

JOINT *Matters*



Reimagining Arthritis Care With Digital Dialogue

In 1978, Stanford University released its pioneering “therapy advisory expert system,” called MYCIN, designed to give physicians advice on treating patients with serious infections based on an inference engine algorithm. The infancy of computer hardware during this time, among other factors, significantly limited the use of early artificial intelligence (AI) systems in health care. However, this foundational program made a compelling case for the utility of AI in medicine and set the stage for the transformative role that learning-based computer systems would play in the future.

Today, computer hardware has expanded far beyond what was previously available, and AI-powered large language models have seamlessly integrated into daily life. Medicine, like other fields, has begun to embrace the potential use of large language models in clinical workflows, reimagining how medicine is practiced. ChatGPT and its most recent avatar,

GPT-5, can be fed vast amounts of publicly available data, including biomedical literature from sources like PubMed Central, and can respond to clinical, research and educational queries with surprising fluency and relevance.

Further, more specialized AI tools for physicians, like OpenEvidence and Perplexity AI, boast impressive data scale and computational resources, enabling them to rapidly synthesize, summarize and generate text across multiple domains. For example, when interrogated about the American College of Rheumatology’s guidelines for rheumatoid arthritis in a patient with a recent breast cancer diagnosis, these large language models can summarize treatment options, compare the efficacy and safety of different drugs, and even provide patient-friendly explanations of potential side effects within seconds.

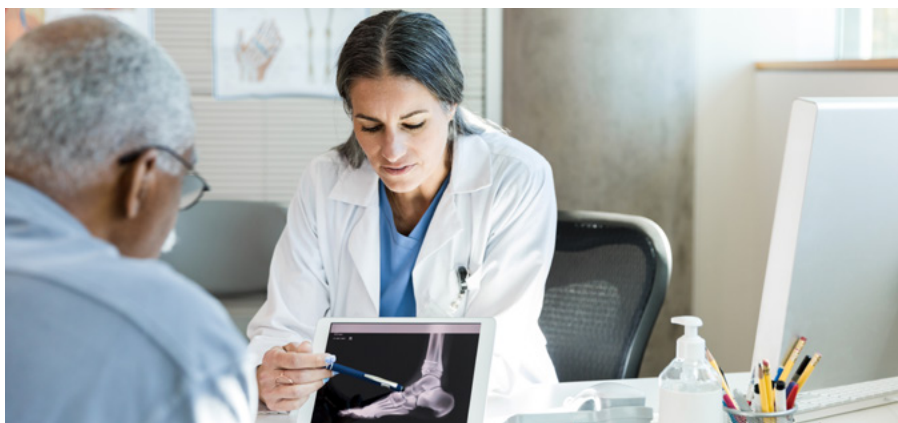
FEATURED IN THIS STORY:



Bella Mehta, MD, MS
Hospital for Special Surgery

It is evident that AI tools can assist clinicians in decision-making, help patients better understand their conditions and streamline administrative tasks — ultimately improving both care quality and efficiency. They can also serve in several realms related to care and research, such as:

- **Reducing administrative burden:** By drafting letters, billing notes and documentation, insurance appeals and tailored patient-education materials
- **Patient support:** By creating personalized resources for home exercise, nutrition advice and self-management strategies, which are key in chronic diseases like arthritis
- **Medical education:** By generating questions and structured learning materials for trainees, adapting per skill progression
- **Research applications:** By interpreting massive gene lists to identify novel drug targets, assimilating qualitative data, generating hypotheses, writing and formatting protocols and even drafting grant applications



In a recently published [study](#), our group demonstrated that ChatGPT can be utilized to analyze qualitative interview data from patients, identify key themes within the interviews and even design surveys. This approach significantly accelerates the research process. Similarly, we are now using large language models to extract patient-reported outcome measures from clinical notes, streamlining data capture for arthritis studies.

Beyond text processing and interpretation, multimodal large language models are being developed that can analyze a mix of information, such as clinical notes, patient-reported outcome measures, lab results and even radiographs. For arthritis care, these systems could consolidate all this data in one place to help guide clinical decisions more effectively, ultimately leading to improved patient outcomes.

Becoming Better Users: Prompt Engineering

Despite its tremendous scope, the usefulness of large language models is very dependent on prompt engineering. A well-crafted prompt can mean the difference between a vague answer and a clinically useful one. For example, asking a large

ADVOCACY UPDATE

Advocacy Summit

The Arthritis Foundation Advocacy Summit successfully took place Sept. 28-30 in Washington, D.C. Over 100 Advocates from 30 different states attended and received a full day of programming and breakout sessions before heading to Capitol Hill to meet with legislators. The summit is the Foundation's hallmark advocacy event and one of the most effective ways of getting Advocates at all levels more involved with advocacy programming, state committees and the [Ambassador Program](#).

