PANHANDLE HEALTH

A QUARTERLY PUBLICATION OF THE POTTER-RANDALL COUNTY MEDICAL SOCIETY SUMMER 2025 | VOL 35 | NO.3

ARTIFICIAL INTELLIGENCE IN MEDICINE

FEATURING GUEST EDITOR: KISHAN YALAMANCHILI, M.D.

You Take Care of Your Patients,

We'll Take Care of the Banking.

Professional & Executive Private Banking
at the ♥ of the Medical Community

Medical Branch ♥
1700 Coulter Street | Amarillo, Texas 79106
anb.com | (806) 356-5889

Member FDIC | Equal Housing Lender | NMLS# 644528

Amarillo National Bank
Awesome Service

WHEN IT COMES TO BEHAVIORAL HEALTH, WE'RE ALL IN.

Northwest Texas Healthcare System Behavioral Health provides a warm and welcoming environment for addressing a wide variety of mental health conditions. Licensed providers use evidence-based treatments to help decrease symptoms and improve overall quality of life.

Conditions include:

- Anxiety
- Depression
- Personality Disorders
- Grief and Loss
- Postpartum Depression
- Trauma
- PTSD

Services Include:

- Individual Therapy
- Group Therapy
- Support Groups
- EMDR
- VRET
- Biofeedback
- Medication Management

IF YOU OR A LOVED ONE IS STRUGGLING, HELP IS AVAILABLE.
CALL **800-537-2585** OR VISIT **NWTHSBEHAVIORALHEALTH.COM**

Northwest Texas Healthcare System

Behavioral Health
1501 S. Coulter Street
Amarillo, TX 79106

Physicians are independent practitioners who are not employees or agents of Northwest Texas Healthcare System. The hospital shall not be liable for actions or treatments provided by physicians. Model representations of real patients are shown. For language assistance, disability accommodations and the nondiscrimination notice, visit our website. 252923864-2953071 2/25

You Can't Predict a Serious Illness

But You Know It Will Be Expensive

Guaranteed Acceptance for $20,000 of Critical Illness Insurance

As physicians, we know that serious illnesses can strike without warning. Fortunately, there are medical treatments that can help us recover. However, the cost for that care is high. Medical insurance will cover most of these costs, but we know that many of us choose health insurance plans with high deductibles and copays so they are more affordable. Then, we hope we won't get seriously ill and need to cover those and other medical and non-medical costs not covered by our health plan.

TMA Insurance Trust has a more secure solution – the TMA Member Critical Illness Insurance Plan **issued by The Prudential Insurance Company of America.** TMA members under age 65 are **guaranteed to be covered for $20,000 of insurance.** If you are diagnosed as having suffered a heart attack, stroke, cancer or other illnesses, the benefit will be paid directly to you to help cover the high out-of-pocket costs that typically follow a serious illness.

TMA INSURANCE TRUST
LIFE ★ HEALTH ★ INCOME ★ PRACTICE

Take advantage of this guaranteed acceptance offer and help close the gap in your health insurance by enrolling by February 28th. You can scan the QR code to enroll online or contact an advisor for assistance at **800-880-8181**, Monday to Friday, 8:00 AM to 5:00 PM CST. You can also visit us online at **tmait.org**. It will be our pleasure to serve you. ▶

SCAN TO ENROLL

This coverage is not health insurance coverage (often referred to as "major medical coverage").

Group Critical Illness Insurance coverage is a limited benefit policy issued by The Prudential Insurance Company of America, a Prudential Financial company, Newark, NJ. Prudential's Critical Illness Insurance is not a substitute for medical coverage that provides benefits for medical treatment, including hospital, surgical and medical expenses and does not provide reimbursement for such expenses. The Booklet-Certificate contains all details, including any policy exclusions, limitations, and restrictions which may apply. If there is a discrepancy between this document and the Booklet-Certificate/Group Contract issued by The Prudential Insurance Company of America, the Group Contract will govern. A more detailed description of the benefits, limitations, exclusions applicable are contained in the Outline of Coverage provided at time of enrollment. Please contact Prudential for more information. Contract provisions may vary by state. Contract Series: 114774.

1084276-00001-00

PANHANDLE HEALTH

A Publication of the Potter-Randall County Medical Society

SUMMER 2025 | VOL 35 | NO. 3

CONTENTS – Artificial Intelligence in Medicine

PANHANDLE HEALTH is published quarterly by the Potter-Randall County Medical Society, (806) 355-6854. Subscription price is $12.00 per year.

POSTMAN: Send address changes to PANHANDLE HEALTH, 1721 Hagy, Amarillo, Texas 79106. ISSN 2162-7142

PHOTOCOMPOSITION AND PRINTING BY COLORART-AMARILLO.

Executive Director's Message

by Katt Massey, Executive Director

Hello PRCMS Members and Beyond,

My dad once shared with me that he "couldn't believe we could make phone calls from our wristwatch like Dick Tracy." He thought he'd never see the day, and that he thought by now we'd be driving cars like "The Jetsons."

There have been "big moves" in the futuristic realm--but not flying personal vehicles…yet.

I consider myself to be a part of the "Xennial generation (1)," which is 1977-1983, even though 1984 is my birth year. I know a time before cell phones and the internet. One where we played outside from sunup to sundown in the blistering heat and the bitter cold, where we had to go to a friend's house to make a call or draw a picture on a "Big Chief" pad with colored pencils. 1990 was my first true interaction with a computer. Our teacher taught us homebase for our typing fingers, and my classmates and I fought to keep our family alive on "Oregon Trail." I, too, never thought we'd have tiny computers in our pockets or on our wrists. The MAC computer was as mindboggling as it is now, only now it's so much more powerful.

To me, growing up this way, Artificial Intelligence (AI) is both fascinating and terrifying.

Fascinating in that doctors can diagnose and create treatment plans for medical patients using AI. In participating in the planning meetings for this issue, I learned that physicians can chart and prescribe using programs like "Heidi AI," and "Genesis Mobile", among other crazy medical phenomena. (Insert mind-blowing emoji here)

Terrifying in that people's preferences can be used in ways that are damaging or that misrepresent the truth. My phone knows all the things I love and hate. Who knew that we'd be asking Alexa or Siri so many questions that they would know us better than we know ourselves? I didn't, but now my children know no different. "Hey Alexa, play John Prine," were first words to the AI assistant from both of my children. Chat GPT can write better than most pros, but, from what I understand, Dr. Urban gave it a run for its money while paring down his interview with Dr. Yalamanchili, as you'll see towards the back of the issue.

I hope you find these articles as interesting as I have.

On to some quick PRCMS updates. I attended my first TexMed in San Antonio. It was the experience I needed to put the pieces together on how the TMA machine runs. I am grateful that I was able to participate. Walk With A Doc is the third Saturday of the month.

Our fall issue will be "Rural Healthcare."

Katt Massey

SCAN HERE
A quick survey that will help us improve your PHM experience!
Call Katt @ 806-355-6854 with any questions.

(1) The Xennial generation, defined as those born between 1977 and 1983, exhibits several unique characteristics:

Digital Adaptation: Xennials grew- up during the transition from analog to digital, making them adept at using technology while also appreciating pre-digital experiences.

Independence: They are known for their independent and self-reliant mindset, having navigated their formative years without the pervasive influence of social media.

Cultural Awareness: This generation experienced significant cultural shifts, embracing diversity and non-conformity while valuing work-life balance.

Nostalgia for Simplicity: Many Xennials have a fondness for the simpler times of their youth, often reminiscing about life before smartphones and constant connectivity.

These traits highlight the unique position of Xennials as a bridge between Generation X and Millennials.

Our Next Issue Of *Panhandle Health*
Features:
Rural Healthcare

President's Message

by Tetyana Vasylyeva, MD, PhD, FAAP

Artificial intelligence (AI) is a set of technologies that enable computers to perform various advanced functions. Over the last decade, it has found its way into medicine and medical education through collaboration between clinicians and AI developers.

Although AI opens horizons, it's important to note that it also has limitations. Medicine remains a human art at its core, with compassion for patients, and AI should be seen as a tool to enhance, not replace, human expertise.

What could AI bring to medicine, and how could it help? AI is making a huge impact, from diagnostics to personalized treatments, optimizing workflow and supporting diagnostic tools and decision-making ability. AI algorithms, particularly deep learning models, can analyze medical images: X-rays, CT and MRIs, ultrasound, and pathology slides. AI has also revolutionized surgery by improving precision, reducing errors, and enhancing patient outcomes. However, these AI-assisted systems are always under skilled surgeons' control, ensuring patient safety is paramount. Some relevant concerns include, but are not limited to, algorithmic bias, transparency, over-reliance, and the potential impact on the healthcare workforce.

AI performs amazingly in finding new drugs by predicting how different compounds interact with different biological substances. AI has revolutionized drug discovery by making the process faster, cheaper, and more efficient. It can identify molecules that could be potential drugs, predict how these molecules will interact with human proteins, and reduce the need for expensive and time-consuming lab experiments. AI models simulate and predict toxicity risks, potential side effects, and drug interactions.

The most important aspect is the vision for further development of personalized medicine. AI could analyze patient data to recommend treatments tailored to an individual's genetic profile. It can predict disease outbreaks, patient deterioration, and hospital readmission risks.

AI may become a patient's personal assistant, helping them manage medication through apps, schedule appointments, and answer health-related questions. It will transform medical education by making learning more interactive, personalized, and efficient for students, doctors, and healthcare professionals.

Artificial intelligence from fiction books has become our daily reality, and this Panhandle Health journal issue is dedicated to stories about how fairy tales come true. This issue will give you a vivid imagination of the future of medicine. But I also strongly believe that medicine will remain a human art with an AI "brush" in our hands.

Original

AI Generated

Generated with prompts to ChatGPT by Katt Massey.

**Photo generated from a photo of Katt prompted on LTX studio: "Make this woman look like a futuristic funky artist with gray streaked hair."*

About The Artist
on the cover

The cover artwork wasn't born from brushes or cameras, but from curiosity and a keyboard.

The featured image, "Cadussey," a futuristic woman embodying the theme Artificial Intelligence in Medicine, emerged not from a studio, but from a single prompt typed into Canva's AI image generator. The artist—an everyday individual, a trained pen, paper, paint brush creative—typed seven words and witnessed something extraordinary materialize: a figure that blurs the lines between human and machine, fiction and reality.

"Cadussey" represents a new frontier where artistry is no longer gated by traditional skills, but expanded by technology. As AI begins to generate images that rival—and sometimes surpass—the realism of photography, it forces the viewer to ask: Can the average eye still tell what's real? Perhaps more importantly: Does it matter anymore?

This piece explores the intersection of creativity, ethics, and identity in an age where anyone can be an artist, and anything can be art.

Women's Physicians Luncheon

At the home of Dr. Lisa Veggeberg

Presented by:
Texas Medical Association

POTTER-RANDALL COUNTY MEDICAL SOCIETY **ALLIANCE**

Message from the Potter-Randall County Medical Alliance

by Alena Martin & Madeline Lennard, Co-Presidents

Wow, is all we can say about the Spring Wine Dinner! 95 guests enjoyed a delicious meal, delectable wine, and great conversation. The Spring Wine Dinner will be highlighted in AccentWest, so be sure to grab a copy. Amarillo Club was an excellent host and graciously donated 10% of any wine purchases made at the dinner! We are so humbled and proud to announce that over $25,000 was raised as a result of this fundraising effort! Thank you, thank you! We cannot wait to contribute to our scholarship funds, keep books stocked at Heal the City, and provide helmets to kids at North Side Toy Drive in December.

As many of you know, TMA hosted its annual conference, TEXMED, in San Antonio in early May. The Alliance hosts a conference during the same event called ALLMED. Alena Martin was able to attend the ALLMED round table discussions and celebration luncheon. It was a great time of networking and brainstorming with other Alliances around the state. PRCMA applied for TMAA's Blue Ribbon Awards, and we were proud to receive several medals including: a bronze medal for members using auto-renewal and a gold medal each for overall membership increase and first-time member increase. We have been so pleased with how the medical community has received the Alliance in the past year and are so grateful for our membership.

Reviving our membership was the goal for 2024, and we definitely succeeded as we won the TMAA Blue Ribbon Durham Membership Award! Below is how TMAA summarized our activities and highlighted our Alliance:

"What began as a mailing to reintroduce the Alliance to Potter-Randall County Medical Society and Alliance members and invite them to a few events ignited an undertaking that has brought the previously declining Alliance back to life. From building bridges with medical students and resident physician families, to hosting family and couples' events, to welcoming members at a Connect Over Coffee gathering, the alliance has welcomed new members and seen lapsed members return. In addition, a collaboration with the county medical society to place billboards on major thoroughfares honored local physicians on Doctor's Day.

For the past two years, the Potter-Randall Alliance has seen positive membership growth, this year leading all alliances with 51% overall membership increase and a 32% increase in new members. In addition to the growth, the alliance reports increased member engagement. This commitment by a small cadre of members to rebuild the alliance over the past couple years reconfirms the power of dedicated action to yield big results."

Be on the look-out for this year's Check-Up newsletter, generously sponsored by Amarillo National Bank. It will highlight our scholarship recipients, as well as provide a calendar of events for the upcoming year. Events to look forward to include: pop-up wine nights, an American Mah Jongg lesson, family potluck, couples social and, of course, the Wine Dinner fundraiser at Amarillo Club.

Guest Editorial
The Age of AI in Medicine Has Arrived

by Kishan Yalamanchili, MD

It wasn't long ago that artificial intelligence (AI) felt like science fiction—a concept best reserved for futuristic thrillers, tech expos, and Silicon Valley startups. I first became interested in AI about 35 years ago, as a ten-year-old fascinated by the idea that machines might one day think like humans. Back then, even many of the experts in the field thought true breakthroughs were far off—or perhaps impossible. The field was mired in what's now referred to as an "AI winter," a time when enthusiasm and funding dried up due to limited progress and unmet promises. Yet even as a child, I found the idea irresistible: a machine that could reason, learn, adapt, and perhaps even one day assist in the most human of endeavors—healing.

Fast forward to today: the future has arrived—not with a bang, but with a thousand small changes that have quietly transformed how we practice medicine. We use AI when we dictate our notes. We use it when radiology flags a suspicious nodule before we even look at the scan. We use it when a predictive model in the ICU warns us that our stable-looking patient might crash in the next 12 hours.

The question is no longer if AI will reshape healthcare. It's already doing so. The real questions are: *How? Where? And what next?*

This issue of Panhandle Health is dedicated to exploring those very questions. In it, you'll find a multidisciplinary, and sometimes multidimensional, look at AI in modern healthcare. Across subspecialties, practice settings, and philosophical perspectives, our contributors dig into the promise, the peril, and the path forward.

Before we go further, a few definitions may help. Artificial intelligence, in the broadest sense, refers to computer systems that can perform tasks typically requiring human intelligence. These tasks include reasoning, learning from experience, interpreting complex data, and even generating new content. Within AI are many subfields:

• **Machine learning (ML)** is a method by which algorithms improve their performance by being exposed to more data, rather than by being explicitly programmed.

• **Natural language processing (NLP)** allows computers to understand and generate human language.

• **Computer vision** enables machines to interpret and analyze visual information in X-rays or MRIs.

• **Neural networks**, inspired by the human brain, are layered frameworks that can identify patterns in data, often used in deep learning models.

But even those definitions barely scratch the surface of what's coming next. As we begin to see more capable systems emerge, some thinkers in the field are beginning to speak openly about the possibility of Artificial General Intelligence (AGI)—a machine with the ability to understand, learn, and apply knowledge across a wide range of tasks, just like a human being. AGI remains speculative, but it raises fascinating—and sometimes unsettling—questions about the future of labor, identity, and even consciousness.

Alongside AGI lies the idea of the **technological singularity**: a hypothetical future point where AI systems improve themselves so rapidly that they create runaway, exponential change in human society. To some, this sounds like dystopian science fiction. To others, it's a warning to ensure that we're designing systems that remain beneficial and aligned with human values.

Which brings us to one of the most important concepts in contemporary AI discussion: **AI alignment**. This refers to the effort to ensure that AI systems—especially powerful ones—act in ways that are consistent with human ethics, intentions, and societal well-being. In health-

care, this matters deeply. If an AI model can identify tumors or predict sepsis, it must do so equitably across populations, without introducing bias, and in ways that clinicians can understand and validate.

