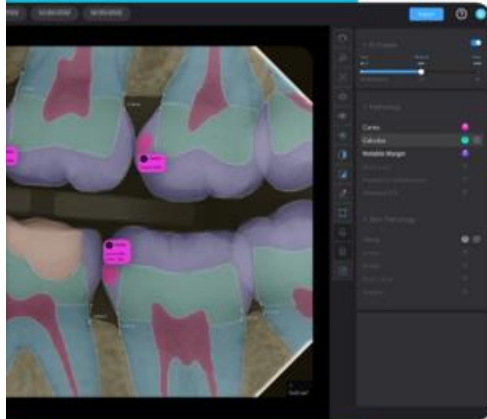
Radiographic technique,
overlap, angulation

Hardware Factors to Consider

Condition of sensors,
phosphor plates

Old school radiographic
resolution compared to digital



Radiology Analysis Software (Pearl AI- AI-Caries Detection)



hellopearl.com

Second Opinion®

AI-powered instant pathology detection to ensure you catch even the hardest-to-spot conditions in your patient's x-rays.

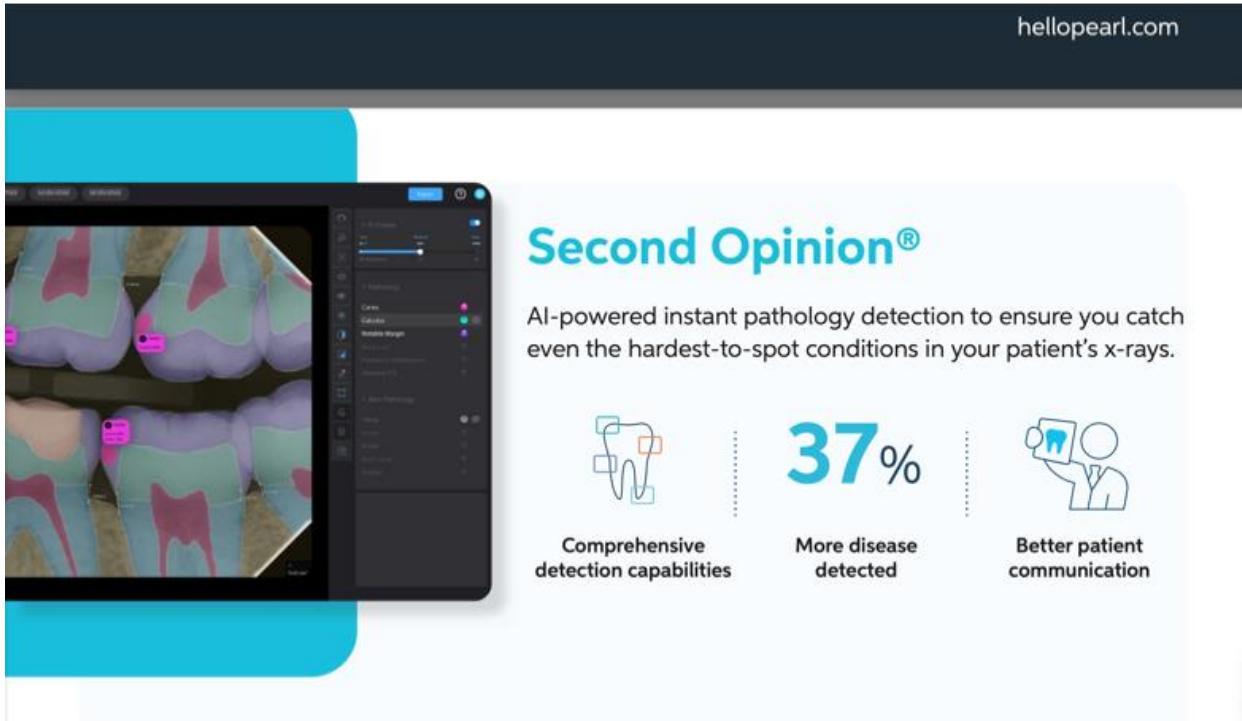
-  Comprehensive detection capabilities
- 37%** More disease detected
-  Better patient communication

AI in Dental Software Applications

2. Mertens S, Krois J, Cantu AG, Arsiwala LT, Schwendicke F. Artificial intelligence for caries detection: Randomized trial. J Dent. 2021 Dec;115:103849. doi: 10.1016/j.jdent.2021.103849. Epub 2021 Oct 14. PMID: 34656656.

- “their **sensitivity** was significantly **higher** ... while the specificity was not significantly affected.”
- “increase in sensitivity was found **for enamel**, but not early or advanced dentin lesions.”
- "AI can increase dentists' diagnostic accuracy but **may also increase invasive treatment** decisions."



