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Crossroads

With Dr. Richard Merkin

Crossroads is the unique perspective of Richard Merkin, M.D., as Innovation, Technology, Legislation and Care Delivery come together to impact the future of population health

From Early Detection to AI Integration

In this issue of *Touchpoints*, we explore the accelerating convergence of data science and clinical insight across modern healthcare, from molecular-level diagnostics to everyday clinical practice. This evolution is redefining how disease is detected, monitored and managed across the care continuum.

A Caltech researcher prepares fingernail samples for isotopic analysis, part of ongoing research exploring how chemical signatures in the body may reveal insights into human health and disease.

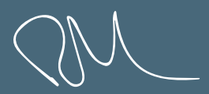
At the California Institute of Technology (Caltech), groundbreaking work is reshaping how we understand the body's earliest biological signals. Subtle elemental changes captured in fingernails may offer a time-resolved window into human health and disease, pointing to new ways we can observe what is happening beneath the surface over time.

Across our affiliate network, parallel advancements are reshaping clinical workflows. Tools such as medical scribes and ambient AI technologies are reducing documentation burden, improving accuracy and enabling physicians to reallocate time toward direct patient engagement.

Together, these efforts reflect a shared direction in care: earlier detection, greater precision and a more continuous view of the patient journey.

The future of healthcare lies in the seamless integration of innovation, technology and care delivery systems that enable physicians to see farther upstream in disease progression and intervene sooner, improving outcomes across populations.

From advances in molecular diagnostics to AI-enabled care delivery, this issue reflects a healthcare system increasingly shaped by continuous data, expanding scientific insight and a more proactive approach to how care is delivered and experienced.