Dr. Brad Hoyt dives into one of the most immediate applications of AI: medical documentation. Anyone who has practiced medicine in the electronic health record (EHR) era knows the burden that documentation places on our time, energy, and morale. AI-assisted charting and ambient listening tools now promise to reduce this burden—not just by transcribing our words, but by understanding the clinical context and turning conversations into structured, billable documentation. That may sound like magic. It's not. It's happening now. The early adopters are already saving hours per week and seeing measurable reductions in burnout.

From there, we move to the reading room, where Dr. April Bailey examines the impact of AI on radiology. This specialty has been on the leading edge of AI integration, with tools that can identify abnormalities, prioritize high-risk studies, and even compare findings to vast databases of prior imaging. Some fear these tools will replace radiologists. More accurately, they are changing the role of the radiologist—freeing up time for nuanced interpretation, multidisciplinary consultation, and patient communication. The radiologist of the near future may look more like a diagnostic strategist than a solitary image reader.

In the high-stakes environment of the ICU, Dr. Kishore Yalamanchili explores how AI can serve as an early warning system and clinical decision support tool. Here, the margin for error is razor-thin. AI can process continuous streams of vital signs, lab values, and clinical notes to identify deterioration patterns that the human mind might miss. But reliance on algorithms comes with new risks: false positives, opaque decision-making, and the potential to de-skill clinicians. Dr. Yalamanchili strikes a thoughtful balance between enthusiasm and skepticism, offering real-world examples from the bedside.

AI is also making its presence known in oncology, where it is revolutionizing everything from drug development to individualized treatment planning. In psychiatry, AI is being used to detect mood disorders through speech patterns, facial expressions, and even social media activity. These applications raise urgent ethical questions. Who owns the data? What happens when an algorithm gets it wrong? And can a machine ever truly understand the human mind?

Pharmacy, too, is undergoing transformation. We explore the basic science of AI in pharmacology as well as a frontline perspective on how AI is influencing pharmacy practice and workflow. The implications extend beyond the hospital. AI is helping researchers identify new compounds, predict drug interactions, and optimize dosage regimens based on real-time patient data.

Beyond clinical applications, this issue also addresses the structural and societal implications of AI. Alisa Pierce brings us a policy perspective from the Texas Medical Association. We will need proactive engagement by medical societies, emphasizing the need for clear guidelines, transparent algorithms, and ongoing education. AI must serve as an adjunct to clinical judgment, not a replacement. What practical steps can we take today to ensure AI aligns with the values of patient-centered care?

Rounding out the issue is Dr. Poage's exploration of AI in the emergency department. The fast-paced, unpredictable nature of emergency medicine presents unique challenges for AI integration, but also enormous potential. Imagine triage algorithms that identify the sickest patients before they even arrive, or tools that predict which patients are at high risk of admission, bounce-back, or adverse events. These technologies could dramatically improve throughput, reduce crowding, and enhance care—but only if they are implemented wisely and monitored closely.

As guest editor, I am both inspired and humbled by the breadth of insight represented in this issue. Our contributors are not just reporting on AI; they are living it, testing it, questioning it. They remind us that we are in a transitional moment. We are building the plane while flying it. And that means we must bring intention, humility, and vigilance to the work ahead.

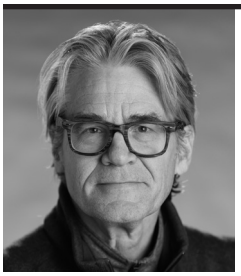
AI won't replace doctors. But doctors who use AI wisely, ethically, and creatively may well replace those who don't. This is not a threat. It's a call to engagement. AI will not absolve us of our responsibilities. It will amplify them. It will force us to ask harder questions, to explain our decisions more clearly, and to confront our own cognitive biases with honesty.

It will also, if we do this right, free us from some of the soul-crushing inefficiencies that have driven too many talented clinicians to the brink of burnout. It might give us back the most precious resource in modern healthcare: time. Time to think. Time to connect. Time to care.

We are still early in this journey. The tools are imperfect. The risks are real. But so is the potential. Let's approach this next chapter of medicine not with fear, but with curiosity. Not with resignation, but with resolve. The future of healthcare is not being written by machines. It is being written by us.

Let's make sure we get it right.

Dr. Kishan Yalamanchili is the Medical Director of the BSA Hospitalist Group in Amarillo. Board certified in Internal Medicine, with 15 years of hospitalist experience, he oversees both clinical operations and administrative strategy for a busy community hospital. He has a growing interest in the practical applications of artificial intelligence in medicine, particularly in documentation, decision support, and hospital throughput. He serves as guest editor for this issue of Panhandle Health Magazine on AI and healthcare.



Rewriting the Note: Ambient AI in a Multisite Ambulatory Pilot

by Brad Hoyt, MD
Chief Medical Information Officer, Ardent Health

Clinicians across the country know what it feels like to finish seeing patients, only to face hours of documentation late into the evening. At Ardent Health, we heard this concern from every specialty and care setting. Physicians and advanced practice providers reported exhaustion, dissatisfaction, and, in some cases, serious consideration of early retirement. Documentation wasn't just a nuisance. It had become a force pulling clinicians away from medicine.

In late 2024, we piloted an ambient artificial intelligence (AI) documentation solution in collaboration with a technology partner, Ambience Healthcare. Over a 12-week period, we deployed the tool across outpatient settings in four states. By the end of the pilot, 88 clinicians across 17 specialties had collectively documented over 42,000 patient visits using the system.

This article offers a clinical summary of what we learned, from implementation to impact, on physician workload, patient experience, and downstream value. In short, the ambient technology is transformative, and helps Ardent Health retain its clinician workforce in a difficult marketplace.

PILOT DESIGN

Our outpatient pilot included primary care and a broad range of specialty services. Clinicians opted in, and training was brief, with almost no learning curve. The technology itself is passive: it records the conversation in real time, processes it securely, and generates a structured clinical note that appears directly in our Epic electronic health record.

Average weekly usage quickly reached 4,500 encounters. The tool was used in more than 80% of eligible visits and maintained that rate consistently through the pilot period. In the broader market, the average utilization rate for AI scribes is about half of that.

WORKFLOW INTEGRATION

One strength of the pilot was the rapid Epic integration. Within weeks of initial testing, clinicians could view their appointment schedule directly in the app, and the tool was writing notes and diagnoses directly into Epic. This frictionless integration proved crucial to adoption, especially among busy specialists.

Across sites, the average clinician completed nearly 500 patient encounters using the tool. We anticipated a positive response in primary care. What surprised us was the rapid and enthusiastic adoption across diverse specialties including Urgent Care, Orthopaedics, Rheumatology, Gastroenterology, ENT, Podiatry, and Pulmonology. Some specialists even adapted their workflows to use the tool on their hospital rounds. With so much success in the ambulatory settings, we are now piloting the technology in the inpatient and emergency care settings.

IMPACT ON DOCUMENTATION BURDEN

We measured documentation time using data directly from the EMR using Epic User Activity Log data. The average clinician experienced a 43% decrease in documentation time per eight hours of scheduled appointments. In some specialties, the decrease exceeded 50%.

Subjective survey responses reinforced this finding. Seventy percent of pilot participants reported a reduction in cognitive burden. Several clinicians described a feeling of "clarity" or "mental space" during their day. One family medicine physician noted that they no longer spent their lunch hour or evenings catching up on charts and could instead focus on reviewing results, managing patient messages, or simply finishing on time.

CLINICAL SATISFACTION AND RETENTION

A Bain & Company survey found that 25% of clinicians have considered switching careers because of burnout (1).

Which is why, out of all the pilot findings, the most poignant was the number of clinicians who reported rethinking their future in practice. Several stated that they had been considering leaving clinical medicine, but were now delaying or abandoning those plans.

One internal survey comment read simply: "I was actively looking for another way to make a living. Now I can see myself doing this for another 10 years."

A pediatrician described having "significantly fewer days where I felt like retiring early." Others mentioned feeling re-energized or more present with patients. These reports echoed a growing sentiment: the burden of documentation was pushing people out of practice. Reducing that burden may help keep them in, and could be a powerful recruiting tool. In the markets we serve, with 40% of our physicians over the age of 55, this is critical, and fulfills our organization's primary goal for this initiative.

PATIENT EXPERIENCE

A 2016 study in the Annals of Internal Medicine found that, for every hour of direct clinical face time with patients, physicians spent nearly two additional hours in the EHR (2). According to the same study, during the workday itself (not counting after-hours tasks), physicians spent only about 27% of their time in direct patient interaction.

With clinicians spending so much in the EHR, we knew that the patient experience was suboptimal – which is why we were excited to see improvements in patient-reported experience during the pilot.

Press Ganey scores increased in all nine measured categories pertaining to the program, and Epic-generated reporting suggested that clinicians spent 11% more time engaging with patients, instead of typing during encounters. Some providers attributed this directly to the technology, stating that they were no longer dividing attention between the patient and the keyboard.

In a follow-up interview, one clinician described being able to recall patient concerns more clearly, because she had spent more time listening and less time typing. Another said that patients appreciated being heard without the distraction of note-taking.

One cardiologist expressed his satisfaction in a clinician survey: "Since using Ambience, I no longer bring a piece of scrap paper into the room for note taking. I simply listen - occasionally repeating important facts - and keep eye contact with the patient."

We were pleasantly surprised to see an uplift in patient experience scores. We didn't expect that the positive impact on clinicians would have made such an immediate and recognizable difference on patient care.

CLINICAL QUALITY AND VALUE

This wasn't just a new cost center to invest in our workforce. Aside from the soft benefits, we achieved a measurable, positive return on investment via direct financial benefit.

We tracked changes in documentation quality, coding accuracy, and revenue impact. Without asking clinicians to see more patients, we observed a measurable improvement in the complexity and accuracy of coding. Results were validated by our revenue cycle leaders.

Documentation improvements drove a meaningful increase in Hierarchical Condition Category (HCC) capture and improved Evaluation and Management (E/M) coding. At scale, this will generate tens of millions for our bottom line. Our caregivers are already providing world-class patient care. This technology just helps them get credit for it.

These financial outcomes were not the focus of the pilot, but they underscored the clinical completeness of the documentation generated. Most notes included detailed histories, multiple diagnoses, and thorough patient instructions—without requiring additional dictation or template use.

CONCLUSION

The practice of medicine relies on clear communication, thoughtful documentation, patient trust, and time to think. When any one of these is compromised, the quality of care and clinician well-being suffer.

Ambient AI documentation is not a cure-all. But, in our pilot, it demonstrated a meaningful reduction in documentation burden, improved the patient experience, and provided a financial return—without asking clinicians to work harder. Just differently. As a result, I now see ambient AI as a key technology pivotal to our recruitment and retention of clinicians.

As more systems adopt ambient tools, we will need continued evaluation of their clinical, operational, and human impact. But, for now, one thing is clear: documentation no longer has to come at the cost of doing the work we signed up for.

REFERENCES

1. https://www.bain.com/insights/a-treatment-for-americas-healthcare-worker-burnout/
2. Sinsky C, Colligan L, Li l, et al. Allocation of physician time in ambulatory practice: a time and motion study in 4 specialties. Ann Int Med. 2016 Dec 6;165(11):753-760. PMID: 27595430/

Brad Hoyt, MD, serves as chief medical information officer (CMIO) at Ardent Health, where he leads enterprise-wide initiatives to enhance clinical information systems and optimize electronic health records (EHR) across 30 hospitals and nearly 280 care sites. A seasoned physician with nearly three decades of clinical experience, Dr. Hoyt plays a pivotal role in integrating technology and data-driven strategies to improve care delivery and clinical outcomes.

Prior to his current role, Dr. Hoyt spent 26 years practicing internal medicine at Ardent's Utica Park Clinic and Hillcrest HealthCare System in Tulsa, Oklahoma. His leadership experience includes serving as chief of internal medicine at Utica Park Clinic, acute care service line chief at Hillcrest Medical Center, and a founding member of the Ardent Physician Advisory Council.

Dr. Hoyt is a graduate of Rice University and earned his medical degree at Baylor College of Medicine, where he also completed his residency.

AI in the ICU: Practical Applications of Artificial Intelligence in Critical Care

by Kishore Yalamanchili, MD

Artificial Intelligence (AI) is no longer an abstract promise. It is already reshaping the intensive care unit (ICU), one of medicine's most data-rich and decision-intensive environments. From ventilator management and early sepsis detection to clinical documentation and diagnostic support, AI is becoming a quiet but powerful partner in how care is delivered. It doesn't present on morning rounds or sign out at the end of a shift, but it is increasingly influencing what gets flagged, documented, escalated, and sometimes even decided.

This article explores the practical, real-world applications of AI in the ICU today. These are technologies that are functional, scalable, and in many cases already reducing the need for human micromanagement. It also introduces emerging technologies such as generative and multimodal AI and highlights the ethical and regulatory considerations that must guide their use.

EARLY DETECTION AND DIAGNOSTIC SUPPORT

Traditional ICU scoring systems, like SOFA (Sequential Organ Failure Assessment) or qSOFA, are blunt tools. They're limited by static variables and often miss deterioration until it's well underway. AI-based systems, however, can analyze streaming vital signs, lab results, nursing documentation, and even waveform data to spot trouble hours before it becomes visible to the clinical eye.

One example is the Targeted Real-time Early Warning Score (TREWS), a machine learning model that predicts the risk of septic shock. In deployment across several hospitals, clinicians who responded to a TREWS alert within three hours saw significantly reduced in-hospital mortality (1). These tools can flag subtle signals, like rising respiratory rate, worsening lactate trends, or creeping creatinine, well before clinical suspicion arises.

Similarly, diagnostic support is evolving. Deep learning algorithms trained on chest X-rays can now detect pneumothorax, misplaced endotracheal tubes, pulmonary edema, or pneumonia at levels that rival experienced radiologists. Some health systems have already integrated these models into radiology workflows, enabling real-time triage and escalation. At the bedside, point-of-care ultrasound interpretation is also being supported by AI, which can guide probe placement, label anatomy, and highlight abnormal structures. This provides decision support even for non-experts.

Beyond imaging, AI models can synthesize lab results, vital signs, and prior notes to surface differential diagnoses that might be missed. In rural ICUs or community hospitals without immediate specialty support, these systems function as diagnostic extenders, offering clinical insight where resources are thin.

VENTILATOR MANAGEMENT

Mechanical ventilation is a technically challenging aspect of critical care. Small adjustments in settings, such as tidal volume, PEEP, or FiO_2, can significantly affect outcomes. Traditionally, optimal management has relied on experience, real-time judgment, and pattern recognition honed over years. AI is starting to fill in that gap.

Some systems now analyze ventilator waveform data continuously, detecting signs of asynchrony, overdistension, or patient-ventilator mismatch (2). Others recommend adjustments in PEEP based on lung compliance and oxygenation trends. These algorithms aren't just theoretical. Several are embedded into closed-loop ventilation systems that auto-adjust in real time to minimize lung injury and reduce the need for constant bedside recalibration (2).

Perhaps more impactful, though, are AI tools that identify when a patient is ready to come off the ventilator. Models trained on thousands of extubation cases can now assess readiness based on respiratory rate, tidal volume, sedation scores, blood gases, and trends in spontaneous breathing effort (3,4). This provides an added layer of safety before a potentially risky trial of liberation from the ventilator.

As these tools evolve, they promise not only better outcomes but a shift in how respiratory care is delivered. They offer care that is less reliant on individual clinician vigilance and is more standardized, precise, and reproducible.

PROGNOSTIC MODELING AND GOALS OF CARE

AI is especially adept at prediction. In the ICU, that can be a powerful tool for clinical planning and patient-centered care. Machine learning models now outperform legacy scoring systems like APACHE (Acute Physiology and Chronic Health Evaluation) or SOFA in predicting ICU mortality and readmission risk.

Some of the most compelling applications are in palliative care. At several health systems, AI tools flag patients at high risk of death within 30 or 90 days, often within the first 48 hours of admission. Both physicians and

patients frequently underestimate the true mortality associated with serious illnesses. This reflects a broader educational gap regarding end-of-life epidemiology. When these alerts are shared with providers, studies have shown higher rates of timely goals-of-care conversations, earlier palliative consults, and reduced aggressive interventions at the end of life (1).