Radiology Analysis Software (Pearl AI-Caries Detection)



hellopearl.com

Second Opinion®

AI-powered instant pathology detection to ensure you catch even the hardest-to-spot conditions in your patient's x-rays.

-  Comprehensive detection capabilities
- 37%** More disease detected
-  Better patient communication

AI in Dental Software Applications

Human Factors to Consider

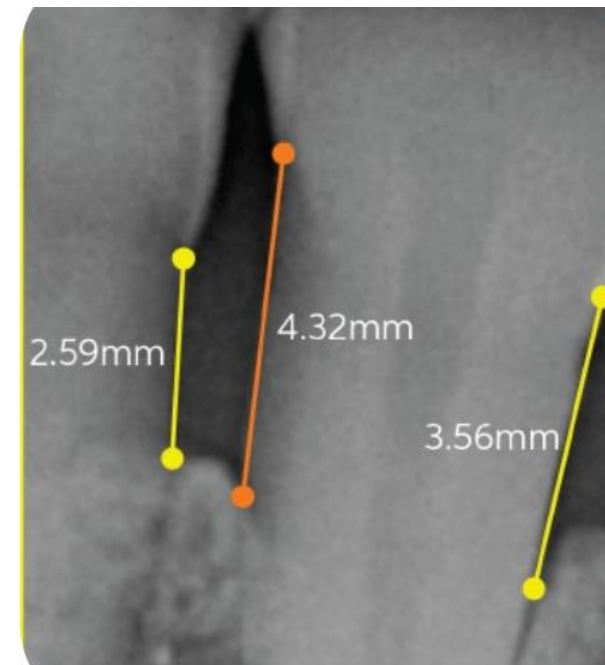
Radiographic technique,
overlap, angulation

Hardware Factors to Consider

Condition of sensors,
phosphor plates

Old school radiographic
resolution compared to digital

Radiology Analysis Software (Pearl AI- Periodontal Application)

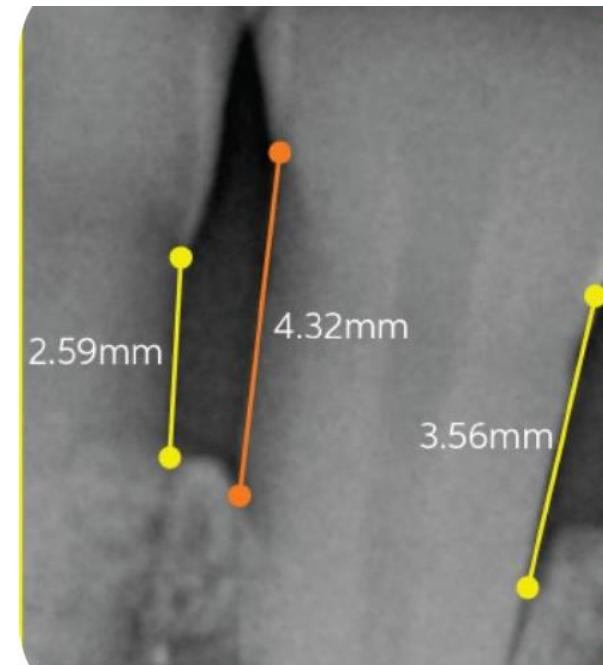


AI in Dental Software Applications

4. Khan A, Khan KJ, Ghaza MA, Dave T, Shahnoor S, Khan AM, Oduoye MO, Nafula WP, Ubechu SC. Celebrating breakthrough in dental diagnostics: FDA approval of an AI model for diagnosis of periodontal diseases: A correspondence. Health Sci Rep. 2023 Sep 18;6(9):e1573. doi: 10.1002/hsr2.1573. PMID: 37732105; PMCID: PMC10507281.

- **Videa Perio Assist (VPA)** [not Pearl AI]
- “is a cloud-based, AI powered software that automatically measures and visualizes bone levels associated with each tooth from radiographic images.”
- “has demonstrated VPA's efficacy in accurately diagnosing periodontal diseases with high sensitivity and specificity.”

