

Embracing the Digital Revolution in Osteopathic Medicine: Leveraging Technology to Enhance Patient Care and Practice Efficiency



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Continuing Medical Education

AMA PRA Category 1 Credits™ or AOA Category 1-A credit. ***Each 1-hour session is 1 CME credit.***

- This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of the American Osteopathic Association and the American Osteopathic Information Association (AOiA).
- The American Osteopathic Association is accredited by the ACCME to provide continuing medical education for physicians.
- AOiA is accredited by the American Osteopathic Association to provide osteopathic continuing medical education for physicians.

Today's Presenters



Dr. Sameer Sood, DO
CEO, FwdSlash
Healthtech Serial Entrepreneur
DHI CoP Steering Committee,
Co-Chair



Dr. David Shumway, DO
Capt, USAF MC
DHI CoP Steering Committee,
Member

Disclosures

Sameer Sood –

I have no relevant financial conflicts of interest to disclose.

David Shumway –

I have no relevant financial conflicts of interest to disclose.

The views expressed in this material are my own, and do not reflect the official policy or position of the U.S. Government, the Department of Defense, or the Department of the Air Force.

LLM AI was used in the production of this presentation, however all generated text was verified and edited by myself prior to publication.



Session Learning Objectives

1. Describe the newly launched AOiA digital health initiative and how collective action solves pain points and promotes innovation for the broader osteopathic profession.
2. Explain key digital health technologies and use cases most relevant to the full scope of osteopathic medicine.
3. Discuss potential implementation challenges and opportunities in adopting digital health technologies within an osteopathic practice.

Session Outline

- Overview of the AOiA Digital Health Innovation Community of Practice
- Opportunities & Challenges
- Use Case: Generative LLM AI in clinic
- Use Case: Wearable Devices, Remote Monitoring
- Discussion & Key Take-aways



Setting the Stage

- The most exciting time to practice osteopathic medicine is... *right now*.
- New and emerging technological advances in medicine promise to revolutionize patient care, improving outcomes while making osteopathic practice more efficient and sustainable.
- **What does that mean?** A promise to change the way we take care of patients forever, ensuring better treatment outcomes, efficiency, and work-life balance for osteopathic physicians.

Want to know how to get started? You've come to the right place!

Digital Health Initiative



Digital Health Innovation Community of Practice (DHI CoP) is advancing osteopathic voices in digital health and innovation



Founded in 2024 under the American Osteopathic Information Association (AOiA) leadership and governance



Governed by a steering committee of osteopathic community members, with support from AOiA



Primary goal is to integrate osteopathic principles into digital health advancement



A dynamic hub for continuous learning, collaboration, and networking to drive innovation, inform digital health policy, and promote the use of technology in alignment with osteopathic practice.



Offering accredited CME opportunities in digital health topics, curated by the leading voices and experts at the intersection of digital health and osteopathic medicine.



January 13, 2025:
Modernizing Osteopathic
Medicine: Advancing the Next
Frontier of DOs



Colby Holliday | *Managing
Director of Certification
Digital Medicine Society
(DiME)*



**Dr. Mark Zhang, DO, MMSc,
FAMIA** | *American Medicine
of Extended Reality
Association (AMXRA)*



March 3, 2025:
Implementation of Digital Health
Technologies: Ensuring Privacy &
Security, Safety and Usability



Steve Legault | *Director of
Knowledge, Learning, and
Assessment, ACOFP*



**Dr. Regan Stiegmann, DO,
MPH, FACLM, DipABLM** |
*Chief Medical Officer of
LPMLAB; Co-Director of
Digital Health Track of
Rocky Vista University
College of Osteopathic
Medicine*



Dr. Ravi Yarid, DO |
*Assistant Professor of
Osteopathic Manipulative
Medicine, Philadelphia
College of Osteopathic
Medicine*



May 12, 2025:
A Deeper Dive at Artificial
Intelligence in Healthcare and the
Impact on Osteopathic Medicine



**Dr. Bradley Thornock, PhD
MPH** | *Associate Professor
of Medical Humanities,
Rocky Vista University
College of Osteopathic
Medicine*



Dr. Timothy Tsai, DO, MMCI
| *Stanford School of
Medicine*

Opportunities & Challenges

- What can the Digital Health Innovation (DHI) Community of Practice (CoP) offer you?
- What questions or concerns do you have about digital health and AI technology?
- What digital or AI technologies do you use or are you considering using in your practice?

Use Case:

Large Language Models (LLM)
AI in Clinic



What is Artificial Intelligence?