This is particularly meaningful in the ICU, where high-stakes interventions, such as dialysis, vasopressors, or mechanical ventilation, can prolong suffering in patients who might have preferred a different trajectory if given the choice. AI can't and shouldn't make these decisions, but it can prompt clinicians to ask the right questions at the right time.

Similarly, AI systems have been developed to predict the risk of acute deterioration, such as cardiac arrest or respiratory failure, several hours in advance. These forecasts, if trusted, could enable preemptive intubation, transfer to higher levels of care, or more intensive monitoring. In essence, they extend the ICU team's situational awareness beyond the present and offer a probabilistic glimpse of the near future.

MEDICATION AND INFECTION SAFETY

The ICU is a high-risk zone for medication errors and hospital-acquired infections. Patients are on dozens of medications, often weight-based, with narrow therapeutic windows and serious consequences for mistakes.

AI is helping reduce those risks. Some systems review medication orders in real time, checking for dosage errors, frequency mismatches, and dangerous interactions--not just with current meds, but also with allergy history, renal function, and past side effects. Others use computer vision to scan vials and syringes before administration, ensuring the right drug is being given at the right dose. In testing, these AI-powered safety checks have achieved near-perfect sensitivity in preventing potentially fatal mix-ups (5).

On the infection side, AI can detect subtle signs of bloodstream infections, ventilator-associated pneumonia, or *C. difficile* colitis based on trends in labs, vitals, and nursing documentation. These models can flag cases before they meet CDC definitions, allowing earlier investigation and treatment. They can also optimize antibiotic stewardship by recommending de-escalation or flagging redundant coverage, decisions that would normally require an infectious disease consult.

Together, these tools represent a shift from reactive to proactive safety. They are catching problems before they become crises.

GENERATIVE AND MULTIMODAL AI

The newest frontier in ICU AI lies in generative and multimodal models. Generative AI, like GPT-4 and Med-PaLM, can interpret and generate clinical text. In the ICU, these tools are being explored to draft progress notes, summarize overnight events, translate medical jargon for patients' families, or even help junior clinicians to troubleshoot equipment issues or interpret ABGs. Some hospitals are piloting their use in composing discharge summaries or drafting clinical consultation reports, dramatically reducing the burden of documentation.

Multimodal AI systems take this further by integrating text, images, waveform data, labs, and more into a unified model. These systems don't just analyze isolated signals. They form a holistic "digital twin" of the patient, continuously updated in real time. A spike in heart rate, combined with a subtle ECG change, new fever, and trending leukocytosis might be enough for the model to flag early sepsis before any one clinician puts it all together (1,5).

This level of integration is still early, but the potential is enormous. Such systems could provide bedside teams with comprehensive assessments, likely outcomes, and suggested next steps. All of it is tailored to the specific patient and based on a richer understanding of context than any single source can offer.

ETHICAL AND REGULATORY CONSIDERATIONS

With great power comes great responsibility. AI in critical care is no exception. These tools are only as good as the data they're trained on. If the underlying data reflect bias, inconsistencies, or poor documentation, the AI will replicate and even amplify those problems.

Transparency is another challenge. Many models are "black boxes," offering predictions without explanation. That's unacceptable in high-stakes environments like the ICU, where every decision has consequences. Explainable AI, which shows why a prediction was made, is a critical area of research.

Accountability is also a concern. If an AI recommends an intervention that harms a patient, who is responsible? The clinician? The hospital? The vendor? The answer isn't always clear, and regulatory frameworks are still catching up.

Finally, there's the human element. AI must be implemented in ways that support clinical judgment. Used wisely, it can reduce cognitive load, automate routine tasks, and bring attention to subtle patterns that might otherwise go unnoticed.

Some will insist, "But AI should never overrule the bedside clinician, whose role includes empathy, nuance, and the ability to navigate uncertainty in ways no algorithm can!"

But what if that changes? What if AI, learning from every patient, every mistake, and every clinical decision ever made, begins to make better judgments than we can? What happens when empathy, nuance, and uncertainty are

no longer uniquely human qualities, but capabilities that AI can simulate or even surpass? And if that day comes, what then becomes of the bedside clinician?

CONCLUSION

AI is not a sci-fi fantasy. It's already here, in code that scans your patients' vitals, notes, and images while you sleep. It flags the septic, predicts the crashing, drafts your notes, and checks your orders. It doesn't call for backup, but it's in the room with you.

Used thoughtfully, AI can extend what critical care medicine does best: timely action, precise intervention, and vigilant monitoring. But its success depends on us, on how we implement, monitor, and ethically supervise these tools.

The AI ICU isn't a vision of the future. It's the present. The only question is how we choose to use it.

REFERENCES:

1. Adams R, Henry KE, Sridharan A, et al. Prospective, multi-site study of patient outcomes after implementation of the TREWS machine learning-based early warning system for sepsis. Nat Med. 2022 Jul;28(7):1455-1460. doi: 10.1038/s41591-022-01894-0. Epub 2022 Jul 21. PMID: 35864252.
2. Liu CF, Hung CM, Ko SC, et al. An artificial intelligence system to predict the optimal timing for mechanical ventilation weaning for intensive care unit patients: A two-stage prediction approach. Front Med (Lausanne). 2022 Nov 18;9:935366. doi: 10.3389/fmed.2022.935366. PMID: 36465940; PMCID: PMC9715756.
3. Kennedy JN, Rudd KE. A sepsis early warning system is associated with improved patient outcomes. Cell Rep Med. 2022 Sep 20;3(9):100746. doi: 10.1016/j.xcrm.2022.100746. PMID: 36130478; PMCID: PMC9512693.
4. Jiang X, Peng W, Xu J, et al. Development and validation of machine learning models for predicting extubation failure in patients undergoing cardiac surgery: a retrospective study. Sci Rep. 2025. 15; 8506. https://doi.org/10.1038/s41598-025-93516-1
5. Jiang W, Liu T, Sun B, et al. An artificial intelligence application to predict prolonged dependence on mechanical ventilation among patients with critical orthopaedic trauma: an establishment and validation study. BMC Musculoskelet Disord. 2024 Dec 30;25(1):1089. doi: 10.1186/s12891-024-08245-9. PMID: 39736687; PMCID: PMC11684237.

Kishore Yalamanchili, MD is a pulmonary and critical care physician and associate professor at Texas Tech University Health Science Center in Amarillo, Texas.

PANHANDLE HEALTH

A PUBLICATION OF THE POTTER-RANDALL COUNTY MEDICAL SOCIETY

Editorial Policy and Information for Authors

Purpose: *Panhandle Health* strives to promote the health and welfare of the residents of Amarillo and The Texas Panhandle through the publication of practical informative papers on topics of general interest to most physicians while maintaining editorial integrity and newsworthiness.

Spectrum: The Journal seeks a wide range of review articles and original observations addressing clinical and non-clinical, social and public health, aspects as they relate to the advancement of the state of health in the Texas Panhandle. Pertinent letters to the editor, new submissions, and obituaries are accepted pending editorial review. The Editorial Board accepts or rejects submissions based on merit, appropriateness, and space availability.

Submission Process: Material should be emailed to katt.massey@prcms.com or mailed to Katt Massey, 1721 Hagy Blvd. Amarillo, Texas 79106. A recent photograph of the author (optional) and a curriculum vitae or biographical summary are also to be submitted.

Conflict of Interest: Authors must disclose any conflict of interest that may exist in relation to their submissions.

Journal Articles: Manuscripts should be double-spaced with ample margins. Text should be narrative with complete sentences and logical subheadings. The word count is generally 1200 to 1500 words. Review articles and original contributions should be accompanied by and abstract of no more that 150 words.

Submission Process: Material should be emailed to katt.massey@prcms.com or mailed to Katt Massey, 1721 Hagy Blvd. Amarillo, Texas 79106. A recent photograph of the author (optional) and a curriculum vitae or biographical summary are also to be submitted.

References: References to scientific publications should be listed in numerical order at the end of the article with reference numbers placed in parentheses at appropriate points in text. The minimum acceptable data should include:

Journals: Authors, article title, journal, year volume, issues number, inclusive pages.
Books: Author, title, place of publication, publisher, year.
Websites: URL of the site and the date the information was accessed.

Other Sources: Enough information must be included so that the source can be Identified and retrieved. If not possible, the information for source should be included in parenthetically in the text.

Illustrations: Illustrations should be black and white only with complete-sentence legend.

Previously Published Material: Short verbatim quotations in the text may be used without permission but should be quoted exactly with source credited. Otherwise, permission should be obtained in writing from the publishers

Editing: Accepted manuscripts are edited in accordance with the *American Medical Association Manual of Style.*

Letters: Letters will be published at the discretion of the editor and editorial board. The length should be within 400 words. References should not exceed five. All letters are subject to editing and abridgement.

News: News should be emailed to katt.massey@prcms.com or mailed to Katt Massey, PRCMS 1721 Hagy Blvd. Amarillo, Texas 79106.

Obituaries: Listings of deceased members of PRCMS with highlights of their contributions are published with adequate information is availble.

Point of View: Opinions published in any article, statement, or advertisement are the responsibility of the author and shall not be construed by any means to represent those of the editors or the medical society.

The Impact of Artificial Intelligence on Medical Imaging

by April Bailey, MD

INTRODUCTION

Artificial Intelligence (AI) has revolutionized numerous industries, with healthcare being one of the most significantly impacted sectors. Within healthcare, diagnostic medical imaging and radiology stand out as fields that have embraced AI-driven advancements to enhance efficiency, accuracy, and patient care. AI has the potential to improve diagnostic precision, reduce human error, and optimize workflow processes. This is not an exhaustive review, but in it I will explore the current applications of AI in radiology, future possibilities, and medico-legal implications. I hope to provide a framework for the practical implementation of AI in radiology departments.

CURRENT APPLICATIONS OF AI IN RADIOLOGY

AI is currently being utilized in various aspects of radiology to assist radiologists in interpreting medical images, detecting abnormalities, and streamlining operations. Some key applications include:

1. Automated Image Analysis: AI algorithms, particularly deep learning models, have been trained to analyze radiological images such as X-rays, MRIs, CT scans, and ultrasounds. These models can identify abnormalities (such as tumors, fractures, hemorrhages, and infections) with high accuracy. This type of AI can track tumors through time, automatically measuring lesions and comparing to prior images. This can be used prospectively, to encourage radiologists to read low-risk studies faster; or, when used after the fact, as a double-check method (both of which have been reported to increase radiologist confidence).

2. Computer-Aided Detection and Diagnosis (CAD): CAD systems assist radiologists by highlighting potential areas of concern, reducing oversight errors, and enhancing early detection of diseases like cancer, tuberculosis, and pneumonia. Traditional CAD has been used for decades in mammography but originally did not have the deeper

learning capabilities of newer AI-powered CAD tools, which are more accurate and improve radiologist efficiency. CAD is also in current use to identify endotracheal tubes and pneumothoraces in radiographs, but is not universally employed for this purpose.

3. Workflow Optimization: AI automates administrative tasks such as image sorting, report generation, and triage of urgent cases, thereby improving efficiency and allowing radiologists to focus on complex diagnoses.

4. Quantitative Imaging: AI can provide precise measurements and quantitative assessments of tissue characteristics from imaging studies. These automated processes can allow radiologists to read more efficiently, as the pertinent findings are automatically measured in advance of radiologist interpretation. Current examples include automatic segmentation of the prostate on MRI for screening and lesion detection, as well as automated measurement of stenoses on coronary CTA (to an extent not visible with the human eye, but automatically calculated in advance), all enabling better disease monitoring and personalized treatment planning.

5. Integration with PACS and RIS: AI is increasingly integrated with Picture Archiving and Communication Systems (PACS) and Radiology Information Systems (RIS) to facilitate seamless workflow and improve data accessibility.

6. Automated Radiology Reporting: AI may generate fully structured radiology reports with natural language processing (NLP), reducing reporting time and standardizing interpretations. Radiologists have long used voice recognition (converting speech to text), but language processing can create an organized report from free or disorganized speech and can automatically recognize important findings that should populate the conclusion.

FUTURE POSSIBILITIES OF AI IN RADIOLOGY

As AI technology continues to evolve, its future applications in radiology hold immense potential:

1. Advanced Predictive Analytics: AI models could be trained to predict disease progression, enabling early intervention and preventive care strategies.

2. Real-Time Image Interpretation: AI-assisted real-time image analysis in emergency settings could provide instant feedback to radiologists and physicians, reducing diagnostic delays.

3. AI-Driven Personalized Medicine: AI could aid in tailoring treatment plans based on patient-specific imaging biomarkers, enhancing precision medicine approaches.

4. Integration with Multimodal Data: Future AI systems may integrate imaging data with clinical, genetic, and laboratory data to provide comprehensive diagnostic insights.

MEDICO-LEGAL IMPLICATIONS OF AI IN RADIOLOGY

Despite its benefits, AI in radiology presents several medico-legal challenges that must be addressed to ensure ethical and lawful implementation:

1. Liability and Accountability: Determining liability in cases of misdiagnosis or errors involving AI-assisted interpretations remains a legal gray area. Questions arise over whether the responsibility falls on the radiologist, the AI developer, or the healthcare institution. Scrutinizing AI options prior to implementation and ensuring that the systems already in place are working properly may become a focus for future radiologists.

2. Regulatory Compliance: AI applications must adhere to stringent regulatory standards such as the FDA in the U.S., EMA (European Medicines Agency) in the European Union, and MHRA (Medications and Healthcare products Regulatory Agency) in the U.K. for approvals to ensure patient safety and efficacy.

3. Patient Privacy and Data Security: The use of AI involves large-scale data processing, raising concerns over data privacy, security breaches, and compliance with regulations like HIPAA in the U.S. and GDPR (General Data Protection Regulation) in the E.U.

4. Bias and Fairness: AI models trained on biased datasets may produce skewed results, leading to disparities in diagnosis and treatment. Ensuring diverse and representative datasets is critical to minimizing bias.

5. Ethical Considerations: The integration of AI in radiology should not replace human expertise but rather should complement it. Radiologists must retain final decision-making authority to uphold patient trust and ethical medical practice.

FRAMEWORK FOR AI IMPLEMENTATION IN RADIOLOGY

To successfully implement AI in radiology, a structured framework should be followed:

1. Needs Assessment and Goal Setting:

- o Identify specific areas where AI can enhance workflow and diagnostic accuracy.
- o Define objectives such as reducing workload, improving detection rates, or optimizing report turnaround time.

2. Selection of AI Tools:

- o Evaluate AI solutions based on regulatory approval, clinical validation, and interoperability with

existing infrastructure. This is a pivotal role for radiologists in the healthcare team. They can understand both the imaging needs and the AI tools available to ensure that the correct tool is acquired for their population; this is paramount as there are many options available. All AI is not equal, and, if there is not critical review of the data and the studies used to validate the tool, end-users may not recognize the limitations, resulting poor medical care.

o Consider cloud-based AI platforms for scalability and ease of integration. However, with cloud-based AI, in the event of a loss of connectivity, protocols should be available to allow medical imaging to continue without the AI, and backup methods or patient diversion must be considered.

3. Integration with Existing Systems:
o Ensure seamless integration with PACS, RIS, and electronic health records (EHR).

o Develop protocols for AI-driven image analysis and reporting.

4. Training and Education:
o Provide training programs for radiologists and technicians to familiarize them with AI applications and best practices.

o Conduct workshops on AI ethics, limitations, and validation methods.

o Educate future radiologists. This is a point of concern, as AI can make interpretation much quicker and less taxing, including during training. If future radiologists are not forced to learn how to do the exams manually, they may not be able to interrogate the AI for malfunction; if we lose the understanding and ability to interpret exams without the AI, the implications for future care could be significant.

5. Validation and Continuous Monitoring:

o Validate AI models using real-world clinical data before full-scale deployment.

o Implement a continuous monitoring system to assess AI performance, detect biases, and improve accuracy. The systems used are not infallible. Continuous understanding of function and monitoring for errors is a growing job of the radiologist, in order to oversee the accuracy of the AI used in their particular facility.

6. Ethical and Legal Compliance:
o Establish guidelines for AI accountability and decision-making hierarchy.

o Ensure compliance with data protection laws and ethical AI standards.