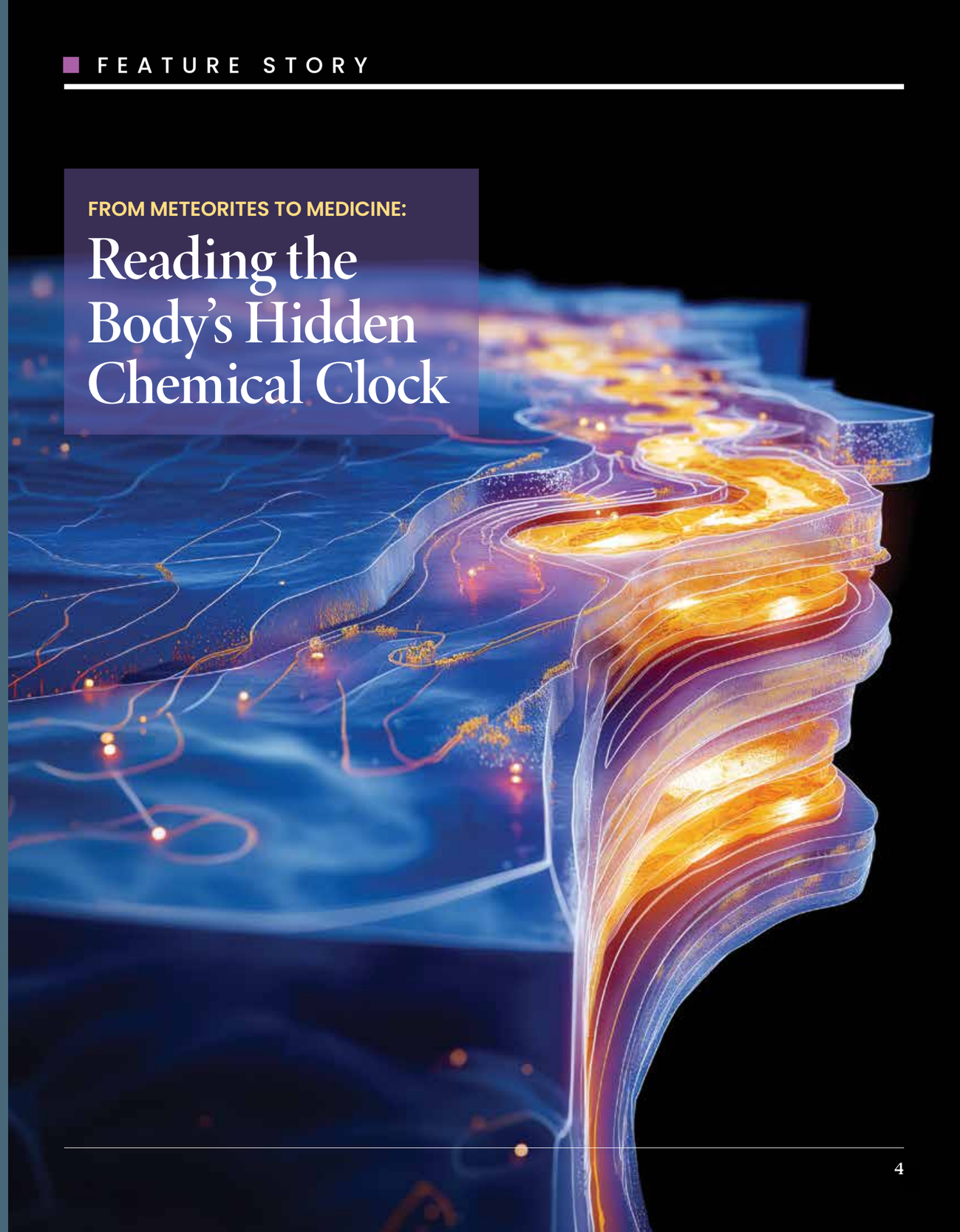


Richard Merkin, M.D.
President and CEO
Heritage Provider Network

Richard Merkin, M.D.
Healthcare visionary Richard Merkin, M.D., has spent more than 40 years implementing a successful, workable business model to address the needs and challenges of affordable managed healthcare.

FROM METEORITES TO MEDICINE:

Reading the Body's Hidden Chemical Clock



Caltech professor and geochemist François Tissot, Ph.D., is transforming fingernails into a time-resolved record of human health.

Before Dr. Tissot turned his attention to human health, he was reading something far more distant: the early solar system. As a geochemist trained in cosmochemistry, he learned to decode isotopic signatures preserved in meteorites, subtle chemical variations that reveal how planets formed, differentiated and evolved over billions of years. Today, at the California Institute of Technology (Caltech), he applies that same analytical precision to a very different system: the human body.

François Tissot, Ph.D., in his laboratory at the California Institute of Technology, where he applies isotope geochemistry to the study of human health.

Working within Caltech and the Heritage Medical Research Institute (HMRI), supported through the vision of Dr. Richard Merkin, Dr. Tissot is part of a growing effort to translate isotope geochemistry into a biomedical language. This support has helped enable early-stage, high-risk translational work that bridges fundamental geochemistry and human health applications. His central insight is deceptively simple.

"Because fingernails grow continuously, they preserve a time-ordered record of the body's elemental chemistry," Dr. Tissot explains. "In effect, they function as a natural archive of the body's chemical clock, smoothing out the noise of daily fluctuations in physiology."

This framing extends into a broader field known as isotope metallomics, which examines how naturally occurring variations in metal isotopes — including calcium, iron, copper, zinc, and magnesium — shift in response to biological processes.

"These isotopic patterns are not injected tracers," Dr. Tissot notes, "but inherent signatures shaped by metabolism itself. Diet establishes the body's baseline isotopic composition, the starting point, while metabolic processes, including transport and

Researchers at the California Institute of Technology conduct a fingernail-based study, applying isotope analysis to advance insights into human health.

"We can begin to reconstruct a trajectory of physiology using a simple biological sample like a fingernail."