Radiology Analysis Software (Pearl AI- Periodontal Application)

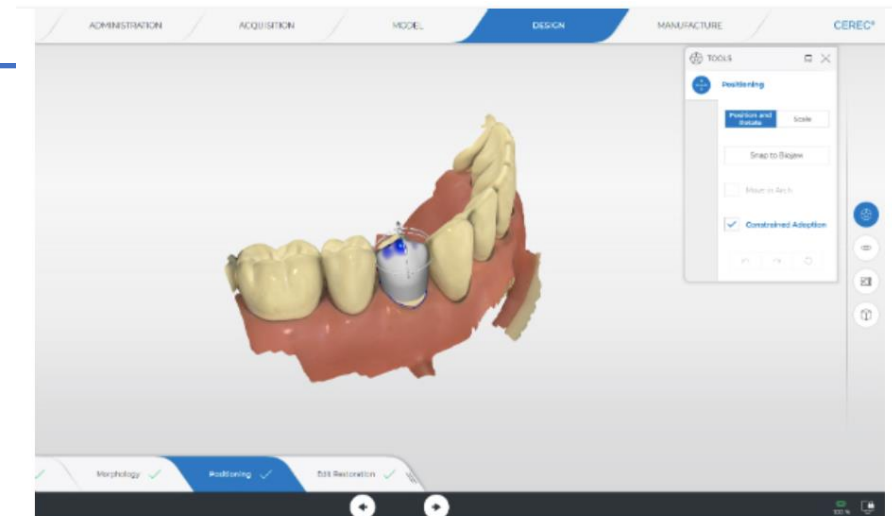


AI in Dental Software Applications

Human Factors to Consider

- Scan of margins, interproximal contacts
- Verify bite
- Evaluate adequate reduction for material thickness
- Knowledge of material requirements, connectors, manufacturing
- Verify proposal
- Verify at delivery margins, contour, occlusion; pre and post-delivery radiograph

CEREC CAD CAM Software



Biojaw

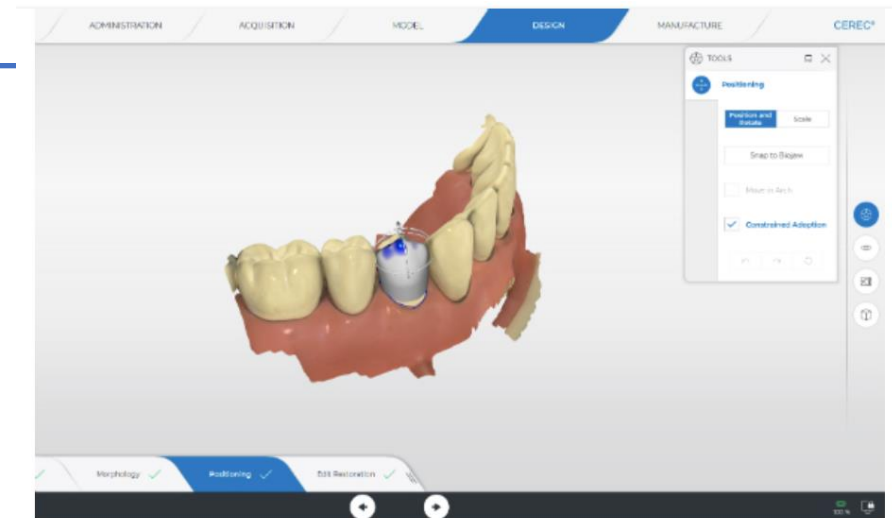
An important feature of the CEREC Software is the unique “Biojaw algorithm”. The software uses a biostatistical procedure to calculate a patient-specific initial restoration proposal based on the scanned teeth. This proposal is usually sufficient to start the production process.

