

Evolving Role of the Clinical Team as AI Advances

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JANICE MACLEOD CONSULTING
Transforming Healthcare



Disclosures:
Consultant for WellDoc

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Healthcare isn't healthy




<https://www.cdc.gov/diabetes/data/country/cdcs.html>




<https://doi.org/10.2357/0119.0066> (50ser)

72 Days



Hacking Healthcare - Tom Lawry



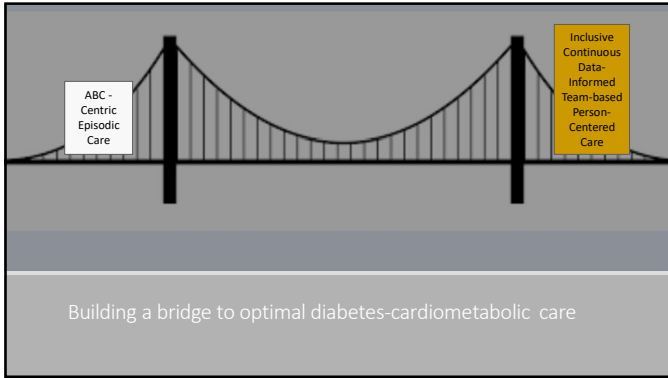
<https://www.cdc.gov/od/oc/2022/09/09/09-09-2022-08.html>

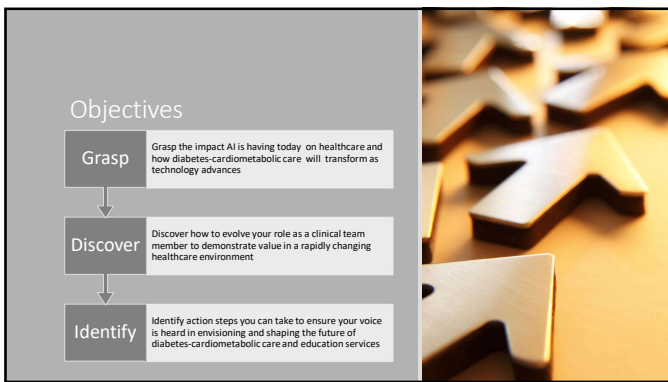


www.manuelhernandez.com

<https://www.Pi.org/resources/Pages/Publications/quantile-arms-for-health-care-improvement.aspx>





The Intelligent Health Revolution is here

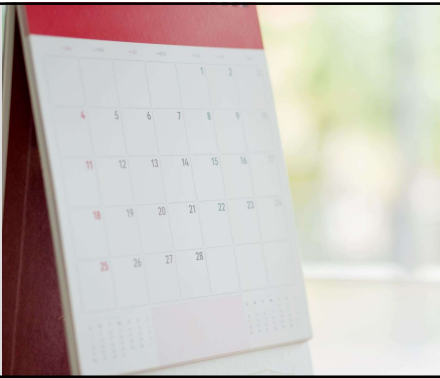
"AI is not the answer to fixing healthcare. Humans are."

"We were smart enough to create artificial intelligence, now we must harness it for the good it can do in health and medicine."

-Tom Lawry, Hacking Healthcare

When was the term *Artificial Intelligence* coined?

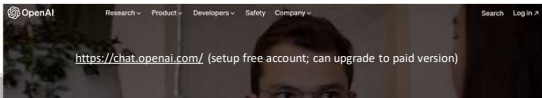
- 2022
- 2000 (Y2K)
- 1985
- 1956
- 1900

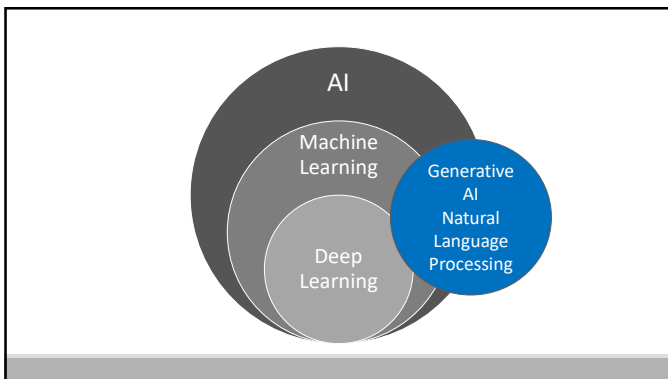


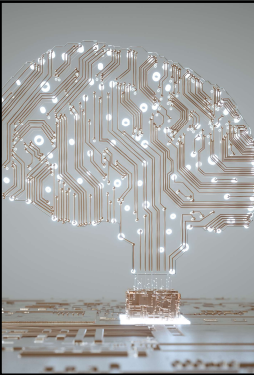
What is AI?