~ Dr. François Tissot

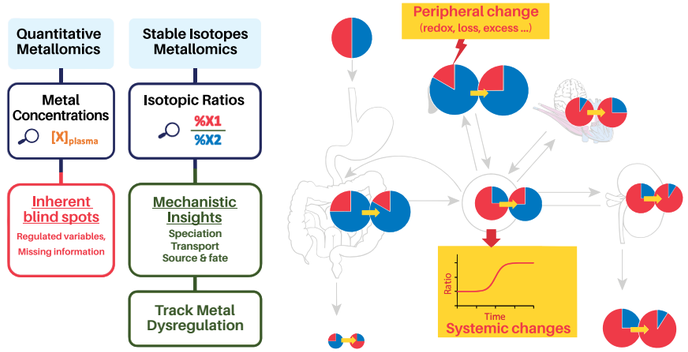
reactions across organs, modify that profile. Different diseases alter how the body handles metals, resulting in departures from the healthy steady state and leaving behind measurable fingerprints."

Beyond the Snapshot

Historically, most approaches in this space have relied on blood, urine or serum — offering only momentary snapshots of a highly dynamic system. Dr. Tissot's contribution is to reframe the temporal dimension: Traditional biofluids capture rapid fluctuations, whereas fingernails, through their slow growth, act as an integrating record that stabilizes isotopic variability by averaging short-term noise into a consistent profile. So far, Dr. Tissot's group has vetted this approach for calcium isotopes in the context of osteoporosis, supporting the development of a noninvasive diagnostic strategy. Expansion to additional isotopic systems is planned.

In practical terms, this transition changes the nature of measurement itself. "We can begin to reconstruct a trajectory of physiology using a simple biological sample like a fingernail," Dr. Tissot says.

The implications are quietly radical. Instead of repeated invasive sampling, a simple nail clipping may one day offer a noninvasive window into



systemic physiology, with each sample averaging roughly three weeks of blood composition and smoothing out the short-term noise seen in urine-based measures. By collecting clippings at successive time points, this approach could build a longitudinal, self-referenced view of health, allowing changes in bone metabolism, liver function or metal homeostasis to be tracked over time without penetrating the body.

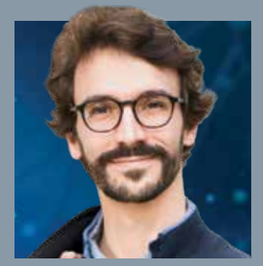
Early collaborations are beginning to probe how these isotopic patterns relate to cellular dysfunction in cancer and other diseases, though the effort remains at an early stage. Current clinical work on the nail-based approach is advancing with Lakeside Community Healthcare, an affiliate of Heritage Provider Network, where recruitment has so far focused on urine and is expected to expand to nail sampling soon. In parallel, a cancer-focused program applying a similar longitudinal strategy to hair is being developed with Cedars-Sinai and is currently in the fundraising and preliminary data phase.

Medicine in Continuous Motion

What began as a question in geochemistry — how to read the history of a planet from its chemical traces — has become, in Dr. Tissot's hands, a new way of thinking about biological time. In this framework, the body is not captured in a single diagnostic snapshot, but is instead read as a continuously written record, accumulating evidence of health and change in layers as steady and revealing as the growth of a nail itself.

In this way, a science born from decoding planetary origins is being reshaped at Caltech, through Dr. Merkin's philanthropic vision, into a framework for detecting the earliest signals of disease and tracing the unfolding trajectory of human health.

As Dr. Merkin notes, "This is the power of investing in fundamental science at the California Institute of Technology and through the Heritage Medical Research Institute: Ideas that begin in planetary research can ultimately reshape how we understand and detect human disease."



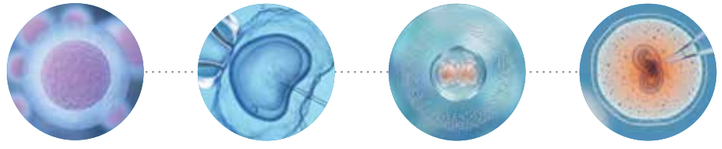
François Tissot, Ph.D.

Professor of Geochemistry and HMRI Investigator at the California Institute of Technology

François Tissot, Ph.D., is Professor of Geochemistry and an HMRI Investigator at the California Institute of Technology. His research focuses on isotope geochemistry and cosmochemistry, using high-precision measurements to study systems at all scales: from the formation of the solar system to the evolution of Earth's surface paleoredox conditions, and including disease onset/ diagnostic and human health.