AI in Dental Software Applications

Hardware Factors to Consider

- calibrated scanner with validated full arch accuracy

CEREC CAD CAM Software



Biojaw

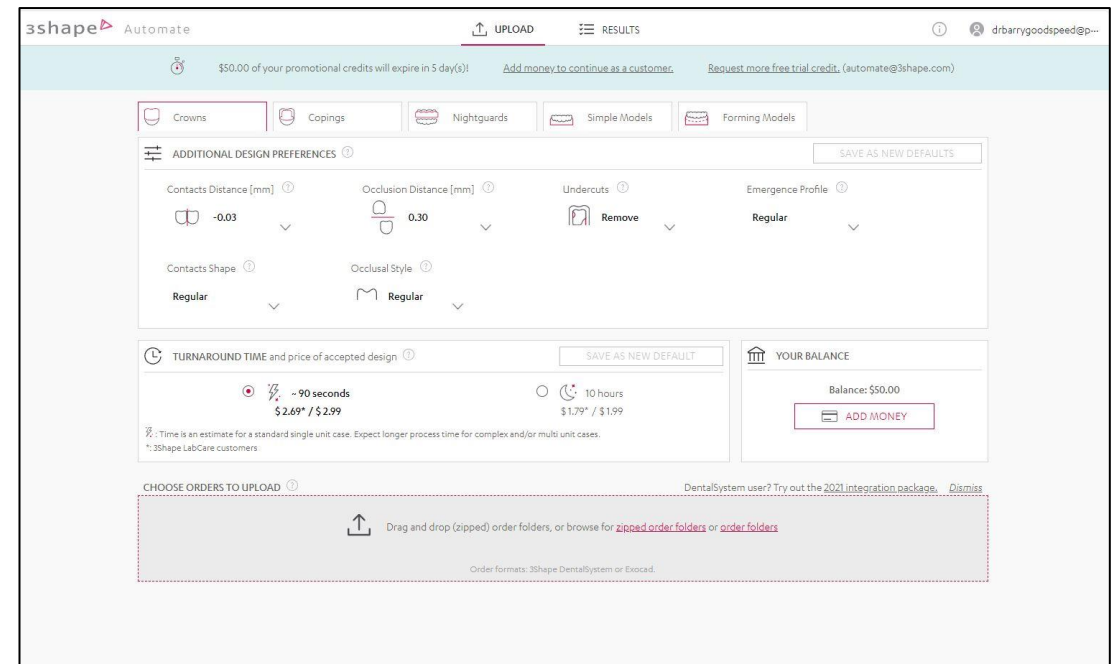
An important feature of the CEREC Software is the unique “Biojaw algorithm”. The software uses a biostatistical procedure to calculate a patient-specific initial restoration proposal based on the scanned teeth. This proposal is usually sufficient to start the production process.

AI in Dental Software Applications

7. Wu Z, Zhang C, Ye X, Dai Y, Zhao J, Zhao W, Zheng Y. Comparison of the Efficacy of Artificial Intelligence-Powered Software in Crown Design: An In Vitro Study. *Int Dent J*. 2024 Jul 28:S0020-6539(24)00196-5. doi: 10.1016/j.identj.2024.06.023. Epub ahead of print. PMID: 39069456.

- "AI-powered software enhanced the efficiency of crown design but failed to excel at morphological accuracy compared with experienced technicians using computer-aided software."

3Shape Automate Crown Software



AI in Dental Software Applications

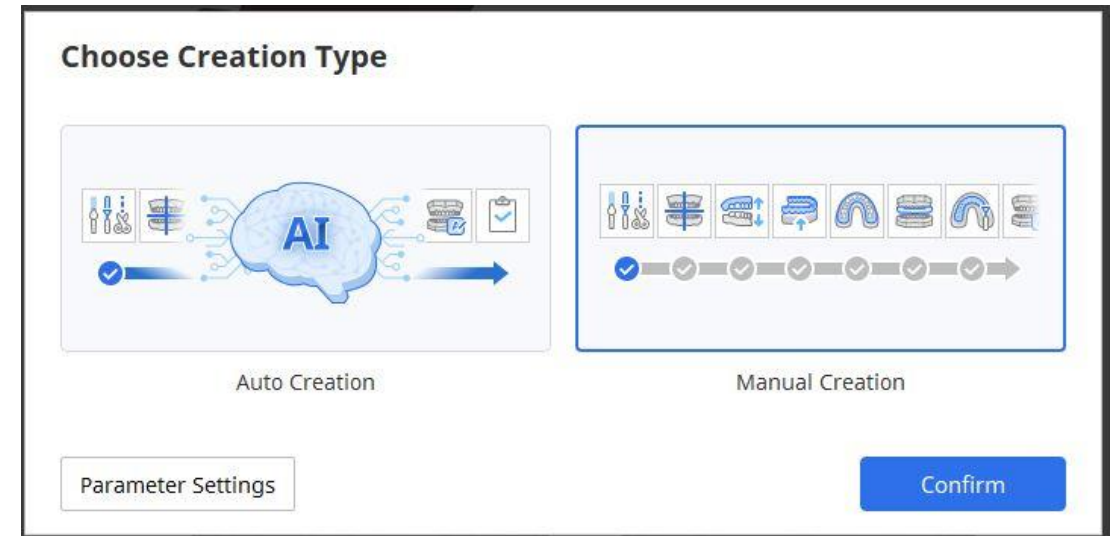
Human Factors to Consider

- Accurate scan, VDO Bite, Model axis
- Knowledge of material requirements, software parameters
- Design tweaks
- delivery + follow up adjustments

Hardware Factors to Consider

- Printer calibration
- resin processing
- initial printed model verification

Splint Software (Medit)