The Foundation is pleased to announce the reintroduction of the [Safe Step Act](#), which would place commonsense guardrails around the practice of step therapy. At the Advocacy Summit, the advocacy team was joined by over 220 patient and provider groups supporting the bills introduced by Sens. Lisa Murkowski and Maggie Hassan in the Senate and Reps. Rick Allen and Lucy McBath in the House.

One of our top priorities for the fall is getting PBM (pharmacy benefit manager) reform passed through Congress. During the Advocacy Summit, the Arthritis Foundation joined 13 other patient organizations in a [letter](#) to congressional leadership urging the passage of a PBM reform package.

ACR, Arthritis Foundation Urge Health Care Access

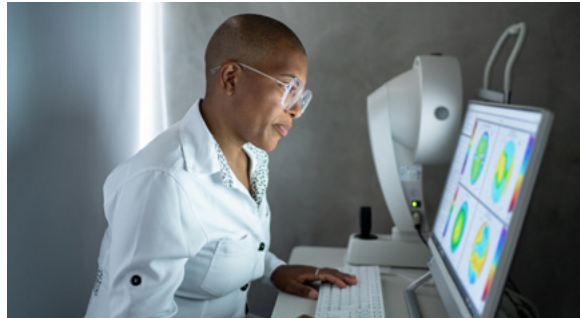
Expressing concern about the Florida Surgeon General's announcement about ending school vaccine mandates, the Arthritis Foundation published a [statement](#) with the America College of Rheumatology urging lawmakers to ensure access to health care, and will continue updating an [FAQ](#) to help patients navigate vaccine access.

Are you ready to make a difference? Take the first step by visiting the [Arthritis Foundation's Action Center](#). There, you can find a topic that resonates with you and start advocating for change.

language model to “summarize patient outcomes in bullet points suitable for an insurance application” is far more effective than a generic request for “a summary.” It is also important to note that powerful, large language models are prone to producing confident but incorrect responses, or “hallucinations” in common parlance. However, simple safeguards can reduce this risk, including:

- Providing context in the prompt
- Using retrieval-augmented generation, which integrates trusted external medical databases to ground LLM responses
- ALWAYS verifying outputs before applying them clinically

In summary, there remains significant undiscovered potential for large language models in enhancing clinical workflows, biomedical research and personalized patient care. However, as with any new tool, ethical issues — particularly those related to privacy and bias — must be



carefully addressed. With an overreliance on these AI tools, there is a significant risk of under-skilling, as trainees may never acquire the necessary skills. Clinicians who understand how to use large language models responsibly and are aware that patients are already interacting with AI tools will be best positioned to optimize care and utilize large language models in the evolving landscape of AI-assisted arthritis management.

The Arthritis Foundation would like to thank Bella Mehta, MD, MS, from Hospital for Special Surgery, for the guest editorial.

GLOSSARY

Generative AI: A type of AI that can create new content — such as text, images, music or video — by learning patterns from existing data. Examples include ChatGPT for text, DALL·E for images and Suno for music.

Large Language Models: An AI system trained in vast amounts of text to understand and generate human-like language. Examples include ChatGPT and Google Gemini.

OpenEvidence: An AI tool that finds, summarizes and explains medical research and clinical guidelines to support learning and decision-making. For example, it can turn a long research paper into clear key points for doctors or students.

Perplexity AI: A search and answer tool that combines AI with web search to give clear, sourced responses to user questions. For example, for a query on new treatments for rheumatoid arthritis, Perplexity AI will pull information from recent medical articles and cite the sources.

Multimodal Large Language Model: An AI system trained to understand and generate information from multiple types of input — such as text, images or audio — rather than text alone.

Hallucinations: Mistakes where a model confidently gives false or made-up information that looks correct.

Retrieval-Augmented Generation (RAG): An AI approach that improves answers by first retrieving information from trusted sources and then generating a response using that information. For example, a RAG system might search research papers before writing its answer.

Prompt Engineering: Carefully wording instructions to guide AI toward accurate, useful answers.

Harnessing Artificial Intelligence to Predict RA

Precision medicine for [rheumatoid arthritis \(RA\)](#) is still in its early stages. Recognizing its benefit for patients, the Arthritis Foundation has awarded a [Rheumatoid Arthritis Research Program](#) award to Fan Zhang, PhD, assistant professor at the University of Colorado Anschutz Medical Campus. This funding will support her research into developing artificial intelligence tools for predicting RA onset and potentially therapeutic targets for precision medicine.

“Currently, there are no robust predictors for when a patient will start showing noticeable clinical signs of rheumatoid arthritis,” says Zhang. “Artificial intelligence has the potential to transform the field of disease prediction. My team will develop machine learning tools that combine a wide range of patient data to produce the best prediction strategy for disease onset and novel clinical targets for intervention.”