Where Life Begins: Professors Redefine Fertility Through Science and Translation

At California Institute of Technology (Caltech), a growing cluster of research supported by the Richard N. Merkin Institute for Translational Research is reshaping how scientists understand fertility, from egg development to embryonic self-organization. At the center is Magdalena Zernicka-Goetz, Ph.D., whose work reveals development as a dynamic, resilient process with profound implications for reproductive medicine. In this conversation, she reflects on the convergence driving the field and what it could mean for the future of fertility care.



Q

A number of efforts across the Richard N. Merkin Institute for Translational Research are coalescing around fertility. From your perspective, what has made this convergence possible — scientifically, technologically, or institutionally?

A

What has made this convergence possible is that fertility is no longer seen as a narrow clinical problem, but as a deeply integrative biological question. To understand why reproduction succeeds or fails, we now need to connect genetics, cell biology, bioengineering, imaging and physiology. That kind of convergence was difficult in the past, but today the tools have matured at the same time as we can culture and observe embryos with far greater precision, interrogate molecular pathways at single-cell resolution and increasingly think about intervention rather than description alone.

Institutionally, Caltech is a very special place for this. It brings together people who would not traditionally sit in the same room, yet who can help solve the same problem from very different angles. The Merkin Institute creates the incredible environment where basic discovery and translational ambition do not compete with one another, but actively strengthen one another.

"My dream would be not only to bring the promise of better prediction, but broader access to informed and individualized care."

~ Dr. Magdalena Zernicka-Goetz

Q

IVF has long operated under assumptions about embryo viability that your work now refines. How might this evolving understanding open new possibilities for clinical decision-making and patient experience?

A

Embryos are not fixed entities but dynamic self-organizing systems with more resilience and self-correcting capacity than we once appreciated.

This matters enormously for IVF, because many current decisions are made using relatively limited snapshots of embryo appearance or developmental timing.

If we understand more deeply which embryos are truly nonviable and which are under temporary stress but still capable of healthy development, we may be able to make more nuanced decisions about embryo selection, culture and transfer. For patients, that could mean fewer embryos being discarded unnecessarily, better-informed choices and perhaps a less rigid and more hopeful view of what embryo viability really means.

Q

Much of reproductive biology has historically been observational. Your work extends that paradigm toward thoughtful intervention, whether through culture conditions or gene delivery. What principles guide how you translate that capability into meaningful clinical progress?

A

The first principle is that intervention must come from understanding. We should intervene only when we understand enough biology to do so responsibly and with a clear rationale. The second is that early development is highly sensitive, so any translational step must be guided by great caution, rigorous validation and respect for ethical boundaries.

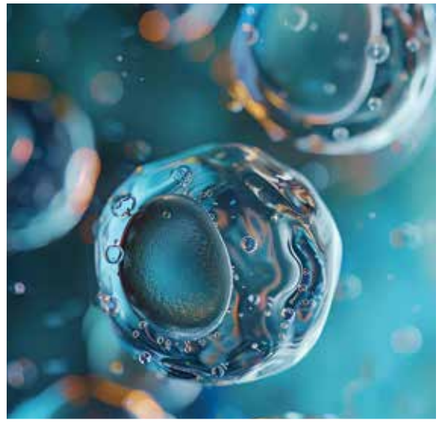
At the same time, we should not accept a purely descriptive science if it leaves patients with no path forward. If we can identify the conditions that help embryos recover, or the molecular causes that underlie infertility, then we would be in a position to ask whether those insights can eventually improve care. For me, the goal is not intervention for its own sake, but intervention that is biologically informed, ethically serious and genuinely useful.

Q

The microscopy emerging from these projects is unusually vivid, almost narrative in its detail. How has the ability to visualize development at this resolution deepened your understanding of how embryos organize and repair themselves?