- Artificial Intelligence = simulation of human intelligence in machines
 - Allows them to perform tasks that typically require human-like cognitive functions
 - Can learn, reason, problem-solve, perceive, understand and produce language.
- Highly integrated into modern life:
 - Voice assistants, facial recognition, predictive text, driverless cars, automated tele-receptionists, anthropomorphic paper-clips.



Artificial Intelligence (AI) Terminology

- Narrow vs. General AI
 - **Narrow AI:** current/historical technology; designed to perform specific tasks
 - **General AI:** emerging/future technology; human-like intelligence that can learn, interpret, and apply knowledge to any domain.
- Machine Learning
 - **Deep Learning:** utilizes neural networks to analyze and learn from large amounts of data, often without explicit human understanding (“Black Box”).
 - **Reinforcement Learning:** utilizes human influence to guide AI development by using rewards or penalties based on its performance.

Artificial Intelligence (AI) Terminology

- **Natural Language Processing (NLP)**
 - The process of a computer reading, understanding, and interpreting human language.
 - Involves translation and production of language
- **Optical Character Recognition (OCR)**
 - Involves the detection and recognition of printed or handwritten characters
 - Converts photos, scanned images, and un-editable formats into editable and searchable text that can be accessed by a word processor
- **Ambient Dictation/Transcription**
 - Emerging application of LLM NLP in healthcare and legal settings; “AI Scribe”
 - Pairs voice recognition with NLP and generative AI functionality
- **Prompt**
 - The way a user inputs, queries, or communicates with a LLM AI

What is a Large Language Model?

- **Large Language Models (LLM)**

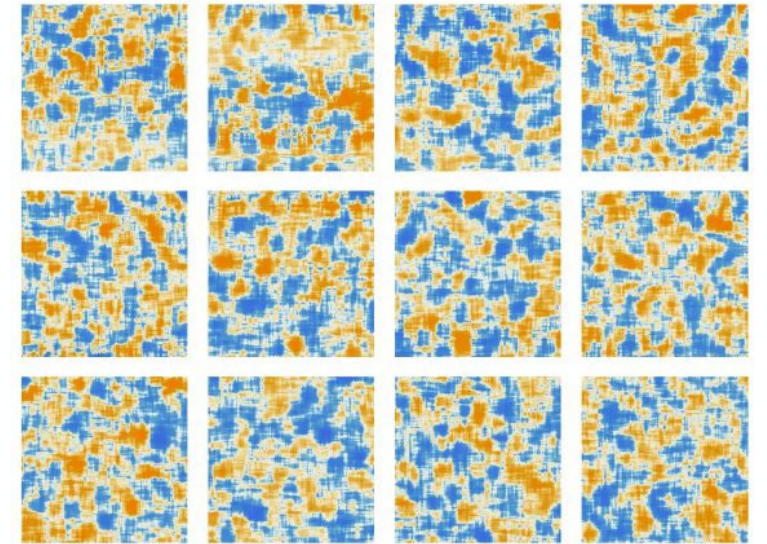
- Artificial intelligence algorithms based on neural networks designed to understand, generate, and manipulate human-like language.
- Trained on vast amounts of data.
- Complexity and capabilities of an LLM is directly related to size.
 - Number of “weights” (training parameters)
 - Amount of training data
- Found to be indistinguishable from humans in many studies



What is a Large Language Model?

The best thing about AI is its ability to

learn	4.5%
predict	3.5%
make	3.2%
understand	3.1%
do	2.9%



Wolfram, S. (2023) "What Is ChatGPT Doing...and Why Does It Work?", Book, Available at <https://writings.stephenwolfram.com/2023/02/what-is-chatgpt-doing-and-why-does-it-work/>

How Can We Use LLM AI?

- Scribe/Documentation Tool
- Clinical Decision Support/Search



Medical Scribe

- Generative AI has the ability to both produce and analyze text through **natural language processing (NLP)**.
- Trainable to your note writing style.
 - With file upload can reference prior medical records/notes.
 - With memory, can be "backward" trained.
- Capable of "scaling" based on role setting and user requirements
- When paired with an AI transcription tool, an LLM can become a fully autonomous medical scribe.

maleDate: [Insert Date]



Subjective:

Chief Complaint:Dyspepsia

History of Present Illness:Complains of a 6-month history of recurrent dyspepsia; sensation of upper abdominal fullness post meals, occasionally with burning sensation. Symptoms are exacerbated by heavy meals. Denies associated nausea, vomiting, weight loss, appetite changes, or altered bowel habits. OTC antacids provide no relief.

Past Medical History:Hypertension on amlodipine.