AI is software that learns; simulation of intelligent behavior in computers

- Machine Learning uses computational techniques that learn from examples vs. predefined rules
- Generative AI creates new content by looking at patterns and structure in sample data
 - LLMs Large Language models that can efficiently understand summarize, generate and predict text
 - Chat GPT – Generative Pre-trained Transformer - most popular LLM








Top AI Health Trends


- Robotics Process Automation (Operations, Administrative)
- Revolutionizing Drug Discovery
- Smart Pills and Diagnostics
- Interpreting Radiology and Pathology Scans
- Ambient AI; Care Anywhere; Hospital at Home (HaH)
 - <https://www.ama-assn.org/system/files/health-at-home-models.pdf>
- Emotion AI; Mental Health
- Data-Informed Personalized Care (Internet of Things)
- Chronic Condition Diagnosis and Management

Practical Uses Occurring Now




Medical Documentation (Keyboard liberation)

- Chart notes & biopsies
- Prior authorizations




Automating Routine Administrative Tasks

- Scheduling, Reminders, billing, detecting fraud, optimizing staffing, limit no-shows.



Generate menu plans

- 2000 kcal, gluten free, <60g carbohydrate/meal; 2 snacks



Provide lab results with explanation and schedule appointment

Asking questions: Does my insurance plan cover [X] (medication, technology, DSMES, etc.); summarize research articles

Request Prior Auth Letter for Ozempic

Request

Write a letter to my patient's insurance company explaining why they should approve Ozempic for the treatment of type 2 diabetes. My patient has not been successful using Glipizide or Pioglitazone. Even though the patient takes Metformin, they still need additional hbA1c lowering to reach goal. The patient would also benefit from weight loss with the help of Ozempic. Start the letter by explaining type 2 diabetes, and discuss why hbA1c lowering is a goal of therapy. Also explain the benefits of using Ozempic to assist in weight loss and how that will improve treatment outcomes. Please incorporate references that include scientific research.

AI Generated Prior Auth Letter

Response

I am writing to request approval for my patient to receive treatment with Ozempic for their type 2 diabetes. My patient has been struggling to control their blood sugar levels despite previous treatment with Glipizide and Pioglitazone and is in need of additional therapy to reach their treatment goals.

Type 2 diabetes is a chronic condition characterized by high levels of glucose in the blood. The primary goal of therapy for type 2 diabetes is to lower hemoglobin A1c (HbA1c) levels, which reflect average blood sugar control over the past 2-3 months. HbA1c lowering is important because elevated blood sugar levels increase the risk of serious complications such as heart disease, nerve damage, kidney disease, and blindness.

Ozempic is a glucagon-like peptide-1 (GLP-1) receptor agonist that has been shown to effectively lower HbA1c levels and improve glucose control in patients with type 2 diabetes. In addition, Ozempic has been shown to assist with weight loss, which is an important consideration for my patient. Obesity is a risk factor for the development of type 2 diabetes, and weight loss can improve insulin sensitivity and glycemic control.

Studies have shown that treatment with Ozempic leads to significant HbA1c reductions and weight loss compared to placebo. In the SUSTAIN 6 trial, treatment with Ozempic led to a mean HbA1c reduction of 1.4% and a mean weight loss of 4.8 kg at 52 weeks, compared to 0.9% HbA1c reduction and 2.3 kg weight loss with placebo (Buse et al., 2016). In the REWIND trial, treatment with Ozempic was associated with a mean HbA1c reduction of 1.2% and a mean weight loss of 5.8 kg at 66 weeks, compared to 0.7% HbA1c reduction and 2.2 kg weight loss with placebo (Rosenstock et al., 2016).

In conclusion, I strongly believe that my patient will benefit from treatment with Ozempic. Ozempic has been shown to effectively lower HbA1c levels and assist with weight loss, which are important considerations for my patient in reaching their treatment goals. I would greatly appreciate your prompt approval of this request.

Sincerely,

[Your Name]

AI Request: Explain Lab Results to Patient

Request

Tell my patient they have a triglyceride levels of 350, LDL level of 210, a hba1c of 8.1, a SCr of 2.1, and an HDL level of 17. Explain to them what this means.