A

We have spent decades making this level of visualization possible. It has always been my dream to see the embryo not as a diagram or an endpoint, but as life assembling itself in real time, with the hope that it can change our understanding. When you can watch development unfold in real time and with such detail, you no longer see the embryo as a black box. You begin to see that cells are constantly sensing, adjusting, communicating and in some cases, compensating for damage or imbalance. That has made early development feel much more active, much more self-organizing and in many ways more robust than we once imagined.



Q

New diagnostic approaches promise to extract meaningful fertility signals from minimally invasive samples. What opportunities do you see for these advances to broaden access and improve equity in reproductive care?

A

That is one of the most exciting possibilities. If we can obtain reliable information from minimally invasive samples, whether molecular, metabolic or imaging-based, we may be able to move fertility care toward approaches that are less subjective and more accessible worldwide. That would be especially important for patients who currently face financial, geographic or procedural barriers.

Of course, access is not created by technology alone. But better diagnostics can help make care more precise and potentially more affordable, and they may reduce the need for repeated cycles or invasive procedures. My dream would be not only to bring the promise of better prediction, but broader access to informed and individualized care.

Q

Both of your programs sit at an inflection point between discovery and application. Looking ahead, what would success look like, both in the lab and in how fertility is ultimately understood and supported in practice?

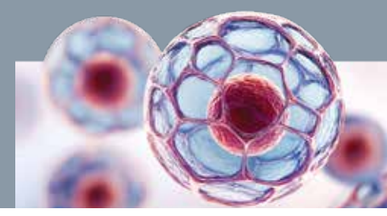
A

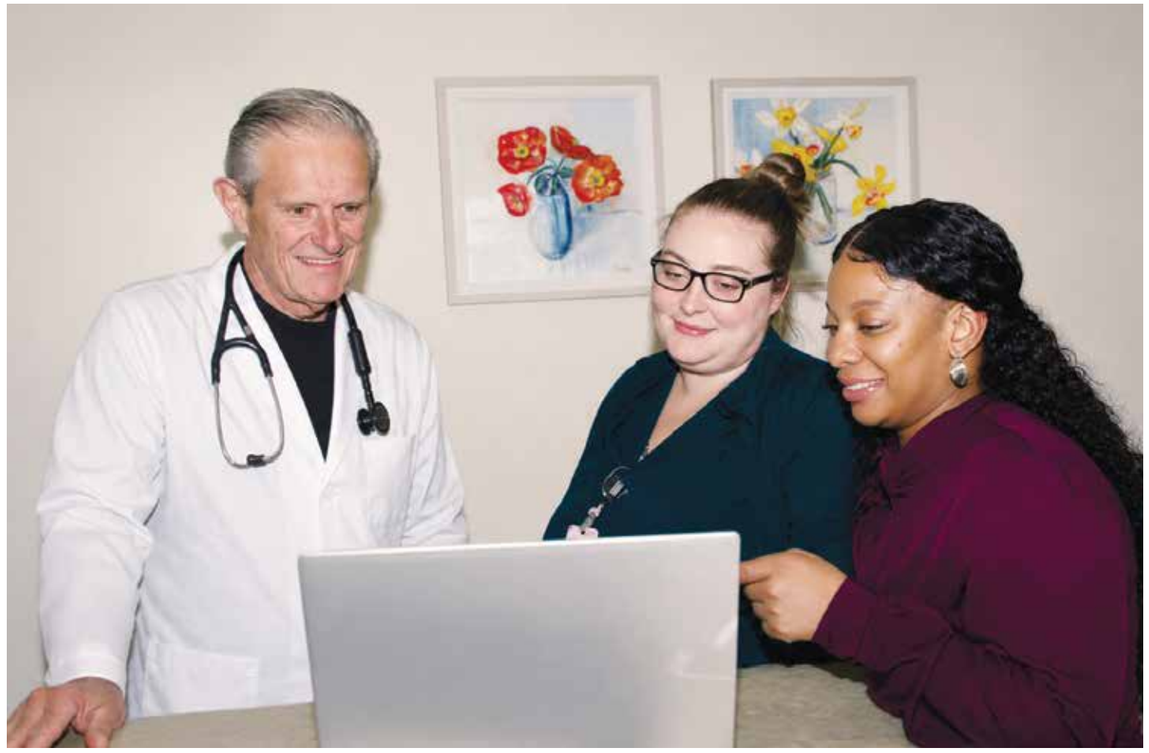
Success would mean moving fertility care from static judgment to dynamic understanding, from asking whether a system has failed to understanding how it might still be supported. It would mean recognizing embryos and reproductive systems as responsive and adaptable, rather than fixed in their outcomes.