Message



Examples for Medical Scribe

Nabla Copilot

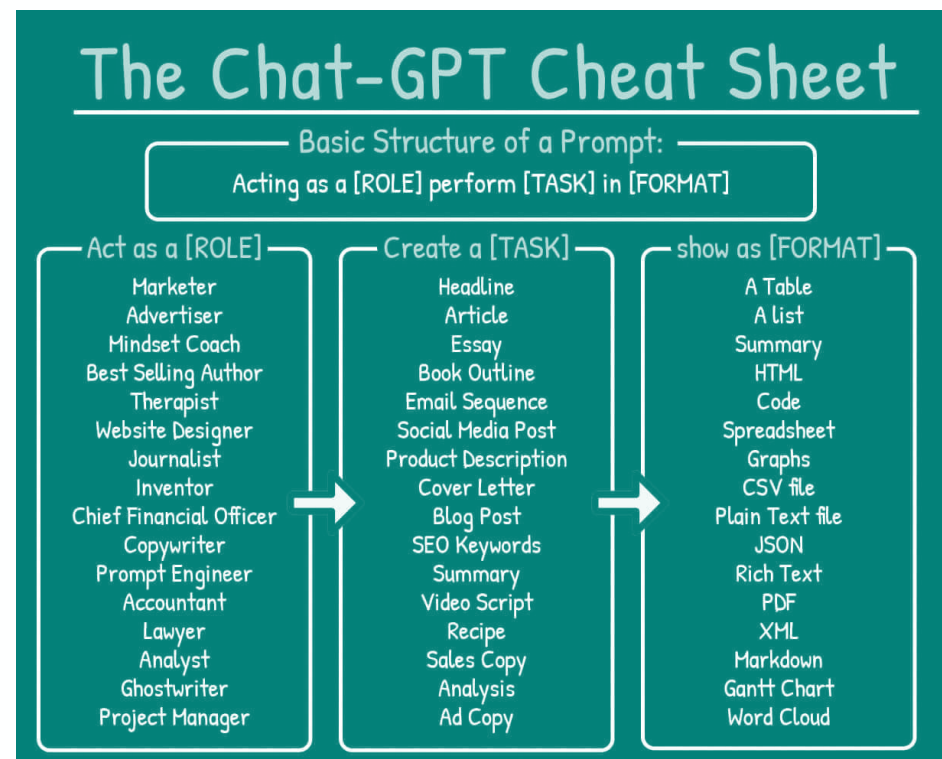


Epic



Understanding Prompts

- “Prompts” are the command entries that make an LLM work.
- “Prompt Engineering” is an art that is rapidly becoming a science.
- Poor prompting = poor result



Understanding Prompts

ChatGPT Prompt Frameworks

Unlock the full potential of ChatGPT

R-T-F

Prompt Example

Facebook Ad Marketer.

Design a compelling Facebook ad campaign to promote a new line of fitness apparel for a sports brand.

Create a storyboard outlining the sequence of ad creatives, including ad copy, visuals, and targeting strategy.

Act as a
[ROLE]

Create a
[TASK]

Show as
[FORMAT]

→ ROLE

→ TASK

→ FORMAT

T-A-G

Prompt Example

The task is to evaluate the performance of team members

Act as a Direct manager and assess the strengths and weaknesses of team members.

Goal is to improve team performance so that the average user satisfaction score moves from 6 to 7.5 in the next quarter.

Define
[TASK]

State the
[ACTION]

Clarify the
[GOAL]

→ TASK

→ ACTION

→ GOAL

B-A-B

Prompt Example

We're nowhere to be seen on SEO rankings

We want to be in top 10 SEO ranking in our niche in 90 days.

Develop a detailed plan for mentioning all the measures we should take also include list of top 20 keywords.

Explain Problem
[BEFORE]

State Outcome
[AFTER]

Ask to the
[BRIDGE]

→ BEFORE

→ AFTER

→ BRIDGE

C-A-R-E

Prompt Example

We are launching a new line of sustainable clothing

Can you assist us in creating a targeted advertising campaign that emphasizes our environmental commitment?

Our desired outcome is to drive product awareness and sales

A good example of a similar successful initiative is Patagonia's

"Don't Buy This Jacket" campaign, which highlighted their commitment to sustainability while enhancing their brand image.

Give the
[CONTEXT]

Describe
[ACTION]

Clarify the
[RESULT]

Give the
[EXAMPLE]

→ CONTEXT

→ ACTION

→ RESULT

→ EXAMPLE

R-I-S-E

Prompt Example

Imagine you are a content strategist.

I've gathered detailed information about our target audience, including their interests & common questions related to our industry.