AI Response:

Response

Triglycerides: Triglycerides are a type of fat found in the blood and are measured in milligrams per deciliter (mg/dL). A level of 350 mg/dL is considered high and is a risk factor for heart disease.

LDL Cholesterol: LDL cholesterol, also known as the "bad" cholesterol, helps transport cholesterol from the liver to other parts of the body. A level of 210 mg/dL is considered very high and increases the risk of heart disease and stroke.

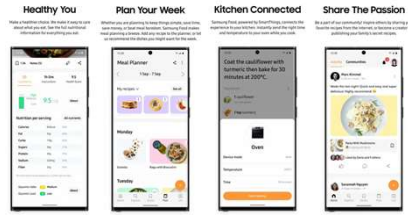
HbA1c: HbA1c is a measure of average blood sugar control over the past 2-3 months. An HbA1c level of 8.1% is higher than the target range (less than 7%) and indicates uncontrolled diabetes or pre-diabetes.

SCr: Serum creatinine (SCr) is a measure of kidney function. A level of 2.1 milligrams per deciliter (mg/dL) is within the normal range, but can be elevated in certain conditions such as kidney disease or dehydration.

HDL Cholesterol: HDL cholesterol, also known as the "good" cholesterol, helps remove excess cholesterol from the bloodstream. A level of 17 mg/dL is considered low and increases the risk of heart disease.

It is important for your patient to work with their healthcare provider to develop a plan for managing these levels and reducing the risk of heart disease and other health conditions. This may include lifestyle changes such as a healthy diet and regular exercise, as well as medications as needed.

Consumer Facing: Samsung Food



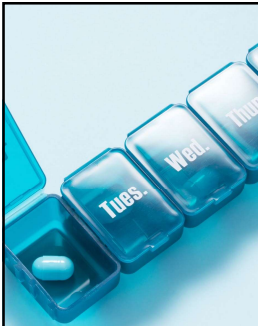
<https://www.theverge.com/2023/8/11/23853978/samsung-food-app-smart-kitchen-ff-2023>

Red flags



- Risk of incorrect and falsified responses.
- Training dataset limitations
- Lack of knowledge-based reasoning.
- LLMs are not currently regulated.
- Patient privacy and cybersecurity concerns.
- Risk of bias, discrimination, and promoting stereotypes.

How ChatGPT works (or doesn't work)

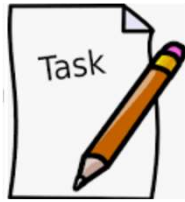


"It isn't a machine that knows things. All it knows is the information about the distribution of words."

"So, if someone asks *'what's the best treatment for diabetes?'* the technology might respond with the name of the diabetes drug *'metformin'* – not because it's necessarily the best but because it's a word that often appears alongside *'diabetes treatment'*."

This is not the same as a reasoned response.

Will AI take my job?

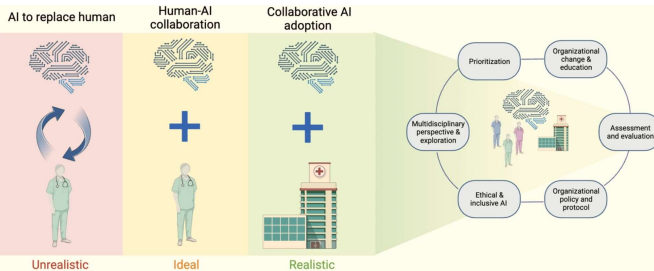


vs.



<https://www.linkedin.com/pulse/healthy-eating-diabetes-person-list-foods-avoid-janice/>

Combining the cognitive strengths of HCPs with AI's analytical capabilities



Enma Saez (2023). Artificial intelligence in healthcare: Complementing, not replacing, doctors and healthcare providers. Digital Health, 9, 1-5. DOI: 10.1177/20552076231186520

"... AI can't perform a task if you don't know how to do it yourself.

We humans need to ask the right questions so the AI can provide the right answer.

The real art of medicine will then involve deciphering the logical path that led AI to a specific solution, requiring high levels of creativity, problem-solving and cognitive skills.

AI frees medical professional to focus on higher-order thinking, complex problem solving and more empathetic patient care – all fertile grounds for creativity."