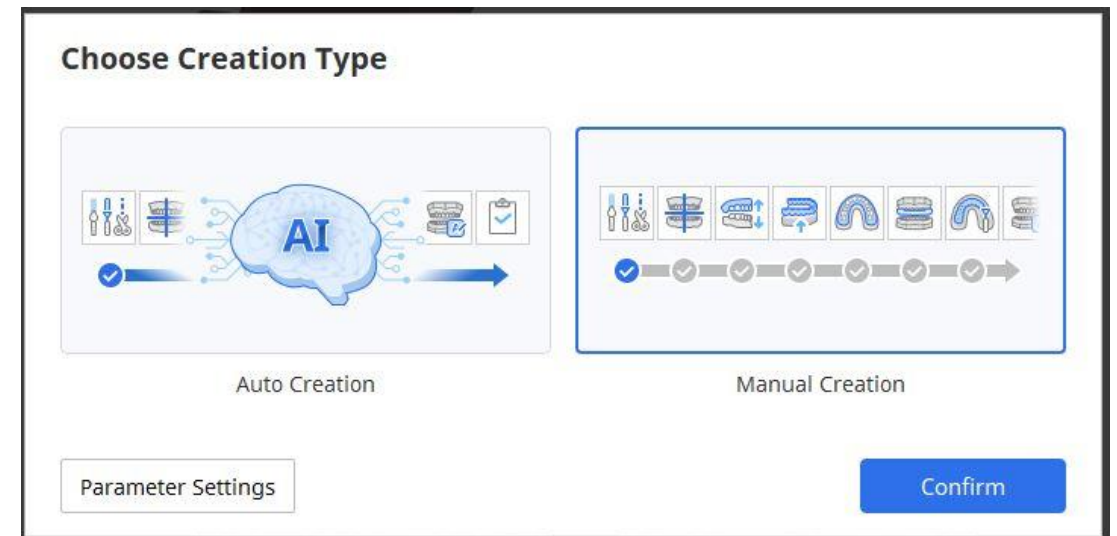


AI in Dental Software Applications

6. Kois JC, Zeitler JM, Barmak AB, Yilmaz B, Gómez-Polo M, Revilla-León M. Discrepancies in the occlusal devices designed by an experienced dental laboratory technician and by 2 artificial intelligence-based automatic programs. J Prosthet Dent. 2023 Oct 3:S0022-3913(23)00551-6. doi: 10.1016/j.prosdent.2023.08.015. Epub ahead of print. PMID: 37798183.

- "The AI-based software programs tested were able to automatically design occlusal devices with less than a 100- μ m trueness discrepancy compared with the dental laboratory technician."

Splint Software (Medit)