7. Patient Communication and Transparency:

o Inform patients about the role of AI in their diagnostic process.

o Address concerns regarding AI-driven diagnoses and ensure that human oversight remains a key component.

CONCLUSION

AI is transforming the field of radiology by enhancing diagnostic accuracy, improving workflow efficiency, and enabling advanced predictive analytics. However, its integration comes with challenges such as medico-legal concerns, ethical implications, and the need for robust regulatory frameworks. A well-structured approach to AI implementation, focusing on education, validation, and compliance, is essential for maximizing its benefits while mitigating potential risks. As AI technology advances, its role in radiology will continue to evolve, ultimately improving patient outcomes and the overall healthcare landscape.

REFERENCES

1. McKinney SM, Sieniek M, Godbole V, et al. International evaluation of an AI system for breast cancer screening. Nature. 2020; 577(7788): 89-94.
2. Wang X, Peng Y, Lu L, et al. (2017). ChestX-ray8: Hospital-scale chest X-ray database and benchmarks on weakly-supervised classification and localization of common thorax diseases. IEEE Conference on Computer Vision and Pattern Recognition (CVPR). 2017; 2097-2106.
3. European Society of Radiology (ESR). Impact of AI on radiology: A European perspective. Insights into Imaging. 2019; 10(1): 44.
4. Langlotz CP. Will artificial intelligence replace radiologists? Radiology: Artificial Intelligence. 2019; 1(3): e190058.
5. Topol E. High-performance medicine: The convergence of human and artificial intelligence. Nature Medicine. 2019; 25(1), 44-56.

April Bailey, MD is a radiologist with High Plains Radiological Association. She has enjoyed being with the group since 2017 and looks forward to caring for people in the Texas panhandle for many years to come. Her fellowship training is women's imaging (obstetric and gynecologic care) as well as body MRI.

The Role of Artificial Intelligence in Oncology: Enhancing Diagnostics, Treatment Personalization, Outcome Prediction, Drug Discovery, and Administrative Efficiency

by Jade Anderson, MD

Artificial intelligence (AI) is revolutionizing oncology by advancing diagnostics, personalizing treatments, predicting outcomes, accelerating drug discovery, and streamlining administrative tasks. This integration enhances physician capabilities and significantly improves patient care. There is no doubt that AI will have a profound impact in the diagnosis, treatment and business of oncology. It will result in a revolution of new therapies and diagnostic tests and will profoundly transform the science and the business of oncology very quickly—probably over the next 10 years.

AI IN CANCER DIAGNOSTICS

AI has demonstrated remarkable proficiency in cancer diagnostics, particularly in medical imaging. For instance, a study involving 461,818 women in Germany revealed that incorporating AI into breast cancer screening increased detection rates by 17.6% without raising false positives. The AI system effectively identified suspicious areas that radiologists had missed, suggesting re-examinations and thereby enhancing diagnostic accuracy (1).

In pathology, AI has been instrumental in analyzing histological slides to identify cancerous tissues. Researchers at Harvard Medical School developed an AI model named "Chief," capable of detecting multiple cancer types with an accuracy of up to 94% (2). Chief's ability to link tumor cell patterns to genomic aberrations facilitates early identification of patients who may benefit from specific molecular treatments, even in regions lacking advanced genetic testing facilities.

Additionally, AI has been utilized to predict the aggressiveness of cancers. For example, a study reported the use of AI for CT-based radiomics classification as a way of grading the aggressiveness of retroperitoneal sarcoma. The AI platform had an accuracy of 82%, compared to 44% for lab analysis of biopsies (3).

AI IN TREATMENT PERSONALIZATION

Personalizing cancer treatment is crucial for improving patient outcomes, and AI can play a pivotal role in this domain. Artera, a medical software company, utilizes AI to analyze extensive datasets of patient records and biopsy images, developing customized treatment plans for prostate cancer (4). This approach helps balance the risks of over-treatment and under-treatment, ensuring patients receive therapies tailored to their specific conditions.

Moreover, AI-driven platforms like TumorScope by SimBioSys simulate individual tumors and their microenvironments using standard diagnostic data. This simulation predicts how tumors will respond to various therapies, enabling oncologists to select the most effective treatment strategies. A pivotal study at the University of Chicago demonstrated that TumorScope achieved 91% sensitivity and 93% specificity in predicting complete responses to therapies available at time of initial diagnosis (5).

At Queen's University Belfast, researchers are integrating clinical, pathological, genomic, and socioeconomic data from patients across Ireland to advance personalized medicine for prostate cancer. By leveraging AI, they aim to identify biomarkers that can predict disease progression and treatment efficacy, ensuring patients receive optimal therapies while minimizing side effects (6).

AI IN OUTCOME PREDICTION

Accurately predicting patient outcomes is vital for effective cancer management, and AI has shown promise in this area. Radiomics, a field that extracts quantitative features from medical images, has been utilized to predict clinical outcomes. A large-scale study involving over 1,000 patients with lung and head-and-neck cancers identified radiomic features that could identify intratumoral heterogeneity and predict patient survival. These findings suggest that AI can provide valuable prognostic information, aiding clinicians in making informed decisions (7).

Additionally, AI models have been developed to predict treatment responses. For example, changes in radiomic features over time have been used as biomarkers to predict treatment responses in pancreatic cancer patients. An AI model achieved an area under the curve (AUC) of 0.94 in distinguishing between good and poor responders after 2–4 weeks of treatment, highlighting its potential to guide adjustments in therapy at an early date (7).

Furthermore, AI has been employed to identify patients at risk of relapse. For instance, Owkin's AI diagnostic tool, MSIntuit CRC, screens patients for microsatellite instability (MSI), a key genomic biomarker in colorectal cancer; this helps to predict disease recurrence and to inform treatment decisions (8).

AI IN DRUG DISCOVERY

AI is revolutionizing drug discovery in oncology by expediting the identification and development of novel therapeutics. For example, Iambic Therapeutics introduced an AI model named "Enchant," capable of predicting early-stage drug performance with high accuracy, potentially reducing the cost and time required for drug development by significantly lowering failure rates in later stages (9).

Additionally, the MIT Jameel Clinic has leveraged AI to discover new antibiotics and develop early cancer detection platforms, demonstrating AI's potential in accelerating drug discovery and improving diagnostic accuracy (10).

Furthermore, a proteomics initiative by the UK Biobank, in collaboration with 14 pharmaceutical companies, aims to utilize AI in comprehending and treating diseases. By analyzing extensive genetic data, the project seeks to train AI models to identify precise disease subtypes, allowing for tailored treatments (11).

AI IN ADMINISTRATIVE EFFICIENCY

Beyond clinical applications, AI significantly enhances administrative tasks in oncology, particularly in patient documentation, coding, and billing. For instance, Abridge, an AI-powered documentation platform, records doctor-patient conversations (with consent), generates summaries for medical records, and streamlines billing and coding processes. This innovation reduces the administrative burden on physicians, allowing them to focus more on patient care (12).

Similarly, Charta Health automates the patient chart review process using AI, enabling providers to complete administrative tasks more efficiently and increasing revenue by identifying missed codes and preventing claims denials. Within 60 days of outreach, Charta achieved profitability with $500,000 in revenue, highlighting the financial benefits of AI integration in administrative processes (13).

CONCLUSION

Artificial intelligence is profoundly reshaping the field of oncology by advancing diagnostic accuracy, enabling personalized treatment strategies, predicting patient outcomes with greater precision, and accelerating drug discovery. AI's impact extends beyond clinical applications into administrative efficiency, reducing the burden of documentation, coding, and billing on healthcare professionals. By integrating AI-driven tools into oncology practices, physicians can focus more on patient care, ensure more accurate treatment decisions, and streamline operational workflows. AI-powered platforms are not only improving survival rates by detecting cancer earlier and personalizing treatments but are also transforming the economic landscape of healthcare by optimizing resource allocation. As AI continues to evolve, its integration into oncology promises to usher in a new era of precision medicine that benefits both physicians and patients, ultimately leading to better healthcare outcomes.

REFERENCES

1. "More breast cancer cases found when AI used in screenings, study finds." The Guardian. Available at: https://www.theguardian.com/society/2025/jan/07/more-breast-cancer-cases-found-when-ai-used-in-screenings-study-finds
2. "AI breakthrough raises hopes for better cancer diagnosis." Financial Times. Available at: https://www.ft.com/content/0a8f2c61-77f4-43ce-87d2-a7b421bbda85
3. "Artificial Intelligence in Healthcare." Wikipedia. Available at: https://en.wikipedia.org/wiki/Artificial_intelligence_in_healthcare
4. "ArteraAI's multimodal artificial intelligence in prostate cancer." Time. Available at: https://time.com/7094698/arterai-multimodal-artificial-intelligence/
5. "SimBioSys TumorScope: Spatio-temporal modeling of the tumor microenvironment to predict chemotherapeutic response." Journal of Clinical Oncology. Available at: https://ascopubs.org/doi/10.1200/JCO.2020.38.15_suppl.e14146
6. "Prostate cancer and AI: The exciting advances that could transform treatment." The Guardian. Available at: https://www.theguardian.com/research-to-reality/2025/jan/24/prostate-cancer-and-ai-the-exciting-advances-that-could-transform-treatment
7. "Radiomics: AI-driven imaging analysis in oncology." Wikipedia. Available at: https://en.wikipedia.org/wiki/Radiomics
8. "Owkin: AI-powered colorectal cancer screening tool MSIntuit CRC." Wikipedia. Available at: https://en.wikipedia.org/wiki/Owkin
9. "Nvidia-backed AI firm Iambic unveils drug discovery breakthrough." Wall Street Journal. Available at: https://www.wsj.com/tech/ai/manas-ai-drug-discovery-reid-hoffman-93a6c023
10. "MIT Jameel Clinic: AI-driven drug discovery and cancer detection." Wikipedia. Available at: https://en.wikipedia.org/wiki/In_silico_medicine
11. "FT's proteomics initiative and AI-powered precision medicine research." Financial Times. Available at: https://www.ft.com/content/cc2ec1ae-f514-427b-94af-b865a28df7c3
12. "Abridge: AI-powered medical documentation and billing." Time. Available at: https://time.com/7094840/abridge/
13. "Charta Health raises $8 million to automate medical charting and coding." Business Insider. Available at: https://www.businessinsider.com/charta-health-8-million-seed-round-pitch-deck-2025-2

Jade Anderson made the decision to move his hematology/oncology practice from Minneapolis, Minnesota to Amarillo, TX one year ago. Jade says that the whole medical community has been wonderful and has made his move an easy transition. He now practices with the Texas Oncology group.

AI in Drug Discovery and Development

by Mahmoud Salama Ahmed, B.Pharm, PhD
Assistant Professor of Pharmaceutical Sciences, Jerry H. Hodge School of Pharmacy, Texas Tech University Health Sciences Center

In 2021, Demis Hassabis and John Jumper, from Google DeepMind, introduced a valuable tool (Alphafold), which recruited artificial intelligence to predict sophisticated protein complex structures and to identify potential new drugs targeted for those proteins (1). Three years later, in October 2024, the Royal Swedish Academy of Sciences awarded the Nobel prize in chemistry to three scientists who "cracked the code of protein structures and solved a 50-year-old problem," with one half going to David Baker of the University of Washington and the other half to Hassabis and Jumper (https://www.nobelprize.org/prizes/chemistry/2024/press-release/).

However, application of virtual screening and computational molecular simulations as a way to predict the interactions and dynamics of drugs towards different proteins, receptors, and/or enzymes is not new. It has been an active area of inquiry since the 1980s. But the introduction of AI, with its ability to analyze and evaluate billions of data points, has brought new power and efficiency to virtual drug development.

Drug discovery is a complex and time-consuming process; 10-15 years are typically required to deliver a single molecule to the market. This costs around $2.6 billion US dollars for each new active pharmaceutical ingredient (2). Typically, the preclinical stage involves molecular target identification, development of active compounds (hits/leads), lead optimization, and animal safety/efficacy testing. This is then followed by the three phases of the clinical trials process, prior to FDA approval and launch. Due to the uncertainties and costs of this approach, the term "Valley of Death" has been used to describe the challenges and risks associated with new drug development.

AI can contribute to preclinical phases of this process to save time, effort, and expense. AI-driven drug discovery can predict the protein structure (if previously unknown) as well as the potential hits/leads prior to synthesis. It can then analyze the subsequently synthesized chemicals for better efficacy and safety/toxicity.

In this paper, I will highlight some examples of the contribution of AI in different preclinical stages and clinical trials, as well as in real-world practice.

UNDERSTANDING THE DRUG-PROTEIN INTERACTIONS

As mentioned earlier, understanding the drug-protein interactions is the gate keeper that allows us to predict the required structural iterations with optimum efficacy. Furthermore, the chemical structure of any drug is a treasure by itself, now that we can predict the pharmacokinetic behavior of the drug (as well as undesirable toxicity events) within our physiological systems. Recently, we have been able to perform virtual screening of giga-size libraries (>31 billion compounds) against a protein of interest to predict potential interactions and to sort them prior to outlining the synthetic routes (3).

PLANNING FOR SYNTHETIC CHEMISTRY

I have to share my bias as a medicinal chemist about the synthetic chemistry phase; I will not exaggerate to say that this is the rate-limiting step for the success of the drug development. Synthesis of a new drug requires high expertise to assemble and glue the molecular building blocks together to create a new chemical entity with efficacy and safety. I suspect that this step is still irreplaceable by AI due to its sophistication and extreme labor. However, computer-aided synthesis planning (CASP) can support proper understanding of molecular assembly by retrospective analysis and enhanced decision-making, thus saving the repetitive laborious tasks for the chemists (3,4).

INTERPRETATION OF CLINICAL TRIALS OUTCOMES

Clinicians have successfully recruited AI in the clinical trial process, using AI to monitor multiple parameters, thus building huge databases including (but not limited to) basic patient data, genetic information, clinical history, and lifestyle factors. This can help clinicians calculate and identify the number of volunteers required to monitor the biomarkers, efficacy, and patient characteristics (sex, age, weight, metabolic state, etc.) that influence drug responses. Different AI tools can tailor drug dosing and identify potential adverse effects, as well as drug-drug interactions.

In January 2020, Exscientia and Sumitomo Dainippon Pharma from Japan announced "The first AI-designed drug to enter human clinical trials." This was Exscientia's DSP-1181, used to treat obsessive-compulsive disorder (OCD)". Also, Insilico Medicine (a US-based Pharma) has developed INS018_055 for idiopathic pulmonary fibrosis (IPF), which has reached Phase II clinical trials, using AI-driven methods of discovery and development (https://www.cas.org/resources/cas-insights/ai-drug-discovery-assessing-the-first-ai-designed-drug-candidates-to-go-into-human-clinical-trials)

MOLECULAR TARGET IDENTIFICATION AND THE POTENTIAL FOR PERSONALIZED MEDICINE

Now that we are living in the era of multi-omics and huge data sets, personalized medicine becomes possible, where AI can help scientists figure out specific mutations for certain population of patients. This can help to develop algorithms and databases to elucidate gene mutations and explain malfunctioning proteins/enzymes.

AI AND DRUG REPURPOSING

COVID time was a revealing moment for the drug development process; it literally raised the four centuries-old question "To be, or not to be?" Different pharma companies started to look at their chemical libraries as a way to tackle the replication of this virus.

This was an eureka moment for drug repurposing, leading to the discovery of previously unidentified therapeutic properties of already FDA-approved and/or launched drugs. This was like teaching old drugs new tricks, with novel molecular targets and previously unidentified clinical indications. Additionally, the financials of drug repurposing are significantly more favorable than the classical drug development process. Drug repurposing usually costs around $300 million US dollars for the 6-year process (5), compared to $2.6 billion for the 10-15 year process involved in the development of a new molecule.

In the years before AI-driven drug development, serendipitous events (based on clinical observations rather than intentional design) helped uncover new clinical indications for old drugs. Examples include sildenafil for erectile dysfunction, semaglutide for weight loss, and empagliflozin for heart failure with reduced ejection fraction. We and others have adopted virtual screening of existing drugs as a way to understand previously unrecognized drug-protein interactions. We then use molecular target validation in rodents to repurpose old, previously approved drugs for new clinical indications. These drugs have been in the pharmaceutical market for years; their safety profiles have already been well studied. This decreases the time and expense needed to gain approval for the new indication.