Provide a Step by Step content strategy plan identifying key topics based on our audience insights, creating an editorial calendar, and drafting engaging content that aligns with our brand message.

Aim is to increase our blog's monthly visitors by 40% and Enhance our brand's position as a thought leader in our industry.

Specify the
[ROLE]

Describe
[INPUT]

Ask for
[STEPS]

Describe the
[EXPECTATION]

→ ROLE

→ INPUT

→ STEPS

→ EXPECTATION

Role Setting

Motivation/Role Setting:

“Pretend you are a ...”

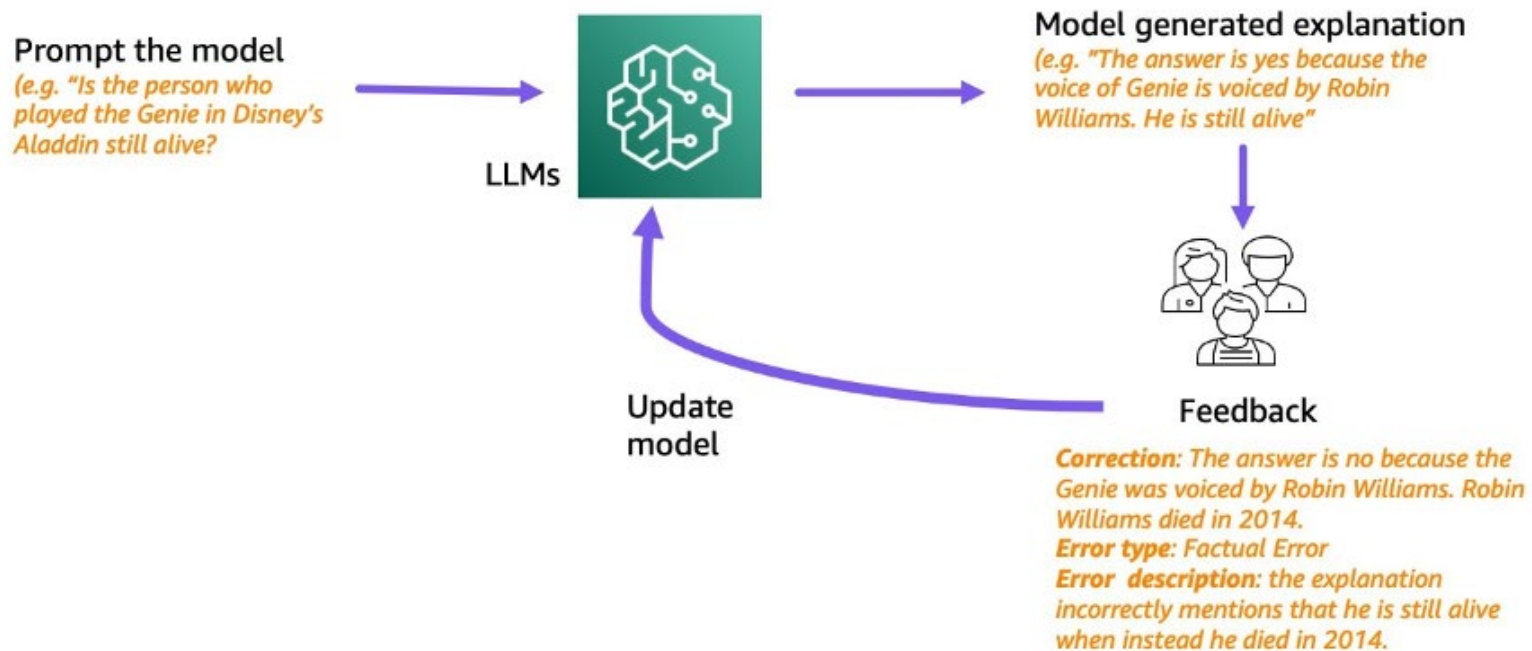
CHATGPT TONE MODIFIERS

Tone Combo	Impact on Output	Use Case	Example
Friendly + Professional	Warm and approachable, yet knowledgeable and competent	Sales emails, customer service, marketing copy	Hi there! We're excited to help you with your purchase. Our team of experts is here to ensure you have a seamless experience from start to finish.
Authoritative + Informative	Confident and knowledgeable, yet informative and helpful	Thought leadership articles, industry reports	As leaders in the field, we have conducted extensive research and analysis to provide you with the most up-to-date insights on the latest trends and best practices in the industry.
Urgent + Persuasive	High sense of urgency and importance, yet persuasive and convincing	Limited time offers, promotional campaigns	Act fast and don't miss out on this exclusive deal! Our premium products are in high demand and we don't want you to miss your chance to own them.
Casual + Conversational	Relaxed and friendly, yet conversational and engaging	Social media posts, blog content, internal communications	Hey there! We wanted to share some exciting news with you. Our team has been hard at work on a new product that we know you're going to love.