-Bertlan Metsco, The Medical Futurist

Asking the right questions

MEDICALFUTURIST.COM

author: Benjamin Medick, TheMedicalFuturist

<https://www.linkedin.com/in/bernalamesko/recent-activity/all/>

SPECIFIC PROMPT RECOMMENDATIONS

- 1. The more specific your prompt is, the more accurate the response is likely to be.**
Less specific: "Tell me about heart disease."
More specific: "What are the most common risk factors for coronary artery disease?"
Example: Fin writing an article about tips and tricks for ChatGPT, prompt engineering people working in healthcare. Can you please list a few of those tips/articles with some specific prompt examples?"
- 2. Describe your setting and provide the context!**
Example: "Act as a Data Scientist and explain Recent Engineering in AI." "Act as my nephrologist and give me the most common treatment Myocardial infarction."
- 3. Experiment with different prompt styles!**
Direct Question: "What are the symptoms of COVID-19?" Request for List: "List all of the general symptoms of COVID-19." Request for Summary: "Summarize the key symptoms and complications of COVID-19." Explain the symptoms of COVID-19 like you're...
- 4. Identify the overall goal of your prompt first!**
Example: "I'd like to get a short list of 5 ideas for a Youtube video on the future of healthcare AI."
- 5. Ask ChatGPT to play roles!**
Example: "Act as a Data Scientist and explain Recent Engineering in AI." "Act as my nephrologist and give me the most common treatment Myocardial infarction." "Act as a Dietitian and explain the benefits of intermittent fasting for weight loss." "Act as my nephrologist and give me the most common treatment Myocardial infarction."
- 6. Iterate and refine your question and ask ChatGPT to modify the output based on its previous response.**
Initial prompt: "How are you feeling today?" Refined prompt: "You're a male of 5'10, how would you rate your stress levels today and what specific event contributed to it?"
- 7. Use threads**
You can easily go back to a specific discussion by clicking on the proper thread in the left column. This way, you don't have to start all over again, but use past sessions or discussions you already had with ChatGPT.
- 8. Ask Open-ended Questions as those often yield more comprehensive responses.**
Closed question: "Is exercise treatment for patients with intervertebral disc disease?" Open question: "What does regular physical activity benefit patients with intervertebral disc disease?"
- 9. Request specific examples**
If there is something you are not satisfied with or don't understand based on its response, list it and ask ChatGPT that you don't understand the answer and ask it to provide an example.
Initial prompt: "Could you explain the common side effects of the medication?" Refined prompt: "How does it affect the side effects of this medication. Can you provide specific examples of common side effects patients..."
- 10. If you're asking about a process or timeline, specify that in your prompt.**
Without time reference: "Search for the leading process after new surgery." With time reference: "What are a research trends expected during the first six weeks of leading after new surgery?"
- 11. Add the +1, Set Realistic Expectations**
Unrealistic Prompt: "What's the latest research published this month about Alzheimer's?" Realistic Prompt: "What were some of the major research breakthroughs in Alzheimer's treatment in 2022?"

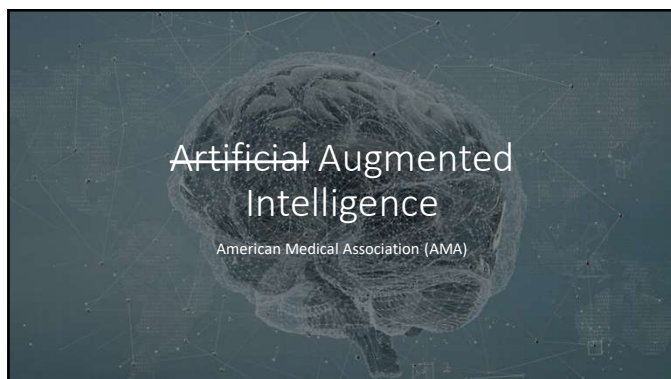
Healthcare GPT Cheat Sheet

Harvey Castro, MD, MBA.
ChatGPT Healthcare Advisor - Physician with Executive MBA + AI in Healthcare Author for CCO & Physicians, aiding in AI's Healthcare integration. Empowering physicians, patients, authoring the AI in Healthcare revolution.

https://www.linkedin.com/post/harveycastro_md_chatgpthealthcare-the-topodcast-harveycastro-md-activity-7090635508002811904-3hxxw/

The cheat sheet covers various topics including:

- Healthcare Chatbot**: Tips for developing, training, and evaluating chatbots.
- AI in Patient Care**: Applications in diagnosis, treatment, and patient engagement.
- AI in Research**: Accelerating drug discovery and clinical trials.
- AI in Administration**: Streamlining workflows and reducing costs.
- AI in Education**: Personalized learning and medical simulation.
- Ethical Considerations**: Privacy, bias, and transparency.