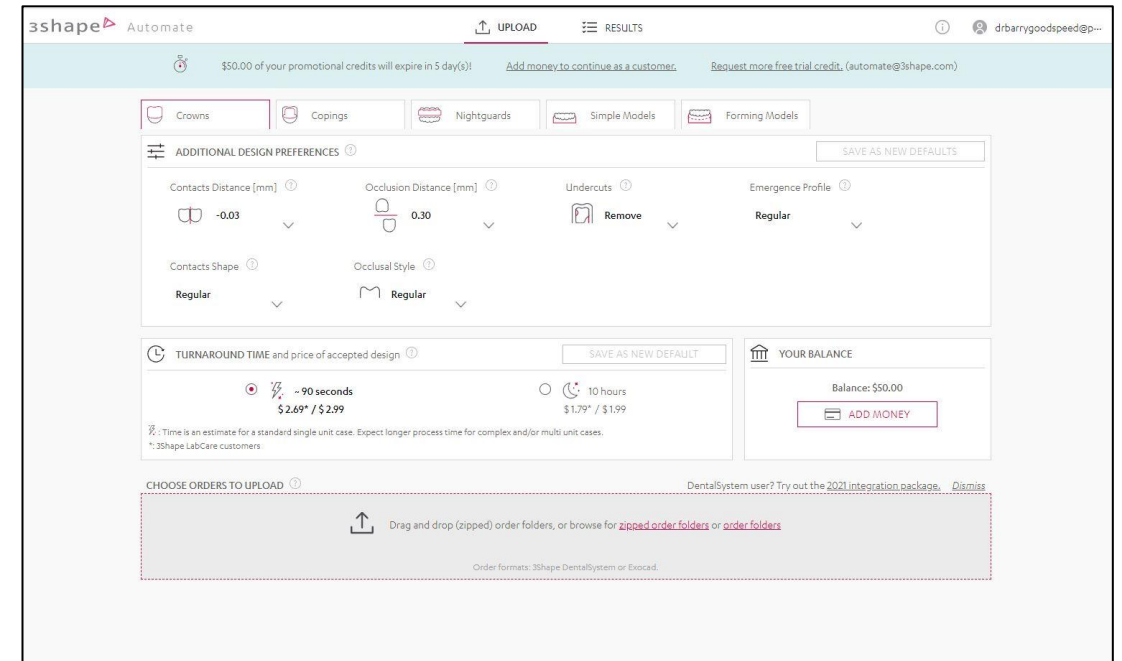


AI in Dental Software Applications

6. Kois JC, Zeitler JM, Barmak AB, Yilmaz B, Gómez-Polo M, Revilla-León M. Discrepancies in the occlusal devices designed by an experienced dental laboratory technician and by 2 artificial intelligence-based automatic programs. *J Prosthet Dent.* 2023 Oct 3:S0022-3913(23)00551-6. doi: 10.1016/j.prosdent.2023.08.015. Epub ahead of print. PMID: 37798183.

- "The AI-based software programs tested were able to automatically design occlusal devices with less than a 100- μ m trueness discrepancy compared with the dental laboratory technician."

Splint Software (3Shape Automate)



AI in Dental Software Applications

Human Factors to Consider

- Training (CBCT, Surgical)
- Ability to verify IO scan to CBCT merge
- Experience and validation of guided surgery
- Case selection

Hardware Factors to Consider

- Accuracy of CBCT sensor and IO scanner

Implant Surgical guides
Sicat Rapid Guide

RAPID **DIGITALGUIDE**



SAVE THE DATE: Live-Webinar on AI Guide Designs & 3D Printing!

© 09:27 29 November

AI in Dental Software Applications

3. Wang J, Wang B, Liu YY, Luo YL, Wu YY, Xiang L, Yang XM, Qu YL, Tian TR, Man Y. Recent Advances in Digital Technology in Implant Dentistry. J Dent Res. 2024 Jul;103(8):787-799. doi: 10.1177/00220345241253794. Epub 2024 May 31. PMID: 38822563.

- "AI-supported preoperative planning and surgery remain in developmental phases, impeded by the complexity of clinical cases and ethical considerations, thereby constraining widespread adoption."

Implant Surgical guides Sicat Rapid Guide

 **DIGITAL**GUIDE



SAVE THE DATE: Live-Webinar on AI Guide Designs & 3D Printing!

© 09:27 29 November

AI in Dental Software Applications

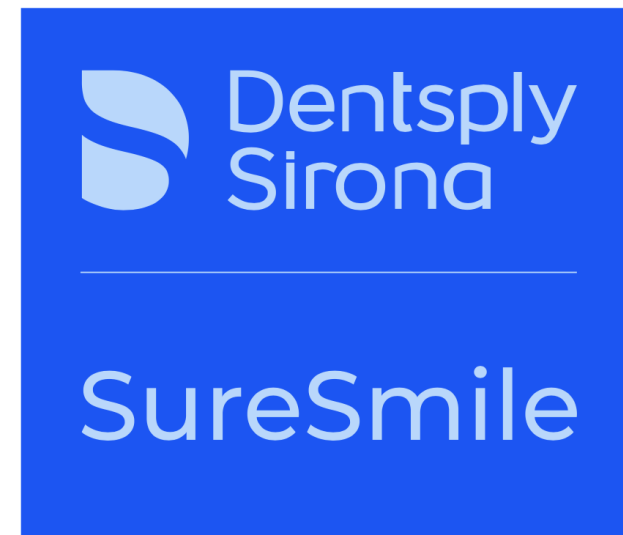
Human Factors to Consider

- Proper training
- Attachments
- Tracking of case, Patient Compliance
- Final equilibration