In practice, that could translate into more personalized care, better-informed clinical decisions and approaches that support development rather than simply selecting against perceived failure. Ultimately, success would not only be scientific progress, but a shift in how fertility is understood and supported, one that is more precise, more adaptive and more responsive to the underlying biology.

Magdalena Zernicka- Goetz, Ph.D.
Bren Professor of Biology and Biological Engineering California Institute of Technology

Magdalena Zernicka-Goetz, Ph.D., is Bren Professor of Biology and Biological Engineering at the California Institute of Technology. Her research focuses on early mammalian development, particularly how embryos self-organize and establish the foundations of life. Using advanced imaging and stem cell-based embryo models, her work seeks to uncover the principles that govern early development and fertility, with implications for reproductive biology and human health.





Above (left to right): Curtiss Combs, M.D., with scribes Elyssa Baker, medical assistant, and Nyesha Barnes, medical assistant.
Right page: Diana Garcia, medical assistant and scribe.

Thriving in Performance-Based Care

When Curtiss Combs, M.D., opened his first practice 27 years ago, documentation requirements were already increasing and have since grown exponentially. Early in his career, he recognized a fundamental challenge: Delivering high-quality patient care while maintaining a sustainable income would be difficult if physicians remained consumed by administrative tasks.

"Even then, I knew I couldn't accomplish what I wanted for patients or make a reasonable income if I spent so much time on histories and documentation," Dr. Combs says.

While many providers viewed the rise of electronic medical records (EMRs) as an added burden, Dr. Combs saw an opportunity to redesign workflow. "I saw EMRs as a tool," he explains. "The goal was to have most administrative tasks and all documentation performed by someone else, so providers could focus on decision-making."

Through the development of his Efficient Care Training System, Dr. Combs trained medical assistant scribes to manage histories, documentation and care implementation. In this model, providers lead clinically while scribes handle the information gathering and execution.

At Temecula Valley Family Physicians, the results have been significant. Providers often see nearly twice the national average number of patients while taking minimal work home, and the practice consistently achieves strong quality metrics.

"Our scribes allow providers to focus on care," Dr. Combs says. "We're able to see more patients, maintain quality and still have a better work-life balance."

The model depends on consistent, incremental training. Physicians invest time each day developing their scribes' skills, creating long-term gains in efficiency and effectiveness. This approach has improved patient experience, reduced liability and enhanced provider satisfaction.

Despite these operational gains, the practice did not reach its full financial potential until partnering exclusively with Regal Medical Group. With guidance from the Regal Medical Group leadership team, Temecula Valley Family Physicians refined its approach to improve both care delivery and profitability.

"Regal Medical Group didn't just point us in the right direction," Dr. Combs says. "They provided the resources to help us truly manage patient care."

Through close collaboration with Regal Medical Group's medical leadership, the practice coordinates urgent referrals and delivers care in the home when appropriate. This reduces unnecessary hospital visits and helps patients avoid additional risk. Case managers also play an active role in reaching and supporting patients to ensure continuity of care.

"It's a tremendous team effort," Dr. Combs adds. "Everyone is focused on keeping patients healthy and out of the hospital."

As more insurers adopt performance-based models, the practice has been well positioned to succeed. By utilizing medical assistant scribes at a high level and leveraging strong organizational support, Temecula Valley Family Physicians was prepared for this shift.

Looking ahead, Dr. Combs expects artificial intelligence to assume many routine administrative tasks. However, he emphasizes that well-trained personnel will remain essential. "There will be no substitute for people who understand medicine and can carry out complex tasks," he says. "Instead of spending hours on documentation, providers can simply confirm decisions."