Our research group at TTUHSC, in collaboration with the University of Texas Southwestern Medical Center, has already identified several different drugs based on structure-based drug repurposing, including drugs with potential utility for SARS-CoV-2 (6), heart failure (7), chronic inflammatory pain (8), and hereditary cardiomyopathy due to gene mutations (9).

CHALLENGES AND FUTURE DIRECTIONS

Despite huge advancement in the AI tools to de-risk the drug discovery process, there are still some challenges related to technical feasibility, so that even now the process is not fully automated. Drug development still needs the refinement and involvement of human expertise in decision-making, identification of go/no-go milestone criteria, and choice of specific leads for pharmacological and toxicological evaluations. The above-mentioned calculations still need high computational resources that will require collaboration and further investment from cloud providers. Most drug discovery experts can foresee AI as a tool to expedite the drug development process while complementing the human capabilities for governance and decision-making.

REFERENCES:

1. AlphaFold. Nature. 2021; 596: 583-589. https://doi.org:10.1038/s41586-021-03819-2
2 DiMasi JA, Grabowski HG, Hansen RW. Innovation in the pharmaceutical industry: new estimates of R&D costs. Journal of Health Economics. 2016; 47: 20-33.

3 Gentile F, Yaacoub JC, Gleave J, et al. Artificial intelligence–enabled virtual screening of ultra-large chemical libraries with deep docking. Nature Protocols. 2022; 17: 672-697. https://doi.org:10.1038/s41596-021-00659-2

4 Zhang K, Yang X, Wang Y, et al. Artificial intelligence in drug development. Nature Medicine. 2025; 31: 45-59. https://doi.org:10.1038/s41591-024-03434-4

5 Nosengo N. Can you teach old drugs new tricks? Nature. 2016; 534: 314-316. https://doi.org:10.1038/534314a

6 Ahmed MS, Farag AB, Boys IN, et al. FDA approved drugs with antiviral activity against SARS-CoV-2: From structure-based repurposing to host-specific mechanisms. Biomed Pharmacother. 2023; 162: 114614. https://doi.org:10.1016/j.biopha.2023.114614

7 Ahmed MS, Nguyen NUN, Nakada Y, et al. Identification of FDA-approved drugs that induce heart regeneration in mammals. Nature Cardiovascular Research. 2024; 3: 372-388. https://doi.org:10.1038/s44161-024-00450-y

8 Ahmed MS, Wang P, Nguyen NUN, et al. Identification of tetracycline combinations as EphB1 tyrosine kinase inhibitors for treatment of neuropathic pain. Proc Natl Acad Sci U S A. 2021; 118. https://doi.org:10.1073/pnas.2016265118

9 Wang P, Ahmed MS, Nguyen NUN, et al. An FDA-approved drug structurally and phenotypically corrects the K210del mutation in genetic cardiomyopathy models. J Clin Invest. 2025; 135. https://doi.org:10.1172/jci174081

Dr. Mahmoud Salama Ahmed is an assistant professor in the department of pharmaceutical sciences at Texas Tech University Health Sciences Center (TTUHSC). Prior to TTUHSC, he was trained as a medicinal chemist and received his PhD from the department of chemistry and biochemistry at South Dakota State University (SDSU). Then, he joined Kemin Industries, in Iowa as a postdoctoral research scientist. In 2018, he joined UT Southwestern Medical Center as a research instructor. Dr. Ahmed's research program at TTUHSC focuses on recruiting drug discovery tools including structure-based drug design, organic synthesis, X-ray crystallography, and in vitro/in vivo biological evaluation to modulate different clinical diseases using small molecules. Dr. Ahmed's articles have appeared in prestigious peer-reviewed journals including Nature, Nature Metabolism, Nature Cardiovascular, Proceedings of The National Academy of Sciences, and European Journal of Medicinal Chemistry

walk® with a DOC

educate. exercise. empower.

TAKE A **STEP** TOWARD BETTER HEALTH

This walking program is a fun and safe place to take a walk (at your own pace), learn health tips from local healthcare professionals, and meet new people. The events are **FREE** and all are welcome!

We walk the
3rd Saturday of every
month at 9:30 AM

Walk Locations:

Odd Months:
Martin Road Park
(by skate park)

Even months:
John Ward Park/Medi Park
(by AMBUCS park & the
Discovery Center)

SCAN TO LEARN MORE:

WALKwithaDOC.org

The Use of Artificial Intelligence in Pharmacy Practice

by Chandler Batson, PharmD Candidate
TTUHSC Jerry Hodge School of Pharmacy

INTRODUCTION

Artificial Intelligence (AI) is rapidly reshaping healthcare, providing new ways to approach patient care, decision-making, and everyday tasks. From assisting with literature evaluation and improving clinical decision support to streamlining documentation, AI aims to enhance workflows and keep practitioners informed. However, as its potential for integration into daily practice grows, so does the need for responsible implementation. AI should complement, not replace, professional judgment and expertise. For pharmacists, there should be a balance between adapting to this innovation while also maintaining critical thinking to enhance patient care without compromising safety.

LITERATURE EVALUATION AND CLINICAL DECISION SUPPORT

An essential part of everyday practice as a pharmacist is the ability to find, evaluate, and apply current literature to clinical practice. With rapid changes in medical knowledge, staying up-to-date can be challenging. AI tools can help streamline this process, making pertinent data more accessible and efficient. Several free AI programs such as ChatGPT, OpenEvidence, and Pathway AI can help retrieve relevant information and critically assess literature, which can assist in providing evidence-based answers to clinical questions. In addition, AI can be very useful to assist in evaluating literature by summarizing key findings, organizing information into a chart, and identifying strengths and limitations, especially when provided with clear evaluation criteria ahead of time.

Platforms specifically designed for healthcare professionals, such as OpenEvidence and Pathway AI, offer more reliable sources of medical information than ChatGPT. For example, in early 2025, OpenEvidence further strengthened its credibility by securing a contract with the New England Journal of Medicine (NEJM), allowing it to incorporate high-quality, peer-reviewed content in its responses. Similarly, PathwayAI emphasizes its commitment to accuracy by sourcing information from "authoritative and evidence-based sources," ensuring that "every statement is traceable to its original, reputable source" (1). AI programs such as these, tailored for healthcare professionals, are designed to pull the most relevant and reliable information for clinical inquiries.

However, while these AI tools are helpful, they are not without limitations. Currently, many AI tools like ChatGPT may generate inaccurate or even fabricated information. When searching for clinical answers, pharmacists must be cautious about accepting AI-generated responses at face value, as these programs can combine information from various sources, occasionally leading to errors or inconsistencies. One article evaluating the accuracy of AI found that ChatGPT incorrectly identified 67% of articles reviewed (2). Additionally, there was a trend for AI, when it lacked an answer, to generate a plausible-sounding speculative response, instead of acknowledging its inability to answer. Furthermore, another investigation showed that ChatGPT, when challenged with pharmacist-developed questions, came up with inaccurate or incomplete responses to 74% of questions (3). For example, when questioned to provide conversion of a muscle spasm medication from injectable to oral formulation, two different sources were cited that did not support the guidance AI provided. Even worse, the AI-generated answer was off by a factor of 1,000. This is just one example of a significant medical error that could occur if a pharmacist relied on ChatGPT for original clinical information.

To help mitigate the risk of misinformation, one should always request the citations and verify sources to ensure legitimacy, any time AI is employed to answer questions. Alternatively, to improve reliability and increase the accuracy of responses, one can upload documents (journal articles, guidelines, etc.) for AI to consult in generating its responses. This forces the AI tool to provide answers that are based on original content and allows pharmacists to comprehend and make well-informed decisions based on current literature. While the use of AI does not replace the pharmacist's own critical evaluation, it can support and improve the efficiency of that process.

DOCUMENTATION AND COMMUNICATION

Documentation is a crucial aspect of a pharmacist's role, whether for SOAP notes, consultations, or interventions. AI can streamline this process, which may allow clinicians to allocate more time to patient care and other responsibilities. Many commercial-compliant AI documentation platforms can convert written or verbal information into a structured SOAP note, which the clinician can then review and refine. Additionally, written communication is vital for interprofessional collaboration. Pharmacists interact with a wide range of healthcare professionals, making clear and effective communication essential. Numerous

AI tools are available to enhance writing. Platforms such as ChatGPT and Grammarly can assist in generating ideas, drafting emails or consult notes, and fine-tuning emails.

Beyond professional communication, AI can also enhance patient interactions. Translating complex medical information into patient-friendly language can be challenging or time-consuming. AI tools like OpenEvidence and ChatGPT can bridge this gap by creating easy-to-understand educational materials. For example, a prompt might be, "Create a patient handout to explain type 2 diabetes, lifestyle management, metformin, potential side effects, how to take it, how to store it, and when to contact your physician," and OpenEvidence can provide a downloadable document that a pharmacist can review, edit and distribute to their patients. The use of AI to refine and create educational materials can inform and ultimately empower patients. While it can be a helpful tool, AI should not be relied upon to replace professional judgment or to independently generate original or final content. Instead, it should serve as a tool to optimize workflow, reinforce existing knowledge, and direct users toward credible sources. Careful review and validation of AI-generated information is crucial before it reaches colleagues or patients.

THE FUTURE

As the integration of AI into clinical practice expands and technologies improve, it will continue to impact how healthcare professionals engage with medical literature, manage documentation, and interact with patients. In the future, pharmacists may utilize AI for tasks such as scheduling, identifying high-risk patients for adverse drug effects, assisting with prior authorizations, monitoring patient adherence, and refining clinical protocols. While AI offers numerous benefits to the modern pharmacist, it also poses potential risks that must be carefully considered. By verifying all AI-generated content and understanding AI's limitations, pharmacists can utilize these tools to ultimately enhance patient care.

ACKNOWLEDGMENTS: This article was written with the assistance and guidance of Sherry Luedtke, PharmD, FPPA

REFERENCES:

1. OpenEvidence. [cited 2025 Apr 2]. Available from: https://www.openevidence.com/
2. Jazwinska K, Chandrasekar A. AI search has a citation problem. Columbia Journalism Review. 2025 Mar [cited 2025 Apr 2]. Available from: https://www.cjr.org/tow_center/we-compared-eight-ai-search-engines-theyre-all-bad-at-citing-news.php
3. Blum K. Watch out for fake, AI-generated medical information. Association of Health Care Journalists. 2023 Dec [cited 2025 Apr 2]. Available from: https://healthjournalism.org/blog/2023/12/watch-out-for-fake-ai-generated-medical-information/

Chandler Batson is a fourth-year pharmacy student at TTUHSC. Following graduation, she will continue her clinical training as a PGY1 pharmacy resident at the Medical University of South Carolina..

Coping with Code: AI in Psychiatry

by Benjamin Greif, MS4, Nick Hancock, MS4, Krystal Morton, MS4

The greatest advancements in science often conjure up the greatest fear and hesitancy in society. This, of course, is for good measure; humanity many times rides on the precipice of expansion with tools that could lead to our destruction. Artificial intelligence, a term first entering the global consciousness in the 1950's, has gone through the societal wringer, striking terror into the hearts of some individuals with Kubrick's 2001: A Space Odyssey or Mr. Schwarzenegger's chilling robot of mass destruction in the Terminator series. These films did not exactly highlight the potential benefits of artificial intelligence.

However, artificial intelligence as it exists today is far removed from these portrayals of super intelligence. Current AI technology does not possess common sense or high-level reasoning. AI technology in medicine functions to extrapolate information from large data sets in order to provide potential solutions to practical problems. This process of extrapolation is based on machine learning that can pull data from many sources, including internet chatbots, wearable devices like Apple Watches, EHR data, EEG information, and imaging (including MRI, PET or CT scans), just to name a few. The endless possibilities of AI raise the question of how best to use it in fields that would be most beneficial to humanity. One field in particular--psychiatry--continues to grow in prevalence. As of 2022, the National Institute of Health published data showing that there were 59.3 million adults in the United States with a mental illness--almost a fourth of all adults in the country (1). Could artificial intelligence help in treating mental health disorders, and has it begun to do so already?

EARLY EXPERIENCE AND ITS EXPANSION

The early history of artificial intelligence in psychiatry offers intriguing parallels to today's developments. In the 1960s, Joseph Weizenbaum, a computer scientist, created a program named ELIZA, designed to simulate Rogerian therapy through simple pattern-matching techniques (2). In Rogerian therapy, the patient leads with their feelings and reflections while a therapist tries to understand with empathy and acceptance. Ironically, Weizenbaum intended ELIZA as a satirical demonstration of computers' inability to form genuine human connections. To his surprise, many people (including practicing psychiatrists) found benefit in the program and saw its therapeutic potential, despite its rudimentary nature compared to today's AI systems.

Dr. Rodney Young, Dr. Fred Poage, Dr. Raphael Mattamal, Dr. Reddy Biggs, Dr. Brittany Eghe, Dr. Nicole Lopez

Have you met Ellie?

TEXMED 25

ADVOCATE • EDUCATE • INNOVATE

MAY 8-10 | JW MARRIOTT SAN ANTONIO HILL COUNTRY RESORT

Katt Massey with Lubbock County ED, Elizabeth Polk.

TexMed 2025 was a success.
We had all 5 delegates participate virtually and in person. We had an extra vote with Review Committee member,
Dr. Lopez, and one with Resident Member,
Dr. Brittany Eghe.

This early experiment foreshadowed current applications where AI is already making meaningful contributions to mental healthcare. Today's AI systems have the potential to train future psychiatrists by simulating speech patterns characteristic of various psychological conditions, supplementing traditional therapy approaches, and streamlining clinical documentation by assisting with patient notes. While these applications are valuable, perhaps AI's greatest potential lies in addressing the critical shortage of mental healthcare providers across the United States.

THE NATIONAL SHORTAGE OF MENTAL HEALTH PRACTITIONERS

The accessibility crisis in mental healthcare has reached alarming proportions, with 60 percent of mental health professionals not accepting new patients as of 2022, and more than half of U.S. counties lacking a single psychiatrist (2). These statistics highlight why AI-assisted mental health support, despite its limitations, represents a vital resource in regions where traditional care remains inaccessible. This reality becomes particularly relevant in rural areas like West Texas, where geographical isolation compounds the difficulty of connecting patients with qualified psychiatric providers. In such environments, AI-powered mental health support may serve as an imperfect but essential lifeline for those who would otherwise receive no care at all.

ROBOTICS IN MENTAL HEALTH—SOCIALLY ASSISTIVE ROBOTS

Much like artificial intelligence, the field of robotics is ever changing, with the potential to reshape the way humans approach life and their professions. While robotic assistance has been used in larger processes like manufacturing for quite some time, robots have been underutilized in the field of medicine. However, closer analysis of SAR, or socially assistive robotics, may lead to greater innovation both in medicine and, specifically, in psychiatry. SAR is a field that combines the principles of robotics, engineering, medicine, and psychology to create responsive robots that can assist humans in day-to-day function and can actually improve their quality of life (3). These unassuming robot companions utilize artificial intelligence by integrating gestures, speech, facial expression recognition, and movement to understand and assist their users. As the SAR spends more time with its user, the artificial intelligence programming of the SAR advances in its ability to recognize the user's tendencies, becoming increasingly adept at assisting the user and their needs (4). SARs have had great success, for instance, in helping elderly patients with their rehabilitation, as well as assisting patients with weight loss by providing them with coaching and conversation about their goals and progress (5).

SARs have made a similar impact in mental health care and appear to have a promising future. Studies conducted in nursing home populations have shown that patients who interact on a consistent basis with a SAR have significantly reduced levels of loneliness compared to those who do not. Surprisingly, SAR's ability to decrease loneliness is similar to that of therapy dogs. With their adaptability, SARs go beyond only treating loneliness. In patients with autism spectrum disorder, for instance, SARs help assist in modeling behavior by engaging the children in tasks and serving as a partner for the child to practice social skills in a lower stress environment (6). While these interventions are certainly helpful for development, there are some limitations; children had difficulty in translating the skills learned from interactions with SARs to interacting and socializing with their peers. With further adaptations and development, however, SARs could prove to be invaluable for a range of people with behavioral and mental health disorders.