Before the characteristic clinical symptoms of rheumatoid arthritis appear, such as joint pain and swelling, patients often exhibit immunological abnormalities. These include the production of autoantibodies like anti-citrullinated protein antibodies (ACPA) and rheumatoid factor (RF), which can be [detected through blood tests](#). However, the duration of the preclinical phase of RA varies widely among patients, and not all individuals progress to full disease. This complexity of RA’s natural history presents a significant hurdle for early interventional strategies for preventing disease progression.

Therefore, there is a pressing need to identify accurate biomarkers that can serve as indicators of future disease. To address this challenge, Zhang and her team will use their expertise in computational artificial intelligence to develop algorithms that can identify predictive biomarkers within large and complex data sets, including single-cell transcriptomics and proteomics. Specifically, the [Zhang Lab](#) will employ artificial intelligence tools to analyze RNA profiles and protein expression patterns, among other data, in individual immune cells obtained from participants in the NIH-funded [StopRA clinical trial](#).

By comparing individuals who progress to RA with those who remain disease-free, this longitudinal, data-driven, systematic approach can potentially uncover key molecular signatures, forecasting changes in the immune system that are crucial for the transition from preclinical to clinical RA. Furthermore, this research can also open doors to identifying novel targets for treatment.

“The funding from the Arthritis Foundation is a tremendous encouragement,” says Zhang. “We are very excited to push the boundaries of artificial intelligence-driven research and develop computational tools that will provide deeper insights into the evolution of rheumatoid arthritis and other autoimmune diseases.”

Zhang added that the funding also strengthens her collaboration with leading rheumatologist Kevin Deane, MD, PhD, also at Anschutz Medical Campus, who is the principal investigator of the StopRA trial and oversees the preclinical rheumatoid arthritis cohorts in the clinical study.

FEATURED IN THIS STORY:



Fan Zhang, PhD
University of Colorado
Anschutz Medical Campus



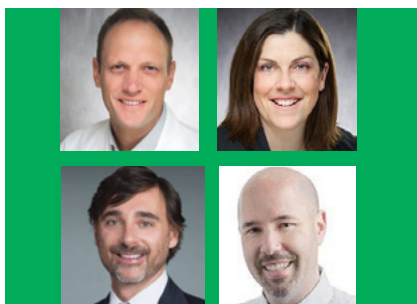
Announcements



AOFAS and the Arthritis Foundation Launch Training Program to Advance Ankle Arthritis Care

In honor of Arthritis Awareness Month in May, the [American Orthopaedic Foot & Ankle Society \(AOFAS\)](#) and the [Arthritis Foundation](#) are proud to announce the first cohort of participants for the Foot and Ankle Arthritis Development Program. This new initiative offers medical students and residents a unique opportunity to gain advanced training, mentoring and exposure to foot and ankle arthritis care. [Read the full article.](#)

AOFAS has also committed to contribute \$375,000 toward the Foundation's grant funding program focused on ankle arthritis in 2026.



FastOA Initiative, 2025 HipOA awards

There is a critical need to identify people at risk of accelerated development of hip osteoarthritis (OA) who can be closely monitored over the course of clinical studies. To support this effort, the Arthritis Foundation has awarded three HipOA awards totaling \$750,000 over two years. This year's awardees are Jessica Goetz, PhD, together with Michael Willey, MD, from the University of Iowa; Riccardo Lattanzi, PhD, from New York University; and Richard Souza, PhD, PT, from the University of California, San Francisco. [Read the full article.](#)

Leading the Way in Ease of UseSM Design

The Arthritis Foundation's [Ease of Use program](#) certifies products and packages that have been independently tested and are proven easier to use for people with arthritis and anyone else.

As the Foundation champions life-changing resources for people living with arthritis and chronic pain, we collaborate with both consumer and health care companies to design and bring products and packages to market that are easier to use.

In the consumer arena, we have certified items as small as a tube of mascara or lipstick, to larger items like bed sheets designed to be easier to tuck when making a bed. In the health care arena, certifications range from medical devices to bottles and caps and even pills with indentations, making them easier to pick up and hold.

Companies that are bringing accessible design into their design process are innovatively thinking about many areas — weight, linear force, rotational force, action fatigue, joint placement, grip span and sharp edges, and whether tools, such as scissors, are required to open packaging. These considerations are important when thinking about how they impact someone's day-to-day activities.