Professional + Trustworthy	Reliable and dependable, yet professional and polished	Business proposals, executive summaries, investor pitches	Our team has a proven track record of delivering exceptional results for our clients. With our extensive expertise and commitment to excellence, you can trust us to deliver on our promises.
Humorous + Informal	Entertaining and playful, yet relaxed and conversational	Social media, blog content, internal communications	Our office dog is our official mascot and brings joy to our team every day. Follow our social media to see more of his antics!
Professional + Straightforward	Direct and concise, yet professional and polished	Business emails, formal communications, legal documents	We appreciate your interest in our company and would be happy to provide additional information upon request. Please let us know if you have any questions.
Serious + Empathetic	Understanding and caring, yet serious and sincere	Crisis communications, customer service, sensitive topics	We understand the impact that recent events have had on our community, and we want you to know that we are here to support you in any way we can.
Positive + Enthusiastic	Optimistic and enthusiastic, yet positive and upbeat	Sales pitches, customer service, motivational content	Our products are designed to help you achieve your goals and reach new heights of success. We're excited to be on this journey with you!



Memory



Memory

Custom instructions

On >

Memory



ChatGPT will become more helpful as you chat, picking up on details and preferences to tailor its responses to you. [Learn more](#)

To understand what ChatGPT remembers or teach it something new, just chat with it:

- "Remember that I like concise responses."
- "I just got a puppy!"
- "What do you remember about me?"
- "Where did we leave off on my last project?"

Manage

Customize ChatGPT

Custom Instructions ⓘ

What would you like ChatGPT to know about you to provide better responses?

0/1500

How would you like ChatGPT to respond?

0/1500


Enable for new chats

Cancel

Save

Clinical Decision Support

OpenEvidence TL;Dr. API NEW About Blog Ask OpenEvidence Logout

 All

Showing answer for: When can you stop **dual antiplatelet therapy** if a patient is having severe bleeding after **percutaneous coronary intervention**?

In the context of severe bleeding after percutaneous coronary intervention (PCI), the decision to stop dual antiplatelet therapy (DAPT) must be individualized, balancing the risks of stent thrombosis against the risks of ongoing bleeding. The American College of Cardiology/American Heart Association/Society for Cardiovascular Angiography and Interventions (ACC/AHA/SCAI) 2021 Guideline for Coronary Artery Revascularization suggests that a short duration of DAPT after PCI in patients with stable ischemic heart disease is reasonable to reduce the risk of bleeding events.^[1-4] For patients at high bleeding risk, transitioning to P2Y12 inhibitor monotherapy and stopping aspirin after 1 to 3 months of DAPT may be considered.

The American College of Chest Physicians (ACCP) also provides guidance on perioperative management of antithrombotic therapy, suggesting that in patients with coronary stents placed within the last 6 to 12 weeks who are undergoing elective surgery, either continuation of both antiplatelet agents or stopping one antiplatelet agent within 7 to 10 days of surgery may be considered, depending on the bleeding risk associated with the surgery and the risk for acute coronary syndrome or coronary stent thrombosis if antiplatelet therapy is interrupted.^[5-6]

References

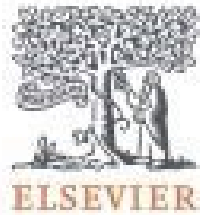
1. [2021 ACC/AHA/SCAI Guideline for Coronary Artery Revascularization: Executive Summary: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines.](#) Show Details
Lawton JS, Tamis-Holland JE, Bangalore S, et al.
Circulation. 2022;145(3):e4-e17. doi:10.1161/CIR.0000000000001039.
★ Top Journal
2. [2021 ACC/AHA/SCAI Guideline for Coronary Artery Revascularization: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines.](#) Show Details
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Circulation. 2022;145(3):e18-e114. doi:10.1161/CIR.0000000000001038.
★ Top Journal
3. [2021 ACC/AHA/SCAI Guideline for Coronary Artery Revascularization: Executive Summary: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines.](#) Show Details
Lawton JS, Tamis-Holland JE, Bangalore S, et al.
Journal of the American College of Cardiology. 2022;79(2):197-215. doi:10.1016/j.jacc.2021.09.005.
★ Top Journal
4. [2021 ACC/AHA/SCAI Guideline for Coronary Artery Revascularization: A Report of the American College of Cardiology/American Heart Association Joint Committee on Clinical Practice Guidelines.](#) Show Details
Lawton JS, Tamis-Holland JE, Bangalore S, et al.
Journal of the American College of Cardiology. 2022;79(2):e21-e129. doi:10.1016/j.jacc.2021.09.006.
★ Top Journal