Hardware Factors to Consider

- Calibrated scanner with validated full arch accuracy

**Orthodontic Software
(SureSmile and Invisalign)**

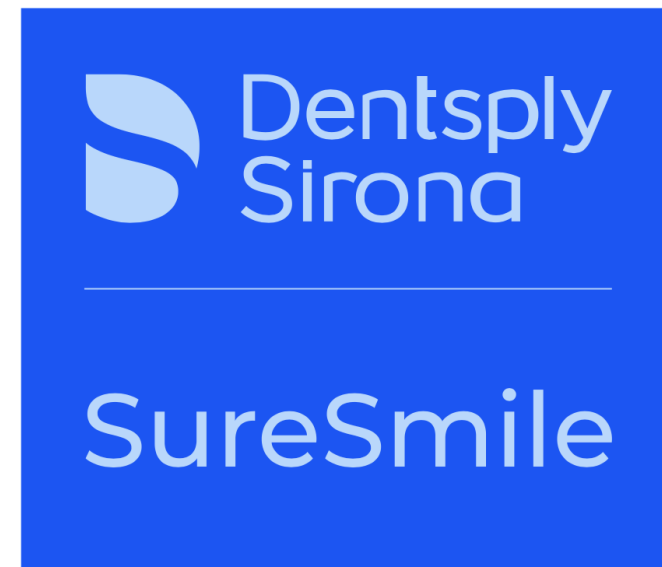


AI in Dental Software Applications

8. Fawaz P, Sayegh PE, Vannet BV. What is the current state of artificial intelligence applications in dentistry and orthodontics? J Stomatol Oral Maxillofac Surg. 2023 Oct;124(5):101524. doi: 10.1016/j.jormas.2023.101524. Epub 2023 Jun 1. PMID: 37270174.

- "Results from the various studies reported in this review are suggestive that the accuracy of AI-based systems is quite promising and reliable."

Orthodontic Software (SureSmile and Invisalign)



In Summary:

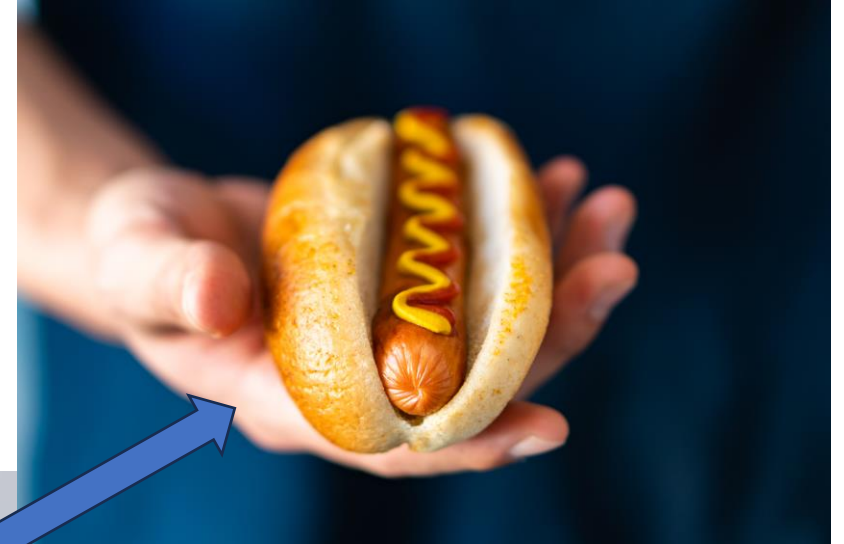
AI's Influence on Ethics in Dentistry

1. Shan T, Tay FR, Gu L. Application of Artificial Intelligence in Dentistry. J Dent Res. 2021 Mar;100(3):232-244. doi: 10.1177/0022034520969115. Epub 2020 Oct 29. PMID: 33118431.

" It is necessary to maintain a proactive attitude toward AI to ensure its affirmative development and promote human-technology rapport to revolutionize dental practice."

In Summary: *AI's Influence on Ethics in Dentistry*

“Trust
and
Verify”



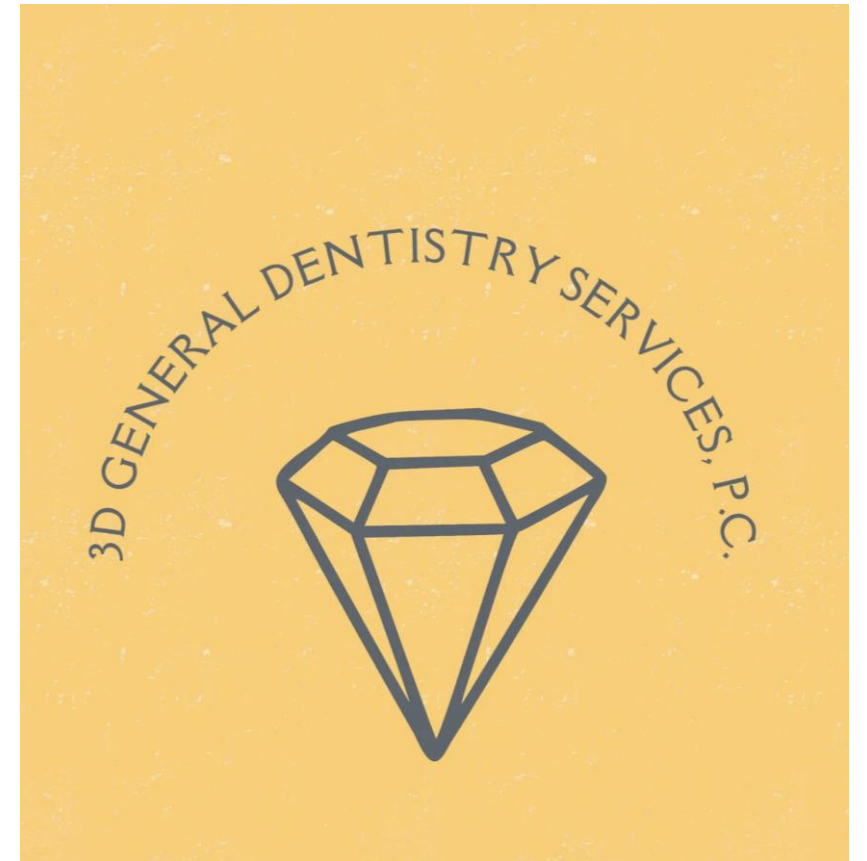
ETHICS IN DENTISTRY:

Discussion of the Hippocratic Oath, ADA Code of Ethics, and Artificial Intelligence

Objectives for You:

Analyze, adapt, and utilize AI as appropriate for you,
your practice, and our institutions...

Your Human Touch will always be valuable!!!



In a moment...
a Supplemental Summary for You!

Please dim the lights for this short video.



2025 ALUMNI WEEKEND FEBRUARY 6-9

The University of Alabama School of Dentistry Alumni Association

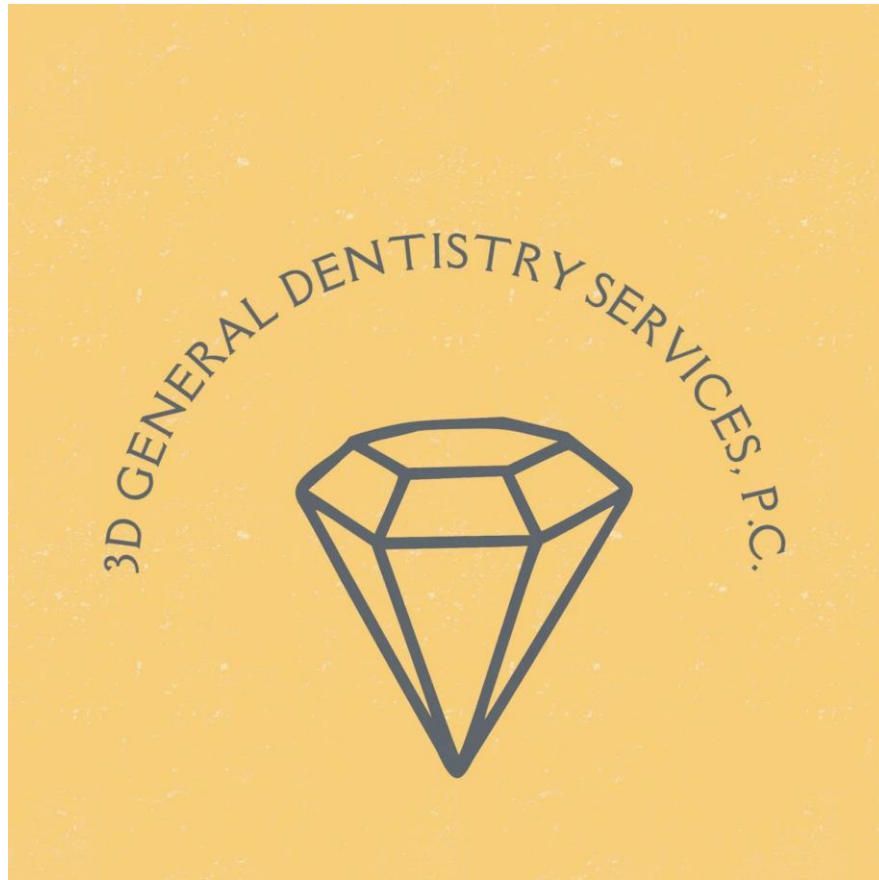
Thank You UAB Alumni Meeting!!!

Scott Huffman, UAB SOD Alumni Association Executive Director

Charlene Phillips, Development & Alumni Relations Coordinator

Kerry Chestnut, Ben Moffatt, Abby Vinson, Cherri West

Thank you for your attention!!!



Barry E. Goodspeed, DDS

3D General Dentistry Services, P.C.

Vestavia Hills, AL

205-907-1400

drbarrygoodspeed@protonmail.com

begoodsp@uab.edu

3DGDservices.com