Ease of Use-certified products are available in retail stores and online. Certified medical devices, bottles and caps associated with various treatments are available through prescription. [See products and packaging with Ease of Use certification.](#)

Partners for Patients

As a health care provider, you're invited to join Partners for Patients, a program that connects you with patient education resources and a supportive community through the Arthritis Foundation to help improve patient care and outcomes. By becoming a partner, you'll gain access to tools that connect your patients with vital Arthritis Foundation services and support, fostering stronger collaboration and better results. Once you join, we'll highlight our partnership with you in both patient and medical communities and keep you informed with the latest updates and advancements in arthritis research and care. [Learn more about the Partners for Patients program.](#)



Arthritis Foundation Request for Proposals



2025 Clinical Rheumatology Fellowships

The 2025 Clinical Rheumatology Fellowship Request for Proposals (RFP) seeks applications from institutions with training programs in clinical rheumatology to meet the challenges of the rheumatology workforce shortage. Of particular interest are innovative approaches in training to prepare the next generation of rheumatologists to meet the evolving needs of the arthritis community. For 2025, a letter of intent (LOI) is the first step in the application process.

The due date for the letter of intent is Tuesday, Nov. 4, 2025, by 2:00 p.m. ET. Full applications are due on Thursday, Dec. 11, 2025, by 2:00 p.m. ET.

For questions about the RFP, email AFscience@arthritis.org.

Meetings and Symposia



Community Health & Workforce Summit, virtual, Nov. 14, 2025

The Community Health & Workforce Summit will highlight its commitment to growing the rheumatology workforce and improving patient outcomes, as well as to providing patient education, advocacy and building connections. Arthritis Foundation grantees will present their work on cultivating a health care workforce to serve all people with arthritis. The Arthritis Foundation extends an invitation to health care professionals and other experts in community health and workforce to join the summit. [Register for the summit.](#)



Arthritis Foundation Inflammatory Arthritis Research Summit, Hospital for Special Surgery, New York, 8 a.m. ET, Feb. 20, to 2 p.m. ET, Feb. 21, 2026

Join the Arthritis Foundation for the 2026 Inflammatory Arthritis Research Summit. The summit will bring together leading clinical, basic and translational researchers to share cutting-edge research and explore next generation approaches to care for individuals with inflammatory forms of arthritis. The summit will include opportunities for attendees to:

- Discuss the newest research in inflammatory arthritis
- Hear updates from recent Arthritis Foundation-funded researchers
- Network with leading researchers in the field
- Attend and present their research at a poster session reception

[Register for the Summit.](#)

COMMUNITY IN ACTION

Make an impact! Join the Arthritis Foundation's signature events happening at a location near you.

Carolina Hills Classic Bike Tour is a fully appointed and e-bike-friendly road cycling adventure in the foothills of the unmatched beauty of the Blue Ridge Mountains. Fundraising from this event fuels Arthritis Foundation advocacy, scientific research and life-changing programs. Explore the quiet, winding roads, vibrant art scene and welcoming hospitality of this premier Southeastern cycling destination.

Ride Your Way With Arthritis Cycling Experience allows you to participate in our signature cycling events virtually if you are unable to attend in person.

Jingle Bell Run is the most festive holiday run for a reason. Join us as we support the nearly 60 million people in the U.S. living with arthritis. You and your hospital or practice can get involved in so many ways! Register your hospital, practice or department as a team (and encourage your patients to join). You don't want to miss out!

Galas and Gatherings include local fundraising galas, golf outings, car shows or themed parties. These fun-filled events offer a festive way to help the Arthritis Foundation and benefit our entire community.

To learn more about our events and to participate, [visit arthritis.org/events](https://www.arthritis.org/events).

LET'S CONNECT!

To ensure you are receiving our most up-to-date communication from *Joint Matters*, [please visit our website](https://www.arthritis.org) to confirm your subscription.

You can also email us at afscience@arthritis.org for queries and to unsubscribe from *Joint Matters*.



Educational Resources for Your Patients

Live Yes! Connect Groups

Connect Groups provide supportive social connections and are open to parents/guardians of children with rheumatic diseases and to adults living with any type of arthritis or rheumatic diseases. These virtual and in-person groups bring people together for fun social and informative educational events and activities focused on mutual support and positive coping strategies for living well. [Find a Connect Group](https://www.arthritis.org).

Chronic Pain & Military Families, Nov. 6, 7:00 – 8:15 p.m. ET

In this free webinar, you will learn how military service and veteran status can impact arthritis, and how arthritis affects the whole family. Risk factors, common types, early diagnosis, treatment options and pain management strategies tailored to veterans' and service members' needs will be discussed. [Register for the event](https://www.arthritis.org).

Balancing Act: Caregiving & Arthritis, Dec. 18, 7:00 – 8:15 p.m. ET

If you're caring for someone with arthritis, this free webinar will provide valuable advice on managing your own health and well-being. You will learn about self-care techniques, stress management strategies and resources available to caregivers. [Register for the event](https://www.arthritis.org).