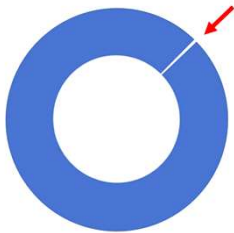
Healthcare → Healthcare

“the greatest opportunity offered by AI... is the opportunity to restore the precious and time-honored connection and trust between patients and doctors.”

-Eric Topol, MD
Deep Medicine



The Art of Medicine




www.manuelhernandez.com



“The technology won’t replace doctors, but doctors who use AI will probably replace doctors who don’t use AI.”

“While chatbots and other AI technologies hold tremendous promise in healthcare, they need guardrails and guidelines for use. I wouldn’t release it without that oversight”.

- Dr. John Halamka, President of Mayo Clinic Platform and part of the Coalition for Health AI



Coalition for Health AI (CHAI)

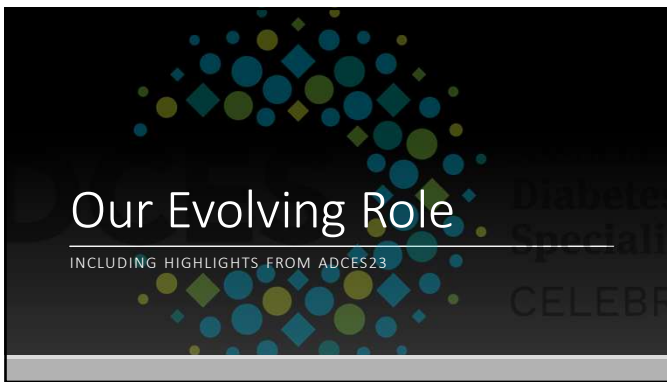
Purpose: A community of academic health systems, organizations, and expert practitioners of AI and data science to harmonize standards and reporting for health AI and educate end-users on how to evaluate these technologies to drive their adoption.

Mission: To provide guidelines regarding an ever-evolving landscape of health AI tools to ensure high quality care, increase credibility amongst users, and meet health care needs

BLUEPRINT FOR TRUSTWORTHY AI IMPLEMENTATION GUIDANCE AND ASSURANCE FOR HEALTHCARE
 COALITION FOR HEALTH AI
 Version 1.0 - April 04, 2023

Published: April 2023; Open for comment

<https://coalitionforhealthai.org/> American Board of Artificial Intelligence in Medicine <https://abaim.org/>



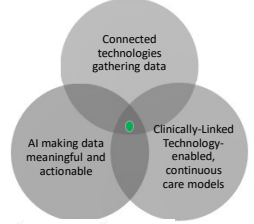
Our Evolving Role

INCLUDING HIGHLIGHTS FROM ADCES23

AI & Diabetes Care


- Automated Insulin Delivery
- CGM & Data Visualization
- Connected Insulin Pens and Smart Dosing Algorithms
- Diabetes Coaching Apps
- Retinopathy diagnosis
- Neuropathy diagnosis and care
- Meal Planning
- EMR data extraction, discovery, & Smart Phrases

Will AI Further Enable Person-Centered Care?




ADCES2023 Technology COI Poster

Data-Informed personalized, care for populations at scale



Population-level data identifies need for human touchpoints



Person-level data informs a productive conversation

ADCES Association of Diabetes Care & Education Specialists CELEBRATING 50 YEARS

... In-app annotations, coupled with sentiment analysis, could be useful for a DCES to help people with diabetes better cope with and manage diabetes distress. Future work will explore the use of AI-based natural language processing and sentiment classifiers to increase the levels of precision and personalization that can be realized with scalable digital health coaching

A Real-Time CGM-Enabled Digital Health Tool Highlights a Relationship Between Sentiment and Diabetes Distress

People: M. Shorrot, M. Kumbarkar, A. Ner, A. Park, L. Atoggo, G. A Real-Time CGM-Enabled Digital Health Tool Highlights a Relationship Between Sentiment and Diabetes Distress in People Using Bolus Insulin. Presented at the Association of Diabetes Care and Education Specialists Meeting, Houston, TX, August 4-7, 2023

ADCES Association of Diabetes Care & Education Specialists CELEBRATING 50 YEARS

Milton

ADCES Association of Diabetes Care & Education Specialists CELEBRATING 50 YEARS

Miguel Johns - 1st
The Diabetes Moments App & Milton AI
2w • 🌐

We call him Milton and he is officially live for texting. A diabetes "assistant coach" that supports patients between touchpoints with their educator, RD, or provider.