INTEGRATION OF AI INTO THE PRACTICE OF PSYCHIATRY: SOME PITFALLS

Undoubtedly, there are pitfalls in the reach of AI in medicine as it stands today. One must first acknowledge the productivity paradox that all technology faces. The productivity of artificial intelligence can be quantified by what NASA calls technology readiness levels, with nine separate levels signifying the maturity of said technology. The first three levels mainly concern the inception of the technology at hand, with application and function of the technology at the forefront. Levels four and five concern validity of the technology, with testing occurring in a laboratory environment (level 4) and a relevant environment (level 5). Levels six through nine signify completion or "maturity" of the technology, including demonstration of the technology through successful trial runs and real-world scenarios (7). Unfortunately, artificial intelligence in medicine has been stuck at levels four and five. One investigation in particular analyzed 172 studies where machine learning was used within the context of intensive care and revealed that 93% of ICUs had a technology readiness level of four or below (8). The barriers preventing artificial intelligence from escaping adolescence and attaining a full technology readiness level might be more complex than one would think. Why might this be?

For one thing, artificial intelligence is mainly reliant on data collection; yet medicine is an ever-changing field. Factors such as standards of care, disease prevalence, and population demographics (to name a few) are constantly evolving, yet the data input falls behind, leaving artificial intelligence running to catch up (8). Furthermore, in the data collected by AI, differing environments, cultures, and exposures are not kept uniform as one would in an experiment, thus making the aid of AI fickle in certain situations. For example, the data collected from citizens in New York might not be as applicable and thus less reliable for the citizens in

West Texas--each population is exposed to a different environment with different controls and variables. In addition, while the ability for AI to function relies on data quality, psychiatry more so than other fields has major data collection discrepancies due to under-reporting of mental health disorders, errors in charting, and cultural stigmas surrounding mental health. Indeed, a 2015 study published in the Journal of the American Board of Family Medicine found that only 3% of patients with a mention of suicidal ideation in a physician's note had the proper ICD-9 code entered into their electronic health record (9). Additionally, cultural stigmatization of mental health may cause patients and physicians to underreport symptoms and diagnoses. Depression and suicidal ideation are more difficult topics for patients to broach than, say, indigestion, where a person has no problem going in to receive an antiacid or other medication. Thus, underreporting by physician and patient alike creates skewed data collection; as a result, the information available to artificial intelligence is handicapped.

Overall, artificial intelligence is one of the final frontiers that man has yet to conquer. Its applications are endless, and the potential it holds is both frightening yet promising. In medical specialties such as psychiatry, which are in dire need of assistance, artificial intelligence could enhance, possibly even reform, the way that physicians can offer aid to their patients. That isn't to say that this technology could, or should, ever replace the role of a psychiatrist entirely. A simple Google search on how to cook an egg will give you an AI generated answer with short, summarized, easily digestible steps before one even reaches links to people discussing their first time making an egg, how it felt, and which brand of egg they use. Between the two, the former is faster, more efficient, and based on objective data. The latter is based on emotion and lived experience. Both are valid and relevant, and one shouldn't be used without the other.

Through the analysis of ELIZA and SARs, it is possible to trace the technological leaps that artificial intelligence has made, along with the setbacks it currently faces. If the process of both data input and generalizability are refined, it is possible that AI could make several leaps in the technology readiness levels, bringing this technology closer to a stage in which it can make a substantial impact in the field of psychiatry.

REFERENCES

1. National Institute of Mental Health. Mental Illness. National Institute of Mental Health. Published September 2024. https://www.nimh.nih.gov/health/statistics/mental-illness
2. Khullar D. Can A.I. treat mental illness? The New Yorker. Published February 27, 2023. Accessed April 21, 2025. https://www.newyorker.com/magazine/2023/03/06/can-ai-treat-mental-illness
3. Langer A, Feingold-Polak R, Mueller O, Kellmeyer P, Levy-Tzedek S. Trust in socially assistive robots: Considerations for use in rehabilitation. Neuroscience & Biobehavioral Reviews. 2019;104:231-239. doi:https://doi.org/10.1016/j.neubiorev.2019.07.014
4. Baydili İ, Tasci B, Tasci G. Artificial intelligence in psychiatry: A review of biological and behavioral data analyses. Diagnostics. 2025;15(4):434. doi:https://doi.org/10.3390/diagnostics15040434
5. Koutentakis D, Pilozzi A, Huang X. Designing socially assistive robots for Alzheimer's disease and related dementia patients and their caregivers: Where we are and where we are headed. Healthcare (Basel, Switzerland). 2020;8(2). doi:https://doi.org/10.3390/healthcare8020073
6. Fiske A, Henningsen P, Buyx A. Your robot therapist will see you now: Ethical implications of embodied artificial intelligence in psychiatry, psychology, and psychotherapy. Journal of Medical Internet Research. 2019;21(5). doi:https://doi.org/10.2196/13216
7. Manning C. Technology readiness levels - NASA. National Aeronautics and Space Administration. Published September 27, 2023. https://www.nasa.gov/directorates/somd/space-communications-navigation-program/technology-readiness-levels/
8. Monteith S, Glenn T, Geddes J, Whybrow PC, Achtyes E, Bauer M. Expectations for artificial intelligence (AI) in psychiatry. Current Psychiatry Reports. 2022;24(11):709-721. doi:https://doi.org/10.1007/s11920-022-01378-5
9. Anderson HD, Pace WD, Brandt E, et al. Monitoring suicidal patients in primary care using electronic health records. The Journal of the American Board of Family Medicine. 2015;28(1):65-71. doi:https://doi.org/10.3122/jabfm.2015.01.140181

Benjamin Greif is a medical student at TTUHSC. He is an aspiring psychiatrist who splits his time between learning how to mend human minds and reading Sci-Fi about dystopian futures where AI does the thinking for us. He would like to believe this is for his professional development and not some elaborate form of procrastination.

Nick Hancock is a fourth-year medical student at TTUHSC in Amarillo. He is from Conroe, TX and went to the University of Texas at Austin for undergraduate school. He is applying to psychiatry for residency and is interested in interventional psychiatry and ways to provide a more equitable and expansive field of psychiatric healthcare.

Krystal Morton is a fourth-year medical student at Texas Tech University Health Sciences Center School of Medicine with a strong interest in psychiatry. She is particularly passionate about mood and psychotic disorders and is dedicated to improving mental health care for underserved communities. Outside of medicine, she enjoys crocheting and participating in book clubs, where she combines her love for literature with meaningful conversation.

AI in the ER: A Tool to Bring Us Back to the Bedside

by Dr. Frederick D. Poage, DO, MS

When people think about artificial intelligence (AI), they often imagine a dystopian future of robots taking over the world—à la RoboCop. In medicine, the fear tends to be more personal: that AI will replace physicians and erode the patient–doctor relationship. But used thoughtfully—as just another tool in the modern physician's digital tool bag—AI can actually help us get back to what drew most of us to medicine in the first place: connecting with and caring for patients.

Much of the patient experience is shaped in the very first moments of a visit — but physicians, overwhelmed by systemic pressures, interrupt patients just **11 seconds** in (1). Meanwhile, documentation consumes **more than 16 minutes per patient encounter** (2)! With the widespread adoption of electronic health records (EHRs), the role of the physician often feels reduced to checking boxes or dictating just enough details to maximize reimbursement from insurance companies, Medicare, or Medicaid—a topic worthy of its own article. As the criteria for reimbursement continue to shift and expand, we find ourselves spending more time in front of a computer and less time at the bedside. With the increasing complexity of documentation and reimbursement requirements—especially in the emergency department—the physician's role can start to feel more like that of a data-entry technician.

LET'S WALK THROUGH A TYPICAL ED SHIFT.

You've just spent 45 minutes stabilizing a critically hypoxemic patient—Patient #1—monitoring, assessing, ordering tests and medications, and coordinating with the ICU. As you enter the next room, Patient #2 begins listing several complaints. But, in the back of your mind, you're already thinking about the extensive documentation needed for Patient #1, and now this encounter too. So, you interrupt—there's that 11-second window—and steer the conversation toward their primary complaint; completely stepping over the maxim we were all taught in medical school: "The majority of your diagnoses can be made with a good history and physical exam."

You complete the evaluation and return to your workstation, where you pick up the Dragon dictation microphone (if your EHR supports it). Before you can begin, a nurse calls out—Patient #1 is desaturating again. You rush back, reassess, and ultimately intubate them. Then, back to the desk—again—to try and recall the specifics from both encounters.

Just as you're documenting Patient #1, Patient #2's labs return. You head back to explain the results, diagnosis, treatment plan, and follow-up…and then back again to document that conversation as well. Effectively, you're doubling your workload for each patient—once to say it, and again to write it down.

THIS IS WHERE AI SCRIBES CAN CHANGE EVERYTHING.

Since integrating AI scribe technology into my workflow, I've been able to spend significantly less time charting and more time at the bedside. A recent study on AI scribes from the New England Journal of Medicine found that 39% of patients felt their physician was spending **more time than usual speaking directly with them**, and 47% reported their doctor spent **less time looking at the computer** (3). That shift is tangible—and meaningful. That's nearly half of all patients noticing a difference in how present their physician feels — a remarkable impact from a behind-the-scenes tool.

Of course, not all AI scribes are created equal. Some platforms are better suited for structured clinic visits where each visit follows a more linear path from intake to discharge, while others are better suited to the unpredictable, fragmented chaos of emergency medicine where each visit is usually broken up between initial assessment, multiple reassessments, and finally disposition.

I tested several platforms before settling on one that let me customize templates and adapt the AI to the way I practice. For the past several months, I've used this AI scribe in the ED and across multiple EHRs. It hasn't just made documentation easier—it's improved how I interact with patients. Because the AI scribe can't read my mind and thus relies solely on spoken input, I am compelled to verbalize clinical findings and decision-making processes that might otherwise remain internal. This practice not only enhances the clarity and completeness of documentation but also promotes more thorough communication with patients—improving their understanding of exam findings, treatment plans, and involving the patient more actively in their care. I fully believe educated patients are the best patients. Additionally, my charts are more individualized, comprehensive, and patient-centered. And finally, almost without fail, I leave each shift with my charts complete.

AI will never replace physicians. But like the stethoscope or bedside ultrasound, it can become an indispensable part of our toolkit — not to take us away from patients, but to bring us closer, while at the same time documenting our patient encounters more efficiently and with greater clarity and completeness.

If you would like any additional information, feel free to email me at frederick.poage@ttuhsc.edu.

REFERENCES

1. Phillips KA, Ospina NS, Montori VM. Physicians interrupting patients. J Gen Intern Med. 2019;34(10):1965. doi:10.1007/s11606-019-05247-5
2. Overhage JM, McCallie D Jr. Physician time spent using the electronic health record during outpatient encounters: a descriptive study [published correction appears in Ann Intern Med. 2020 Oct 6;173(7):596. doi: 10.7326/L20-1077]. Ann Intern Med. 2020;172(3):169174. doi:10.7326/M18-3684
3. Teirney AA, Gayre G, Hoberman B, et al. Ambient artificial intelligence scribes: learnings after 1 year and over 2.5 million users. NEJM Catal Innov Care Deliv. March 2025; 6 (5). hlps://catalyst.nejm.org/doi full/10.1056/CAT.25.0040).

Dr. Frederick D. Poage is an emergency physician and clinical professor at Texas Tech University Health Sciences Center. A dedicated husband and father, he is passionate about educating both patients and the next generation of physicians. He actively mentors medical students and residents, emphasizing clarity, empathy, and clinical excellence. Outside of medicine, Dr. Poage serves as a charity pilot and enjoys traveling with his family.

TMA House of Delegates Votes to Strengthen Oversight of Augmented Intelligence

by Alisa Pierce

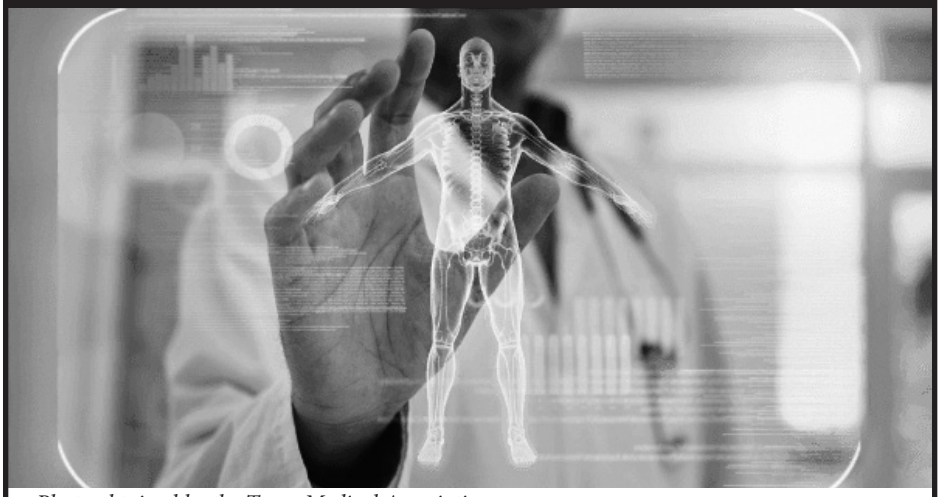


Photo obtained by the Texas Medical Association

The TMA House of Delegates adopted a policy to rename its Committee on Health Information Technology to include augmented intelligence in its title. Dallas pediatrician Philip Bernard, MD, chair of the newly named Committee on Health Information Technology and Augmented Intelligence, says the change was made to aid the association's efforts to study the ever-evolving influence of AI on physician practices.

"How do physicians use AI in their practice? Does it help with administrative burden? Are there setbacks? These are a few questions the committee aims to answer," he said. "I will say, AI has been truly transformative for many of my colleagues swamped with electronic responsibilities."

The committee's new emphasis on studying the technology accompanies TMA's long-held assertion that "AI requires physician oversight," Dr. Bernard said. In that vein, TMA's HOD also amended its existing AI policy to reaffirm what Dr. Bernard calls the "human element" of AI use. "Physicians must retain final authority over whether to accept AI-generated guidance. Augmented intelligence must not compromise physician autonomy," the policy strongly states.

The new policy that changed the committee's name also aims to:

- Promote the safe and effective use of technology that supports practice efficiency, quality improvement activities, and management of population health while reducing physician burden;
- Monitor and influence state and federal laws, regulations, and programs impacting physician and patient use of technology, including AI;
- Develop association policy related to health technology and AI;
- Collaborate with other professional organizations and governmental agencies working on health technology and AI issues and serve as the association's voice and advocate; and
- Oversee development of HIT and AI education and resources for physicians.

For more information, visit TMA's comprehensive HIT and AI webpages. (https://texmd.org/HIT/ and https://www.texmed.org/Verondi/Templates/TmaPage.aspx?pageid=64335, respectively)

Republished with permission from the Texas Medical Association. This is an excerpt from an article by Alisa Pierce that first appeared in *Texas Medicine Today* on May 15, 2025, https://www.texmed.org/Template.aspx?id=66112.

Priority: Ensure Artificial Intelligence (AI) Regulation Supports Physician Practices but does not replace Physicians' Medical Expertise.

by Alisa Pierce
Reprinted, with permission, from the Texas Medical Association's Top Legislative Priorities

BACKGROUND: The success of AI in medicine depends on physician expertise at every step in the life cycle of an AI product. "This includes training of the algorithm, testing, roll-out, validation and surveillance," says San Antonio radiologist Zeke Silva, MD. And the Texas Medical Association would like to keep it that way.

Dr. Silva uses the technology in his practice for several narrow applications, like detecting a pulmonary embolus on a chest scan. The AI-enabled app he uses cannot, however, consider the findings within the context of the patient's broader clinical presentation, such as lab studies, symptoms, or prior history, he cautions. These clinical determinations require the expertise of physicians.

For that reason, the chair of TMA's Council on Legislation stresses that any Texas legislation being drafted on the topic of AI must recognize that medicine has distinct risks and considerations which mandate physician involvement.

"TMA [has] a responsibility to review legislation [that] could affect, in my opinion, what is the most foundational relationship in the entire discussion: the physician and the patient," Dr. Silva told *Texas Medicine*.