> "Regal Medical Group didn't just point us in the right direction. They provided the resources to help us truly manage patient care."
>
> ~ Dr. Curtiss Combs

One of the most meaningful reflections on the model came from a visiting medical director who remarked, "It would be great to have medicine be fun again."

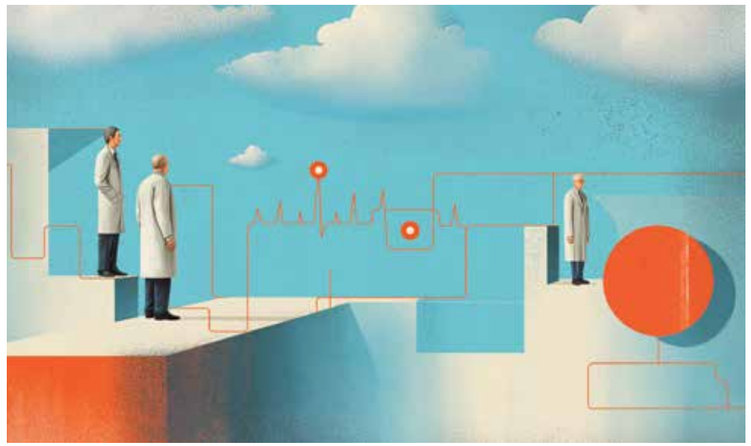
Dr. Combs agrees. With more tools and capabilities available than ever before, he believes this may be one of the most promising times to practice medicine.

"We can do more for patients than ever," he says. "And if providers perform, they can be both profitable and have a great quality of life."

AI-POWERED INSIGHT:

Desert Oasis Healthcare Advances Earlier Detection

At Desert Oasis Healthcare (DOHC), artificial intelligence (AI) isn't replacing physicians. It's strengthening how they deliver care by enhancing clinical judgment, advancing preventive strategies, and helping identify risk earlier than traditional workflows alone allow.



Across the organization, AI-supported tools are surfacing patterns that might otherwise remain hidden within large volumes of patient data. Care teams can identify patients at risk for chronic disease progression, flag gaps in preventive screenings and detect subtle shifts in utilization or lab trends that may signal the need for earlier intervention.

"DOHC has always believed in the idea of human-in-the-loop," says Thomas Brazeal, Pharm.D., associate director of Technology & Process at DOHC. "Our providers see what is happening with the AI. It supports decision-making, but it doesn't make decisions for us."

For patients with diabetes, hypertension and other chronic conditions, care is no longer confined to episodic visits. AI-enabled population health platforms continuously analyze data across encounters, highlighting patients whose metrics suggest worsening control, missed follow-ups or emerging complications. This allows care teams to step in sooner by reaching out, scheduling targeted visits and intervening before conditions escalate.

Preventive care is becoming more precise as well. AI helps identify patients who are overdue for screenings, such as cancer screenings or annual wellness visits, and prioritizes outreach based on risk. With real-time insights integrated directly into existing workflows, physicians can act quickly and confidently without added administrative burden.

As Dr. Richard Merkin notes, "DOHC exemplifies how thoughtful use of technology, combined with strong physician leadership, can meaningfully improve patient care."

"We've seen a meaningful impact over time," Dr. Brazeal adds. "When prescribers are paired with the right monitoring technologies, we see fewer hospital visits and better ongoing management."

From a clinical perspective, the approach reinforces what physicians already do best by applying judgment, context and experience. AI does not make decisions; it highlights patterns. It does not replace the patient-physician relationship; it strengthens it by making critical information more accessible and actionable.

Patients are beginning to feel the difference. In a recent episode of "The Pulse," DOHC patient Irma Valdez Sanford described feeling supported not only during visits, but between them, knowing her care team remains connected and engaged in her health journey.

That continuity is central to DOHC's model. AI enables earlier detection, but it is the care team that turns insight into action by closing gaps in care, coordinating with specialists and adjusting treatment plans in real time.