#diabetesmanagement #diabetes

Virtual GDM Management and Support

DIAGNOSED WITH GESTATIONAL DIABETES?
A TRACKING APP MADE JUST FOR YOU!

DIABETES CARE IS INEFFICIENT. Reduce time and improve outcomes.

ADCES Association of Diabetes Care & Education Specialists CELEBRATING 50 YEARS

<https://heymalama.co/>

Providing Whole Person Care Through a Virtual Diabetes Speciality Clinic

Teresa McArthur, MS, RD, CDCES—SVP Clinical Services, Cecelia Health



Presented at ADCES 2023

Diabetes is an excellent example of a chronic disease that can be almost wholly **managed on a virtual basis**.

Virtual care provides access to a high level subspecialty care **regardless of where the participants may be located**.

The CDCES centric model allows a more efficient use of endo time and **allows broader access to care**.

The Virtual Clinic Model achieves **excellent clinical results** and has the potential to expand access to specialty care for people living with diabetes.

The model could be used for **multiple chronic diseases**.

Becoming a Diabetes Technology Champion – Building a technology workflow

Adapted from ADCES 2023 Presentation by Anastatia Albanese—O’Neil, PhD, APRN, CDCES, FADCES—JDRF International, ADCES DCES of the Year 2023




Changing healthcare landscape

Growing healthcare economy (aging population)
 Outcomes-focused, value driven; cost savings vs. transactional (reimbursement)
 Upstream, proactive, preventive approach vs. reactive disease management approach
 Personalized care from mass generalization to mass customization
 Technology enabled (AI-driven), data-informed, community linked; SDOH supported




Applying the Quintuple Aim as a Guiding Framework For Our Speciality’s Transition
 Kelly Rodriguez, RN, MSN, MBA, CDCES, FADCES—Parkland Health

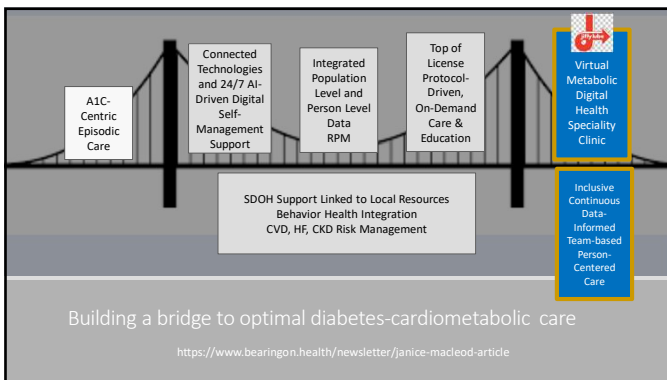
PRESENTED AT ADCES 2023



Other themes at ADCES23

- Practicing at top of license with protocol driven, clinic-approved standard orders following established standards of care
- Technology-enabled, data-informed remote patient monitoring programs enabling on-demand, continuous care and education services
- Virtual speciality clinics emerging supporting diabetes, obesity, related cardiometabolic conditions
- Team-based care; CDCES-led; linked to community to support SDOH





Action steps I can take

- Follow, listen, learn, join the conversation
 - Medicalfuturist.com, Tom Lawry, Eric Topol, AMA, Jan Berger Digital Innovations Newsletter . . .
 - If ADCES member, share your ideas and perspective on the Technology Community of Interest discussion board
 - Read the Blueprint for Trustworthy AI (CHAI) – should your organization be involved in CHAI?
- Bring value in every client/healthcare team interaction
 - e.g., negotiate a therapy change for a client on the wrong meds
- Make a list of every repetitive task you do over and over each day as you provide consultations, teach classes, document your visits. How could AI help?
 - Review the CHATGPT Prompt Infographic to refine your prompt questions and practice!
- Make a list of what you could do to help clients instead if your time was freed from the rote, repetitive tasks.
- Lean in. Embrace the change. Be part of the solution.




Janice MacLeod, MA, RD, CDCES, FADCES

Diabetes-Cardiometabolic Health Consultant

**Past Chair, Diabetes Practice Group
Academy of Nutrition and Dietetics**

**Association of Diabetes Care and Education Specialists
(ADCES) Board of Directors 2024-2027**

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