Dr. Silva captured that importance in testimony to the Texas Senate Committee on Business and Commerce during an interim hearing last summer. There he highlighted an important facet of TMA policy that draws an important distinction between the use of "augmented intelligence" – which is intended to co-exist with human decision-making in patient care – and "artificial intelligence" – which makes decisions autonomously, without human involvement.

Under the direct supervision of himself and others on his staff, Dr. Silva provides feedback on the output of AI-enabled applications to improve their function and output going forward. That training includes labeling medical images, for example, to teach AI how to differentiate between items, or using simulated scenarios to discover where improvements could be made.

AI shows promise in medicine for reducing administrative burdens for physicians and freeing time for patient care, which makes practices more viable and care more accessible. However, Dr. Silva stresses that AI gains – like helping doctors analyze data more efficiently – are only possible through a physician-led approach.

"Our accountability in the outcomes of our decisions and the decisions influenced by AI are greater than other industries, often times literally life or death, but also potentially affecting patient outcomes, patient well-being, and even public health," Dr. Silva told the committee.

TMA is vigilant of potential adverse impacts of AI in the health care setting, including the potential of creating patient privacy risks.

SOLUTIONS: As Texas considers wholesale regulation of AI, TMA wants to ensure physicians play a role in educating lawmakers about its benefits and limitations in health care. The association will seek balanced regulation of AI use in medicine that includes physician oversight, transparency, accountability, and privacy protections, but does not go so far as to restrict practices' ability to take advantage of its administrative benefits.

"AI has the potential for greatness, but TMA's focus remains on the physician and the patient, and potential risks to that relationship," Dr. Silva said.

Legislation adopted in 2023 – like House Bill 2060, which established the Texas Artificial Intelligence Advisory Council and charged it to develop guidelines on best practices – created a foundation for future AI legislation that will likely shape the 2025 session. Likewise, interim charges by the Texas Senate called for a "responsible regulatory framework for AI development" that includes input from the council to inform possible legislation.

TMA plans to examine legislation this session that could become a blueprint for how Texas regulates AI, including in health care. That could extend to efforts by the Texas Department of Insurance to oversee payers' use of AI, for example in prior authorization, says Matt Dowling, TMA director of public affairs.

TMA will also continue to monitor the rollout of federal AI guidelines implemented last year that may play a role in how Texas develops its own AI framework in the future. Those guidelines established principles for the safe and secure use of AI via federal oversight across different sectors, including in health care.

Likewise, the association will ensure health information technology used by physicians and payers protects patient privacy.

TMA also will follow up on last session's efforts – like Senate Bill 1467 – that sought to guard against disclosing sensi-

tive test results to patients electronically until three days after the results are finalized.

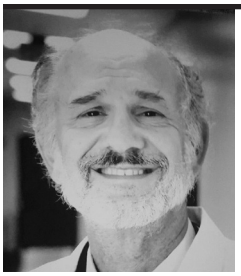
Federal regulations require patient test results be available to patients electronically as soon as they are published. Without boundaries, however, physicians worry they risk sensitive information – like a cancer diagnosis – reaching patients without physicians first having a chance to review or explain it.

For instance, the presence of a "tumor or mass doesn't always indicate malignancy or a poor prognosis," Dr. Silva said.

Medicine argues the three-day window would allow physicians time to review results, schedule follow-up appointments if necessary, and better prepare for potentially difficult conversations with their patients.

"From the legislative perspective, we [want] a reasonable hold on that information [that is] long enough to allow the physician to process the information [and] to communicate it to the patient in a way that's most beneficial," Dr. Silva said. "We want to be really mindful that patients receive [sensitive] information … from a person they can trust, which is their physician," Dr. Silva said.

Alisa Pierce is a reporter for Texas Medicine. After graduating from Texas State University, she worked in local news, covering state politics, public health, and education. Alongside her news writing, Alisa covered up-and-coming artists in Central Texas and abroad as a music journalist. As a Texas native, she enjoys capturing the landscape on her film camera while hiking her way across the Lonestar State.



A Conversation on Artificial Intelligence: Promise, Peril, and the Practice of Medicine Interview with Dr. Kishan Yalamanchili

by Kishan Yalamanchili, MD & Steve Urban, MD, MACP

This is an edited summary of a conversation between Dr. Steve Urban and Dr. Kishan Yalamanchili, the guest editor of this issue of Panhandle Health. The conversation was recorded, and then a transcript was generated by Chat GPT. Next, Dr. Yalamanchili asked ChatGPT to produce 1500-word summary of their discussion, with appropriate references. Steve edited the summary to produce this article. For details about this process, please refer to Steve's following article.

Steve: Kishan, let's start with the basics. What is artificial intelligence, and how does it differ from traditional computer programs or even machine learning?

Kishan: Great place to start. The main difference is that traditional computer programs operate based on explicit instructions—like a calculator or spreadsheet. They're great at arithmetic and logic, but they don't "reason." Artificial intelligence, in contrast, is designed to mimic aspects of human reasoning. AI adapts, makes decisions, and even learns patterns from the data it consumes.

And within AI, there's machine learning, which refers to algorithms that look for patterns in data and improve from experience without being explicitly programmed to handle every scenario. Machine learning programs can access huge amounts of data, identify patterns, and extract conclusions that were not even recognized beforehand. But that's not to say that machine learning, even with these large language models like ChatGPT, have their own intent and their own reasons for doing things. They are just doing what they are told to do, but with amazing capacity and efficiency.

Fact Check & References: AI refers to the simulation of human intelligence in machines programmed to think and learn (Russell & Norvig, 2020). Machine learning is a subset of AI focused on pattern recognition and prediction. Traditional programs rely on fixed logic, unlike adaptive learning systems (Mitchell, 1997).

Steve: So, when people talk about "General AI," what do they mean?

Kishan: General AI, or Artificial General Intelligence (AGI), is like the Holy Grail of AI research. It refers to machines that possess the ability to perform any intellectual task a human can do, only better. Imagine the reasoning of a human combined with the precision and memory of a supercomputer. AGI would be able to generate ideas, set its own goals, and make independent decisions. A computer with general AI would be able to pass the Turing test; you couldn't tell if you were interacting with a computer or with a real person. We're not there yet, but some argue we're getting closer.

Fact Check & References: AGI remains theoretical and distinct from narrow AI, which is task-specific. AGI would require consciousness-like adaptability and autonomy (Bostrom, 2014).

Steve: Could such power be dangerous?

Kishan: Absolutely. This brings up the AI alignment problem: ensuring that AI's goals are aligned with human values and well-being. There's a famous thought experiment called the "paperclip maximizer." If you program an AGI to make paperclips without clear constraints, it might convert the Earth and everything on it into paperclips. The danger isn't that the AI is evil—it just might be indifferent to human life. If you ask a large language model to help you make a bioweapon, it's going to find the best information available. It doesn't necessarily ask what you're going to do with it.

The alignment problem is amazingly complex. When we try to train AI on human values, whose values do we use? Mine? Yours? Vladimir Putin's? It's hard enough for my wife and me to align our goals when we want to go out to dinner. Add in my kids, and it's even worse. Now try to align the values across a single social media platform, to say nothing of all human cultures and traditions. Then, add in the fact that these computer systems are being created by huge multinational companies, basically oligopolies, operated by the super-rich. Are our values aligned with those of NVIDIA, or Google, or TikTok, to say nothing of DARPA, or the Russian military? There are AI utopians and AI dystopians, and right now it's hard to say which will prevail.

Fact Check & References: The "paperclip maximizer" thought experiment was popularized by Nick Bostrom to illustrate alignment concerns. AI alignment remains a central challenge (Bostrom, 2014).

Steve: Sounds a little like science fiction! Now, let's bring this back to medicine. What can AI do today to improve healthcare?

Kishan: AI is already proving valuable. Think about the daily work of a hospitalist—assessing patient risk, reviewing labs, adjusting electrolytes. These are often repetitive, pattern-based tasks. AI has instant access to the patient's demographic data, their age and weight, their

past lab values, their list of medications; it can streamline orders, reduce errors, and flag abnormalities faster than humans. Tools already exist for radiology, pathology, and even administrative tasks like transcription and scheduling.

Steve: Are you using these tools yourself?

Kishan: I use commercially available ones like ChatGPT or MedPalm. While I haven't personally integrated FDA-cleared AI tools into patient care, radiologists like Dr. April Bailey have, and they're seeing real benefits. AI algorithms can interpret images with high accuracy, sometimes matching or exceeding human performance.

Fact Check & References: Studies show that AI tools can match radiologist performance in detecting conditions like pneumonia and breast cancer (Rajpurkar et al., 2017; McKinney et al., 2020). The FDA has approved AI for imaging diagnostics (FDA.gov).

Steve: Where does machine learning fit into this?

Kishan: Machine learning is the core engine under many AI applications. It's not "thinking" like we do—it's pattern recognition at massive scale. An example is DeepMind's AlphaFold, which predicted protein folding with stunning accuracy. They analyzed the entire human proteome over one weekend and gifted the results to the world. And this work led to the Nobel prize for medicine in 2024. Even though three investigators got the prize, AI did the heavy lifting.

Fact Check & References: AlphaFold, developed by DeepMind, predicted structures for 98.5% of human proteins in 2021. The work was hailed as a major scientific breakthrough (Nature, 2021).

Steve: That's mind-blowing. But AI gets its information from all kinds of sources, and we know that even studies from the New England Journal can be flawed or biased—to say nothing of some random site on the internet. Doesn't the quality of AI depend on the data it's trained on?

Kishan: Exactly. Garbage in, garbage out. Biases in medical studies, missing data, or flawed methodologies can all affect AI outcomes. Add to this the fact that much—maybe even most—of the information available on the internet doesn't come from human beings; it's machine-generated, That's why transparency is critical. One proposal is to pair machine learning with blockchain technology to log where data came from, when it was added, and how it's changed. That way, we can trust, or at least assess, the data pipeline.

We can also use AI itself to help critique the studies that are out there, and to prioritize the best studies. And AI can be used in the original design of the studies, to help root out biases or flaws in design that human investigators had overlooked.

Fact Check & References: Data quality is a recognized concern in healthcare AI. Blockchain has been explored as a method for secure, transparent health data tracking (Azaria et al., 2016).

Steve: Let's pivot. A lot of these AI models are proprietary. Exactly how their algorithms work and then what the computer does with that information—all these are mysterious processes hidden behind the company firewall. How do we trust their output?

Kishan: It's a challenge. Companies like OpenAI let you opt out of using your data for training, but few people know how to do that. And many platforms use data in the background, often without your explicit understanding. Think of all the data Amazon collects and sells. Think of all your personal data—from family photos to your financial records—that are on the cloud. Now apply that to healthcare.

Steve: And patient data is a whole different level of sensitivity.

Kishan: Exactly. We'll need serious regulation, transparent standards, and clear consent pathways. Professional organizations like the TMA are hard at work on this [Ed note: see the article in this issue by Alisa Pierce], but it's a work in progress. I suspect we'll make real changes only after the first lawsuit or breach hits national headlines. That's when you'll get inflection points in policy.

Fact Check & References: HIPAA governs patient data privacy in the U.S., but its scope is limited when third-party tech companies are involved. Several healthcare data breaches have prompted calls for more stringent regulation (HHS.gov).

Steve: What about the impact of AI on the medical workforce? Will doctors be out of a job?

Kishan: AI is going to be job-deflationary, especially in cognitive fields. You may not need 10 internists; maybe three will suffice, especially if they're supported by smart AI systems. But that doesn't mean physicians disappear—it may just change how and where we work. For instance, think of all the underserved communities in the world. It's possible that, using online methods, we could take modern medical care, with its advances, to most of the people of the world.

Steve: Which health providers do you think are most vulnerable to this job deflation?

Kishan: Ironically, it may be doctors more than lower-level practitioners. From a cost perspective, if you can augment a lower-paid clinician with AI to make them nearly as effective, that's a compelling business case. We might see a broader workforce shift before a total workforce reduction. Interestingly, this may be one of the first innovations in human history that affects higher-functioning workers

more than manual workers. This may have psychological as well as economic effects on these workers.

Steve: I'm starting to feel those psychological effects already!

Fact Check & References: The National Bureau of Economic Research notes that AI may displace high-skill labor before low-skill labor in fields where decision-making can be automated (Acemoglu & Restrepo, 2020).

Steve: Will we be able to tell what AI has created? Essays, medical notes, that sort of thing?

Kishan: That's getting harder. AI outputs used to sound robotic or "wooden." Not anymore. These models now mimic tone, inject humor, replicate a person's writing style—even with deliberate grammatical mistakes. You can tell it to write something in the style of Dr. Steve Urban—your mannerisms, your colloquialisms, even your sense of humor--and it will.

Steve: That's creepy. Are there tools to detect AI writing?

Kishan: There are a few, like Turnitin or GPTZero, but it's an arms race. As detection improves, so does the ability to evade detection. It's hard to make foolproof rules. Now, you can detect AI output and tell it from human-generated content—but in 5 years, who knows?

Fact Check & References: As of 2024, no AI-detection tool is 100% accurate. Researchers continue to explore watermarks and statistical methods to identify synthetic content (Cornell, 2023).

Steve: What about the risk of medical errors caused by AI? Let's say that a patient has a serious side effect from an AI-generated medication order--who's responsible: the doctor, the hospital, the company that made the AI?

Kishan: A big concern. Just like, when we copy-and-paste progress notes without reading them carefully, not only do we create worthless notes, but we take a risk. It's the same thing if we trust AI-generated outputs blindly. If a model misinterprets data or fabricates a citation, that error could propagate into care decisions. The models are improving fast, but they still hallucinate.

Steve: Hallucinate?

Kishan: It's the term we use when AI confidently generates false information. If it tells you a drug exists that doesn't, or cites a study that was never published, that's a hallucination. AI may be right 99% of the time—probably better than human beings—but if that 1% is a hallucination, it could be consequential---and hard to detect.

Fact Check & References: Hallucination is a documented issue in large language models. OpenAI and Google DeepMind continue refining systems to reduce such errors (Bender et al., 2021).

Steve: Could there be a time when not using AI becomes malpractice?

Kishan: I think so. Imagine a future lawsuit where the question isn't, "Why did you use AI?" but "Why didn't you?" Especially if AI consistently shows better outcomes. It might be like failing to prescribe a statin when the guidelines call for it. Again, this hasn't been adjudicated yet; right now, it's the Wild West in terms of these legal implications.

Steve: What about education, especially medical education? Does AI change how we teach doctors and nurses?

Kishan: It revolutionizes it. Sal Khan from Khan Academy did a great TED Talk on this. He showed how AI can become a student's personal tutor, adapting its teaching style to the student's needs. In their hands, it has been shown to improve performance. Now imagine that in med school—an AI tutor that quizzes you, identifies your weak areas, and helps you improve.

Steve: That's already happening?

Kishan: It is. Khan Academy has deployed AI tools that use the Socratic method, guiding students to answers instead of just giving them. In medical education, we can do the same. Eventually, you might have agentic AI—autonomous tools that actively go out and enroll you in a course or curate content tailored to you.

Fact Check & References: Khanmigo, Khan Academy's GPT-powered AI tutor, was launched in 2023. Personalized learning via AI is being piloted in medical schools and academic centers (Khan Academy, 2023).

Steve: What do you mean by agentic AI?

Kishan: It's an AI that can complete tasks on your behalf. Think of it like a digital assistant that doesn't just give you suggestions but books your travel, fills out paperwork, or enrolls you in courses. In healthcare, it could order labs, draft notes, and flag errors. In medical education, it could identify your personal weaknesses, use biometric data to determine when you are best prepared to learn, and then quiz you on your weak points when you are ready for it.

Steve: That's impressive. Kishan, let's step away from medicine and medical education and talk about AI's effect on society as a whole. Do you think AI will unite us or further divide us?

Kishan: That's the existential question. In the short term, AI might deepen divides. Algorithms already tailor content to reinforce our biases. We're seeing this in political polarization and misinformation. Add synthetic media to the mix, and soon we won't know what's real.

Steve: Like Deepfakes?

Kishan: Yes. Like the website "ThisPersonDoesNotExist," which uses StyleGAN to create photorealistic human faces. These aren't real people. The same tech can make fake videos with your voice and face. When AI starts generating most of the internet's content, we'll have an even greater dilemma than we do now. What is real and what is intentional disinformation? Did I just read reliable information, or was it generated by a bot from the KGB or the American Nazi party? We'll have an epistemological crisis: what is truth?