As healthcare continues to evolve, DOHC demonstrates that innovation and human connection go hand in hand. Technology does not lead care. Physicians do. AI simply brings the picture into sharper focus so care can happen earlier, more precisely and with greater impact.

Heritage Sierra Medical Group Enhances the Patient Experience With Ambient AI

Paula Bailey-Walton, M.D., a physician with Heritage Sierra Medical Group for the past 10 years, focuses on longevity, wellness, mental health, addiction and pain management. She reflects on how ambient artificial intelligence (AI) is reshaping workflow, patient engagement and burnout in her primary care practice.

The technology was introduced in late 2024, initially in response to growing documentation strain and physical fatigue. "I was noticing worsening carpal tunnel symptoms and looking for a modification in how I documented," Dr. Bailey recalls.

Adoption proved more seamless than expected. "The basics were pretty easy to catch onto," she says. "As I continued using the AI assistant, I learned nuances that made my job even easier."

The system quickly improved documentation quality and structure. "It filtered out extraneous information and organized rambling dialogue into a cohesive summary. It even suggests diagnoses based on the information obtained."

Today, ambient AI is used daily to generate more complete progress notes while maintaining clinical accuracy.

One of the most notable changes has been in the visit itself. With documentation occurring in the background, patient interactions have become more focused and less interrupted.

"Since I'm not taking as many notes, I'm able to be a more engaged listener," Dr. Bailey explains. "I think patients appreciate that."

Patients are informed at the start of the visit, and consent is obtained. "They are generally intrigued and receptive to the technology," she notes.

What is Ambient AI?

Ambient AI uses voice recognition and advanced software to listen during patient visits and automatically generate clinical notes, reducing administrative burden and allowing physicians to focus more fully on patient care.

Workflow efficiency has improved significantly. Tasks that once required more than an hour after clinic are now completed during the visit.

"Now I'm able to complete the note and referrals during the visit," she says. "I use the extra time for labs and refills, which helps me stay caught up."

The result has been a meaningful reduction in burnout. "I no longer need to spend weekends catching up or preparing for the next week. I can leave the office on time with my daily tasks fully addressed."

Despite automation, Dr. Bailey emphasizes the importance of review. "I read the notes before I submit them to ensure accuracy and make corrections as needed."

She also notes improved team efficiency, with completed documentation enabling more timely downstream workflows.

Dr. Bailey views ambient AI as a clinical partner rather than a replacement for physician judgment.

"I think AI is an essential tool for the way we practice medicine today," she says. "It allows for more personal engagement during visits and a more thorough record of care."

Looking ahead, she sees broader applications. "I could see AI being used as a triage tool where patients input symptoms and receive a preliminary assessment, with physician oversight for interpretation and physical exam."

Ultimately, she says the greatest impact has been personal.

"It reduces my mental fatigue at the end of the day," Dr. Bailey says. "Thanks to AI, I can devote more time to family and self-care instead of administrative catch-up."

For Dr. Bailey, ambient AI represents not just a workflow improvement, but a restoration of time, attention and balance in modern clinical practice.

EXPANDING THE VISION:

Heritage Provider Network, Regal Medical Group and Lakeside Community Healthcare Now Headquartered in West Hills

Heritage Provider Network, Regal Medical Group, and Lakeside Community Healthcare marked a new chapter with the establishment of a shared corporate headquarters in West Hills, reflecting continued investment in the future of care delivery.

Long rooted in Northridge, California, the move advances a more integrated care network across all three organizations and signals a strategic step to support the organizations' expansive operations, diverse workforce and long-term growth ambitions. The West Hills site is designed to enhance collaboration, streamline administrative functions and strengthen alignment across system-wide operations.

With a strong foundation in place, the West Hills location underscores a shared focus on innovation, scalability and delivering value-driven care to the communities it serves.

"This transition reflects our continued commitment to building an infrastructure that supports our organization and enhances our ability to deliver high-quality care to our members."

~ Dr. Richard Merkin

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Heritage Provider Network
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West Hills, CA 91304