utmb Health

A United Vision for Health Care AI in Texas

UT System AI Symposium

May 15, 2025

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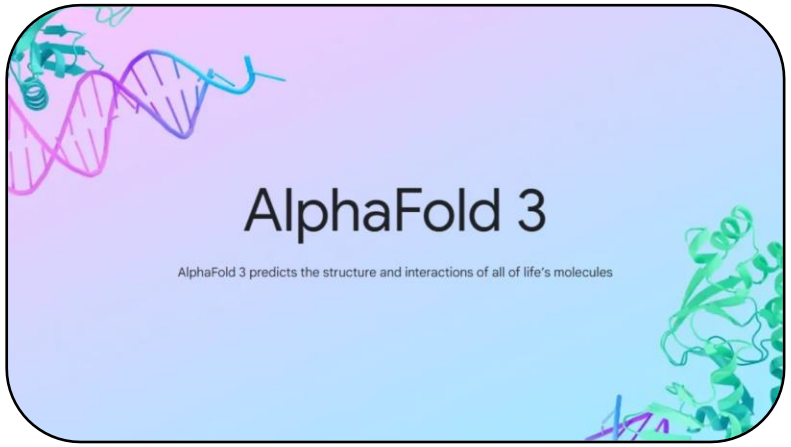
CEO, UTMB Health System
Professor, John Sealy School of Medicine
John D. Stobo Distinguished Chair

The Expanding Frontier of AI

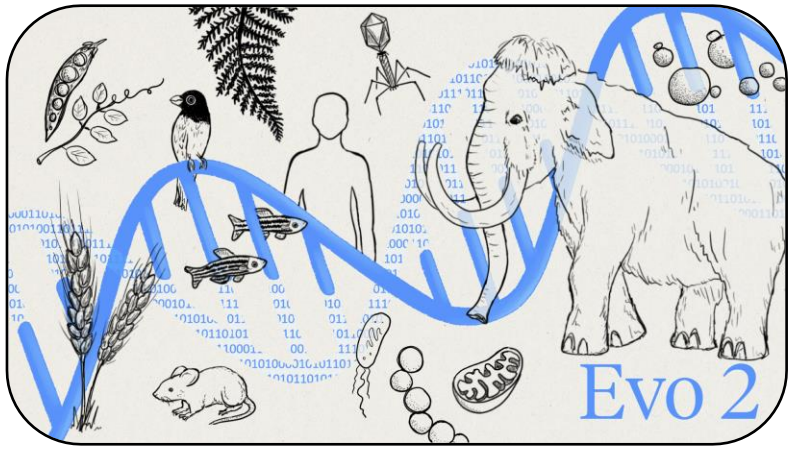
AI Transforming Science



AlphaFold 3
Redefining Our Understanding of Proteins

AlphaFold 3 delivers proteome-scale, near-experimental accuracy in predicting protein structures straight from sequence, unlocking rapid insights for drug discovery, enzyme design, and fundamental biology.

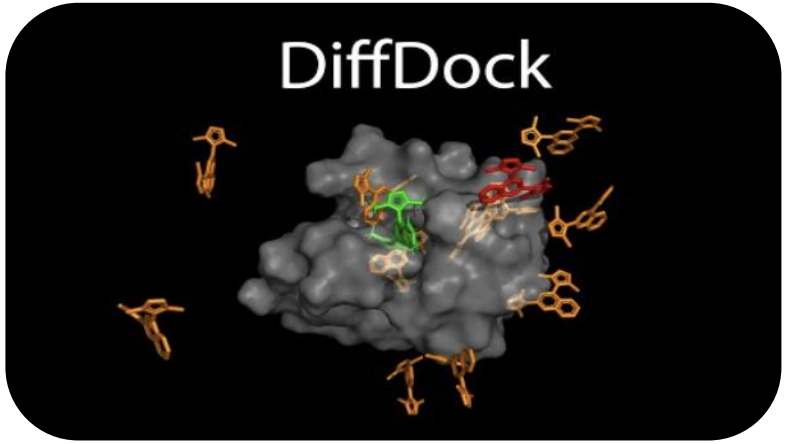
Abramson J, Adler J, Dunger J, Evans R, Green T, Pritzel A, Ronneberger O, Willmore L, Ballard AJ, Bambrick J, Bodenstein SW, Evans DA, Hung CC, O'Neill M, Reiman D, Tunyasuvunakool K, Wu Z, Žemgulytė A, Arvaniti E, Beattie C, Bertolli O, Bridgland A, Cherepanov A, Congreve M, Cowen-Rivers AI, Cowie A, Figurnov M, Fuchs FB, Gladman H, Jain R, Khan YA, Low CMR, Perlin K, Potapenko A, Savy P, Singh S, Stecula A, Thillaisundaram A, Tong C, Yakneen S, Zhong ED, Zielinski M, Žídek A, Bapst V, Kohli P, Jaderberg M, Hassabis D, Jumper JM. Accurate structure prediction of biomolecular interactions with AlphaFold 3. Nature. 2024 Jun;630(8016):493-500. doi: 10.1038/s41586-024-07487-w. Epub 2024 May 8. PMID: 38718835; PMCID: PMC11168924.