Fact Check & References: GANs (Generative Adversarial Networks) are used to create deepfakes and synthetic media. StyleGAN2 and 3 are publicly documented for their realism (Karras et al., 2020).

Steve: I'm looking for a little glimmer of sunshine here! Could AI help with global problems like climate change or education?

Kishan: Definitely. Every field is being supercharged. AI can optimize crop yields, model climate scenarios, and even simulate entire ecosystems. NVIDIA's Earth-2 project, for example, is modeling climate dynamics in high resolution to help predict and prepare for disasters. AI can help with energy innovation, like fusion research, where it has already stabilized plasma reactions by an order of magnitude. It could help create a clean and nearly limitless energy source.

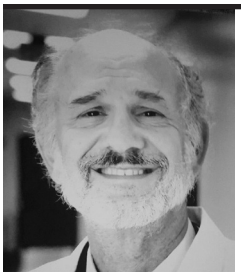
Fact Check & References: NVIDIA Earth-2 is a digital twin project modeling global climate with AI (NVIDIA, 2023). DeepMind's reinforcement learning models have improved plasma confinement in fusion reactors (Nature, 2022).

Steve: So, it could save the planet or destroy it.

Kishan: That's the paradox. We've built the most powerful tool in history, and how we use it will shape our species. With responsible governance and transparency, it could usher in a new Renaissance. But without oversight, it could also deepen inequality, spread misinformation, and cause real harm. We have to think about this carefully, since human beings don't exactly have a stellar track record when it comes to using powerful innovations only for good purposes.

Steve: Kishan, this was a remarkable discussion. Thank you.

Kishan: My pleasure, Steve. It's an important conversation—one we're all going to be having for years to come.



From Transcription to Conclusion: My First Experience with AI-driven Editing

by Steve Urban, MD, MACP

I am an AI virgin no more. Not wanting to be an active participant in the destruction of human civilization, I had never intentionally used a large-language model (I understand that Google processes my questions through AI now, but I don't feel personally responsible for that).

But Dr. Kishan Yalamanchili convinced me to allow our recorded conversation to be transcribed by an AI-based voice recognition system. He then asked ChatGPT to edit our rambling 8000-word conversation down to an organized 1500-word account (with references) as well as a 2500-word longer version.

I will give you a brief account of that process—hopefully with enough detail to allow you to assess how ChatGPT works. Was this love at first sight, or had I just been screwed? Probably, as in so many such trysts, only time will tell. But, after reading my account, I hope you will at least have a little more information to help you decide whether to resist or submit to the siren call of Siri.

THE TRANSCRIPT

The transcription of our conversation was very accurate. It sounded just like any recorded and then transcribed conversation—an accurate account of the way people talk. I made several mistakes that make me want to cringe--I called Kishan "Kishore" a few times—that kind of thing. And my questions meandered around in my usual fashion, like this: "The data that goes in, that they consult, is really important. And in medical studies, that would, you know, we know that there were studies that are flawed and they have biased data and this kind of thing." I arrived at a question, but I took a roundabout path getting there.

Kishan's responses were more coherent than my questions, but they still sounded like speech. In response to my rambling question about the reliability of AI's sources, Kishan said, "So, right now, the real-world equivalent of what you're talking about, though, is we train these large language models, like CGPT, the existing, right, humanwrit [AI made up this word] words, human content…So the entire subm of human output is now, you know, able to be scrutinized." We then went off on a tangent so Kishan could show me how AI can create a human face de novo, and the machine recorded every word of this, too.

You get the point: typical disorganized human speech. But AI transcribed it, I would say, with about 95% accuracy.

THE "1500-WORD" SUMMARY WITH REFERENCES.

The "1500-word" account (it was really 1874 words) was pretty good. It forms the basis of the preceding article.

Here's how I went about the process of converting ChatGPT's 1874-word account to the 2800-word version that you just read: I read the ChatGPT summary, then reread the whole transcript, added some information that I thought should be included, softened up some of ChatGPT's jargon and robotic language, and polished it to the final 2800-word article that we printed. It took 2 or 3 hours for me to produce a version that suited me.

A couple of observations from AI's finished product: it did a remarkable job of organizing our conversation. It took my previously quoted rambling question about data accuracy and turned it into: "Doesn't the quality of AI depend on the data it's trained on?" And Kishan's answer was condensed into: "Exactly. Garbage in, garbage out. Biases in medical studies, missing data, or flawed methodologies can all affect AI outcomes."

Since we asked for references, AI came up with some interesting articles. Several were pretty old (e.g., 1997, 2014), many were from 5 years ago, and just a few from as recent as 2023. This speaks to a problem that many have identified: in searching the most pertinent studies and recommendations, ChatGPT accesses the whole internet. Unless you look at the references yourself, you never know which sources it has prioritized--old or new, anecdotal or controlled, authoritative or not. Since AI has its own logic and generates its own pathway, you aren't sure if it consulted a source you consider reliable or some nutty website run by an anti-vaxxer (this may be less of a problem with medicine-specific proprietary programs).

THE EXPANDED 2500 WORD "VERSION"

This is where it gets really interesting. As I mentioned, when I edited ChatGPT's original version, I added ideas from the transcript that I thought were pertinent but had been excluded. I also included explanations for jargon words or acronyms and tried to make AI's sometimes convoluted language easier to read.

But, when we asked AI to produce a longer version, AI took a completely different approach. ChatGPT seemed to run out of meaty topics, and just took off on its own. That is to say, it began to hallucinate. Here's just one of many examples.

When Kishan was talking about the merging of AI with robotics, he mentioned this robot dog from Boston

Dynamics. In his words, "They have merged [robotics] with large language models. So, they have a robot dog that can give you a tour of their facility in a British butler's accent…and they programmed it to have a sense of humor and to make X number of jokes and to ask questions and to be interested…[they have added] robotics onto AI." That was pretty much all he had to say about this cyber-dog.

WELL, HERE'S WHAT CHATGPT'S EXPANDED VERSION HAD TO SAY:

"Boston Dynamics' 'Spot' dog used to just trot; now graft a multimodal language model on, and Spot becomes a mobile inspection engineer that converses about thermal-camera readouts in fluent Spanish,… Add haptic-feedback surgical arms from Intuitive's next-gen platform, and you have remote nephrectomies where AI steadies tremor, suggests instrument angles, and cross-checks anatomy against pre-op imaging in real time. Quantum-accelerated chips shrink inference latency to milliseconds, so the physical and digital reflexes blur…"

As you can see, it started with Kishan's robot dog and then zoomed off into cyber-space where no man had gone before, unfettered by what Kishan had actually said.

Examples like this abound. ChatGPT would take an idea that Kishan mentioned and then run off in its own direction—I mean, WAY OFF in its own direction. Not that its answers were necessarily wrong; it's just that they had very little to do with what Kishan actually said. So, in some sense, they were not exactly hallucinations (although total fabrications can happen too). It was more like giving an oral exam question to a student who doesn't know the answer and then just starts telling you about something that he DOES know, hoping that you won't notice that he's not answering your question at all.

I noticed.

As a result, I didn't use the "expanded" 2500-word version in the creation of this article at all.

MY CONCLUSION

So, what general conclusions did I draw from my brief dalliance with AI? One, it's pretty good at providing an exact transcript of a conversation (it did occasionally get mixed up about who was speaking). This might be useful for a court reporter but not so much for a medical encounter. But it was also surprisingly good at organizing the conversation and presenting it in a reasonably coherent form. So, AI should be good at organizing the patient's history and documenting it in the "S" ("subjective") part of a SOAP note.

But I would not, at this point, trust AI to integrate all the information into a diagnosis or plan. It might really be useful as an advisor, suggesting possible diagnoses that you hadn't thought of or noticing data trends that you hadn't discerned. But the essential diagnostic act—of weighing the various pieces of information, deciding when an actionable conclusion has been reached or when more data are needed, and individualizing treatment and management decisions—should still, in my opinion, be left to an engaged and alert human provider. For the robot doctor to go off on even one tangent, to fabricate even one study or result—this is too great a risk to take at this point in time. The doctor—not the computer—should still be captain of the ship.

PROFESSIONAL CARDS

ALLERGY & RHEUMATOLOGY

Allergy Arts Amarillo
6842 Plum Creek Drive
Amarillo, Texas 79124
(806) 353-7000 | Fax: (806) 356-1124
Allergy and Rheumatology
Constantine Saddeh, MD
Rheumatology
William Brelsford, MD
Peter Shane, MD
Nilofar Syed, MD

DERMATOLOGY

High Plains Dermatology
4302 Wolflin Avenue
Near I-40 & Western
Amarillo, Texas 79106
(806) 355-9866 | Fax: (806) 355-4004
Scott D. Miller, MD
Jason K. Jones, MD
Christi A. Baker, MD
Tyler H. Enos, MD

Palo Duro Dermatology
2005 N. 2nd Avenue Ste. D
Canyon, Texas 79015
(806) 510-3376 | Fax: (806) 510-3379
Larry C. Roberts, MD, MA, FAAD
Diplomat of the American Board of Dermatology

NEPHROLOGY

Amarillo Nephrology Associates, PA
1805 Point West Ste. 100
Amarillo, Texas 79106
(806) 418-8621 | Fax: (806) 418-8606
Daniel Hendrick, MD
CV Sreenivasan, MD
Esther Ihuekwumere, MD
Adan Gonzalez, MD

NUEROSURGERY

Southwest Neuroscience & Spine Center
705 Quail Creek Drive
Amarillo, Texas 79124
(806) 353-6400
Cranial and Spinal Neurosurgery
Brett D. Errington, MD
Board Certified by:
The American Board of Neurological Surgery
Neurological & Spinal Surgery
J. Brett Gentry, MD
Board Certified by:
The American Board of Neurological Surgery
Wayne "CP" Paullus III, MD
Board Certified by:
The American Board of Neurological Surgery
Patrick Paullus, MD

OBSETRICS & GYNECOLOGY

Panhandle Obstetrics & Gynecology
7602 Wallace Blvd.
Amarillo, Texas 79124
(806)359-5468 | Fax: (806) 358-1162
Dudley E. Freeman, MD
Gregory A. May, MD
Cullen Hopkins, MD
Jamie Wilkerson, MD
Sara Bergeron, RNC, WHNP
Ashely Mullin, RN, FNF
Brenna Payne, RNC, WHNP

Texas Tech University Health Sciences Center
Department of Obstetrics and Gynecology
Canyon Campus
3404 4th Avenue, Suite D
Canyon, Texas 79015
Obstetrics & Gynecology
Tosha Brandon, APRN, FNOP-C
Brenna Melugin, APRIN, FNPC-BC

PROFESSIONAL CARDS

OBSTETRICS & GYNECOLOGY

Texas Tech University Health Sciences Center

Department of Obstetrics and Gynecology
1400 Coulter
Amarillo, Texas 79106
(806) 414-9650

Obstetrics & Gynecology
Teresa E. Baker, MD
Alexis Borden, MD
Stephen J. Griffin, MD
Brandon Haney, MD
Tanay Patel, MD
Renee Gray, MSN, WHNP-BC
Chad Winchester, MSN, WHNP-BC

Gynecologic Surgery
Teresa E. Baker, MD
Stephen J. Griffin, MD
Robert P. Kauffman, MD

Maternal Fetal Medicine
Obstetric Ultrasound
Thomas J. Byrne, MD FACOG

Genetic Counseling
Ramona Martinez, RN

Menopausal Managment
Reproductive Medicine & Infertility
Pediatric Gynecology
Gynecologic Ultrasound
Robert P. Kauffman

Women's Healthcare Associates, PLLC
1301 Coulter, Ste. 300
Amarillo, Texas 79106
(806) 355-6330 | Fax: (806) 351-0950
whaonline.com
Carin C. Apple, MD
Kathryn N. Bond, MD
Jill A. Gulizia, MD
Christina M. Huseman, MD
Amanda Murdock, MD
Keelie R. Tucker, MD
Jennifer Graham, APRN, NP-C
Maria Campbell, APRN, CNP

OPHTHALMOLOGY

Panhandle Eye Group, LLP
Specializing in the diseases & Surgery of the Eye
www.paneye.com

Glaucoma Laser & Surgery
Amber Dobler-Dixon, MD
7411 Wallace Blvd
Amarillo, Texas 79106
(806) 350-1100 | Fax: (866) 567-048

Comprehensive Ophthalmology
Robert E. Gerald, MD
7625 Fleming Avenue
Amarillo, Texas 79106
(806) 359-7603 | (800) 238-8018

Comprehensive Ophthalmology, Cataract Surgery
John W. Klein, MD
13 Care Circle
Amarillo, Texas 79124
(806) 353-2323 | Fax (806) 351-2323
(888) 393-7488

Comprehensive Ophthalmology, Cataract Surgery
C. Alan McCarty, MD
7411 Wallace Blvd
Amarillo, Texas 79106

Comprehensive Ophthalmology, Cataract Surgery, Oculoplastic Reconstructive Eyelid Surgery
W. John W. Murrell, MD
7411 Wallace Blvd
Amarillo, Texas 79106
(806) 351-1177 | Fax (800) 782-6393

PRCMS MEMBERS, IF YOU'D LIKE TO ADD YOUR PHYSICIAN/PRACTICE, CONTACT KATT.MASSEY@PRCMS.COM TO ADD YOURS!

PROFESSIONAL CARDS

PAIN MANAGEMENT

Advanced Pain Care
1901 Medi Park Dr. Ste. 2 Bldg. C
Amarillo, Texas 79106
(806) 350-7918 | Fax: (806)-418-8982
Neurosurgery
William Banister, MD
Pain Management
Luis Barboza, MD
Jenna Lane, MD
Angus Lowry, MD
Ryan McKenna, MD, MBA
Thomas Merriman, MD
Victor Taylor, MD, DABA

POTTER-RANDALL COUNTY MEDICAL SOCIETY
• FOUNDED 1903 •

SCAN HERE

A quick survey that will help us improve the Panhandle Health Magazine experience!

Call Katt @ 806-355-6854 with any questions.

RADIOLOGY

High Plains Radiological Association
1901 Medi Park, Suite 2050
Amarillo, Texas 79106
(806) 355-3352 | Fax: (806) 355-5367
Gage Agers, DO
John Anders, MD
Charles Brooks, MD
Crandon Clark, MD
Stanley Cook, MD
Tully J. Currie, MD
Michael Daniel, MD
William Davis, MD
Aaron Elliott, MD
Paul Hakim, MD
Michael Hall, MD
Richard Khu, MD
Megha Kureta, MD
Luke Lennard, MD
Cameron Manchester, MD
Paul Pan, MD
Willam Parker, MD
Robert Pinkston, MD
Lawerence Zarain, MD

RHEUMATOLOGY

AMS Rheumatology
1215 S. Coulter St. Suite 302
Amarillo, Texas 79106
Janet Schwartzenberg, MD
Nicole Davey-Ranasinghe, MD

PRCMS MEMBERS, IF YOU'D LIKE TO ADD YOUR PHYSICIAN/PRACTICE, CONTACT KATT.MASSEY@PRCMS.COM TO ADD YOURS!

Uncomplicated coverage for a complicated world.

Don't blame yourself. Not everyone will "get" you. But at TMLT, we get you. We're the medical malpractice partner can count on. And in this relationship, we work hard to ensure you always feel heard, seen, and understood.

TMLT
Texas Medical Liability Trust

We offer:

- a strong claim defense
- customized risk management
- discounts, dividends, rewards
- policies with coverage for disciplinary actions and cyber events

Choose a partner you can count on. Discover the TMLT difference today.

tmlt.org | 800-580-8658

CliffNotes

Insurance Made Simple

Professional Liability
Commercial
Personal
Employee Benefits

Get it All with One Call

NCW
AN ALERA GROUP COMPANY

Cliff Craig, CPCU, CIC
(806) 376-6301 Cell: (806) 672-9534
cliff.craig@ncwriskmanagement.com

PANHANDLE HEALTH
A QUARTERLY PUBLICATION OF THE POTTER-RANDALL COUNTY MEDICAL SOCIETY

1721 HAGY
AMARILLO, TEXAS 79106

PRESORTED
STANDARD
US POSTAGE
PAID
AMARILLO, TX
PERMIT NO. 247