Clinical Decision Support

recoverx



glass.ai



ClinicalKey®

OpenEvidence™

Practical AI Precautions

- Trust but **verify**.
- Edit/co-sign **every** generated document.
- Communicate with patients. **Seek consent** whenever possible.
- Incorporate/keep records of original transcripts

Use Case: Wearable Devices



Wearable Devices

- 440 million health-focused wearable devices shipped in 2024 with a consumer lead market size of \$82B
- Expected to reduce healthcare costs by up to 16% by 2027, savings >\$200 Bn by 2037 through benefits of remote monitoring
- Variety of applications including:
 - Chronic disease management
 - Remote monitoring
 - Hospital-at-home
 - Personalized and preventative healthcare
 - Longevity and Healthspan
- Further advancements in AI, bluetooth/smartphone and 5G/network technology allow for rapid data transfer and less human monitoring.

<https://www.healthtechdigital.com/what-is-the-future-of-wearable-technology-in-healthcare/>
<https://www.cognitivemarketresearch.com/consumer-smart-wearables-market-report>

CPT Codes

CPT Codes:

Code	Description	Fac Fee	Non-Fac Fee
99453	Initial patient set up and education on use of equipment, can be done remotely by practice staff. (Bill only once per patient, per provider, per 30-days, and only when at least 16 days of data have been collected on at least one medical device. For CGM, use codes 95250, 95249, and 95251.)	NA	19.19
99454	Delivery of results/reports by practice staff to the physician caring for the patient; can be billed once every 30 days. (Bill only once per patient, per provider, per 30-days, and only when at least 16 days of data have been collected on at least one medical device. For CGM, use codes 95250, 95249, and 95251.)	69.00	63.16
99457	First 20 minutes of physician's interpretation and interactive communication with the patient/care giver every month. "Interactive communication" involves, at a minimum, a real-time synchronous, two-way audio interaction that is capable of being enhanced with video or other kinds of data transmission. (The 20 minutes includes both synchronous, real-time interactions as well as non-face-to-face care management services.)	31.75	50.94
99458	Subsequent 20 minutes of physician's interpretation and interactive communication with the patient/caregiver every month. (The 20 minutes includes both synchronous, real-time interactions as well as non-face-to-face care management services.)	31.75	41.17

<https://www.acponline.org/practice-resources/business-resources/telehealth-guidance-and-resources/remote-patient-monitoring-billing-coding-and-regulations-information>

CPT Codes

99473	Specific to self-measured blood pressure monitoring (SMBP), use this code for patient education/training and device calibration. This code can only be submitted once per device.	NA	11.52
99474	Specific to SMBP monitoring, submit this code once a month for ongoing treatment decisions based on the average of the patient's SMBP readings. This code can be used when patients and/or caregivers report their BP readings back to the practice—whether it is done electronically or in person with a SMBP recording log—which then allow the physician to make ongoing treatment decisions. If 99474 services are provided on the same day the patient presents for an evaluation and management (E/M) service to the same provider, these services should be considered part of the E/M service and not reported separately.	8.72	15.00
99091	Collection and interpretation of physiologic data (eg, ECG, blood pressure, glucose monitoring) digitally stored and/or transmitted by the patient and/or caregiver to the physician or other qualified health care professional, requiring a minimum of 30 minutes of time, each 30 days. This code does not require interactive communication like 99457 to bill. However, it requires a physician or other QHP to perform these services, and requires 30 minutes of time every 30 days (not every calendar month) to bill. 99457 and 99091 cannot be billed concurrently.	56.88	56.88
95250	Ambulatory CGM interstitial via subcutaneous sensor for a minimum 72 hrs, office provided equipment, sensor placement, hook-up, calibration of monitor, patient training, removal of sensor, and printout of recording. (Do not report more than once a month; do not report in conjunction with 99091, 0446T)	NA	157.37
95249	Ambulatory CGM ... patient provided equipment ... (Do not report more than once for the duration that the patient owns the data receiver; do not report in conjunction with 99091, 0446T)	NA	58.62
95251	Analysis, interpretation, and report (Do not report more than once a month; do not report in conjunction with 99091)	35.59	35.59

<https://www.acponline.org/practice-resources/business-resources/telehealth-guidance-and-resources/remote-patient-monitoring-billing-coding-and-regulations-information>

Wearable Devices



Continuous Glucose Monitors (CGM)

- Already widely used in diabetic management.
 - Demonstrated improved glucose control (Multiple RCTs) in pts with higher A1Cs compared to self monitoring.
 - Additionally, demonstrated reduction in hypoglycemia (<70 mg/dL) in similar population.
- Benefits in non- and pre-diabetics sold as direct to consumer
- Downside: calibration necessary and cost (\$175/mo on Tastermonial, \$99/mo on Stelo by Dexcom, HSA eligible)



<https://diabetesjournals.org/compedia/article/2018/1/3/144618/The-Evidence-Base-for-Continuous-Glucose>

<https://www.bmj.com/content/385/bmj.q859>

<https://www.healthtechdigital.com/what-is-the-future-of-wearable-technology-in-healthcare/>

Portable Cardiac Monitoring

- Apple Watch = accessible and inexpensive for some, effective for arrhythmia detection:
 - Apple Heart Study
 - REACT-AF Trial
- Useful for cardiologists & non-cardiologists
- Downside: low sensitivity, specificity, not useful for ACS



<https://www.jacc.org/doi/10.1016/j.jacep.2022.07.010>

<https://pmc.ncbi.nlm.nih.gov/articles/PMC8099048/>

<https://www.hmpgloballearningnetwork.com/site/eplab/letter-editor/smartwatch-guided-pill-pocket-anticoagulation-atrial-fibrillation-react-af#:~:text=The%20%2437%20million%20REACT%2DAF,algorithm%20designed%20for%20the%20study.>

Ambulatory Blood Pressure Monitoring

- Get the most evidence based, accurate titration of antihypertensive therapy.
 - JAMA, 2013: Home BP tele-monitoring & titration >25% better control at 6 & 12 months
 - PLOS, 2020: Improved BP control post stroke
- Less expensive and easier to initiate than traditional ambulatory blood pressure monitoring.
- Downside: \$\$\$, compliance and technique



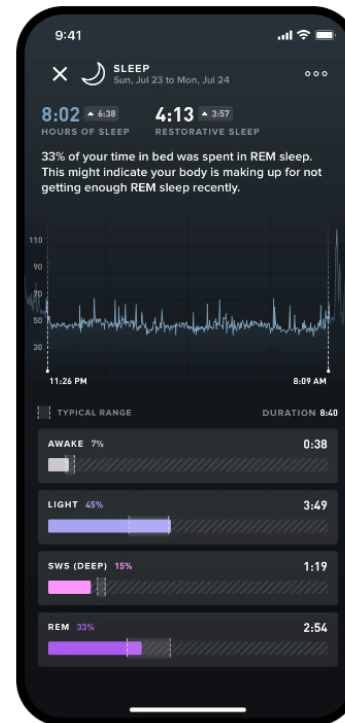
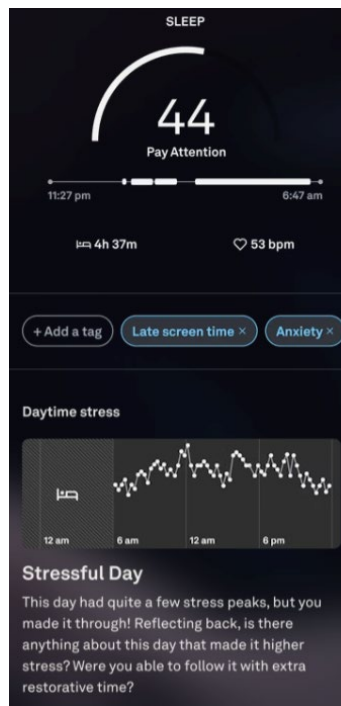
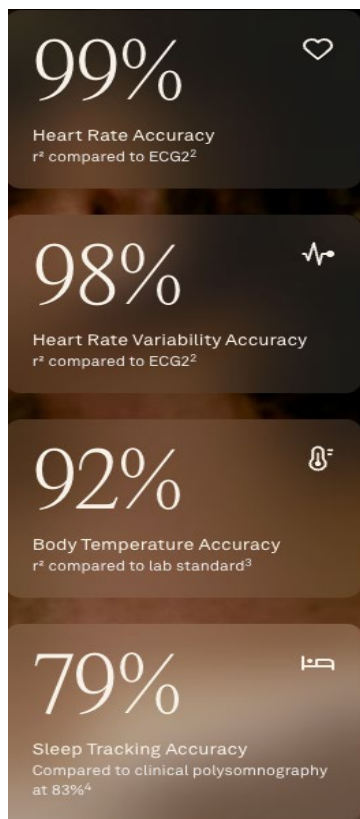
<https://jamanetwork.com/journals/jama/fullarticle/1707720>

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0229483>

<https://www.aafp.org/pubs/fpm/issues/2020/0500/p19.html>

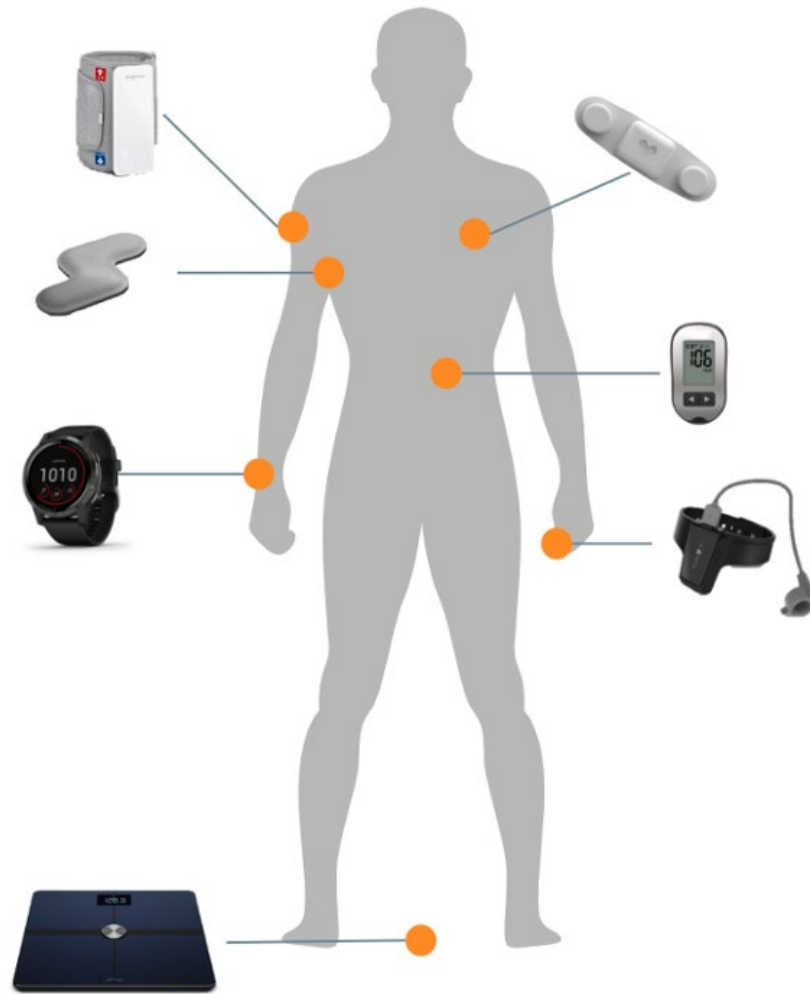
Consumer Holistic Health Monitoring

- Sleep Quality
- Heart Rate Variability
- Strain/Recovery/Stress
- Should osteopathy incorporate remote holistic care?



<https://ouraring.com/why-oura>

<https://www.whoop.com/us/en/the-data/>



VIVALINK

<https://www.vivalink.com/hospital-at-home>



Key Takeaways

- AI tools can increase provider efficiency, allowing for more “hands on”, personalized care in clinic
- Precaution needs to be used when augmenting care with AI tools: the “human-in-the-loop” is still the most trusted source. You still need to be “flying the plane” for the foreseeable future!
- Remote Monitoring offers the chance to provide personalized, convenient care in the home
- With increased touchpoints for data collection and near-continuous monitoring, osteopathic physicians are enabled to promote health, holistic prevention and allow patients to gain their own health insights

Open Discussion:

1. What did you see today that you thought was interesting or that you might consider using in your practice?
2. What other devices do you have questions about that we might not have covered?
3. What are your suggestions for future educational opportunities and live webinars?

The DiME Seal

- Reliability and safety is everything in digital health technology
- The DiME Seal = quality & trust
 - Awarded to products and developers demonstrating highest standards of evidence-based design, protection of privacy, equity, and security.
- Seek DiME Seal when purchasing digital products
- Encourage your organization to sign on to support this effort.
- <https://dimesociety.org/dime-seal/>



Get in touch!

Today's Speakers

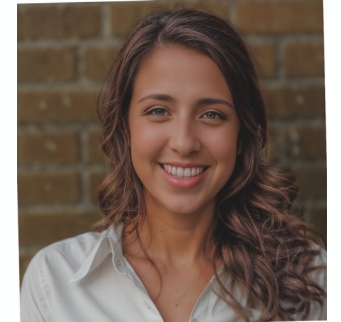


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[Webinar Evaluation](#)

Thank you!