Evo 2
A Truly Generalist Biological Foundation Model

Evo2 can accurately predict the functional impact of coding and noncoding genomic variants without any task-specific fine-tuning.

Brixi G, Durrant MG, Ku J, Poli M, Brockman G, Chang D, Gonzalez GA, King SH, Li DB, Merchant AT, Naghipourfar M, Nguyen E, Ricci-Tam C, Romero DW, Sun G, Taghibakshi A, Vorontsov A, Yang B, Deng M, Gorton L, Nguyen N, Wang NK, Adams E, Baccus SA, Dillmann A, Ermon S, Guo D, Ilango R, Janik K, Lu AX, Mehta R, Mofrad MRK, Ng MY, Pannu J, Re C, Schmok JC, St. John J, Sullivan J, Zhu K, Zynda G, Balsam D, Collison P, Costa AB, Hernandez-Boussard T, Ho E, Liu MY, McGrath T, Powell K, Burke DP, Goodarzi H, Hsu PD, Hie BL. *Genome modeling and design across all domains of life with evo 2. bioRxiv 2025 Feb 21, doi: 10.1101/2025.02.18.638918*



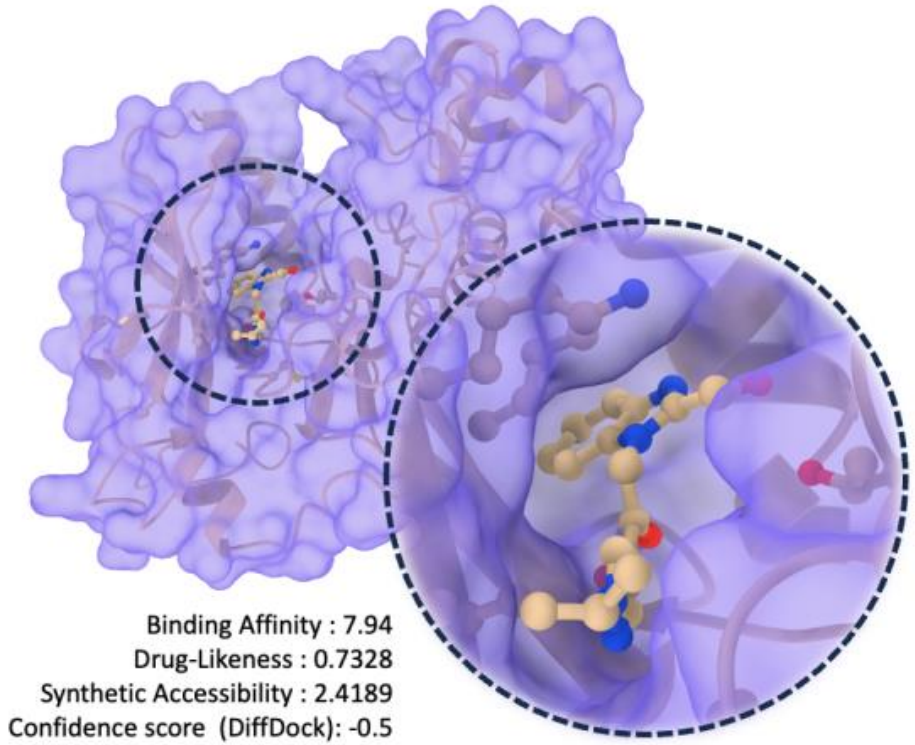
DiffDock
Understanding Functional Biology

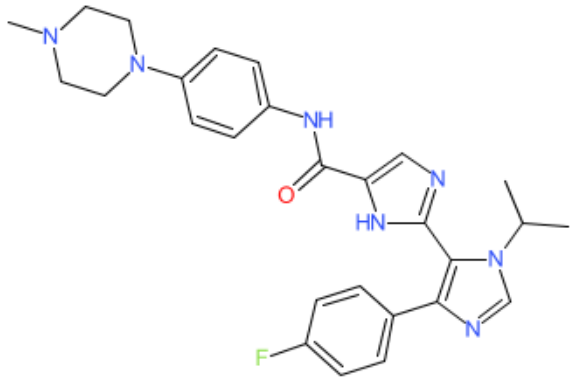
DiffDock predicts highly accurate and diverse ligand–protein binding poses, significantly boosting docking success rates and speeding up structure-based drug discovery.

Corso G, Stark H, Jing B, Barzilay R, Jaakkola T. DiffDock: Diffusion Steps, Twists, and Turns for Molecular Docking. ArXiv 2022 Oct 4. doi: 10.48550/arXiv.2210.01776.

Milestone for Generative AI in Therapeutics

Rentosertib is the first investigational drug in which both the biological target and the therapeutic compound were discovered end-to-end using AI





Rentosertib (INS018-055, InSilico Medicine)

PR Newswire Send a Release

Insilico Medicine Announces Positive Topline Results of ISM001-055 for the Treatment of Idiopathic Pulmonary Fibrosis (IPF) Developed Using Generative AI

Singh A, Tekin E, Nadeem M, Eknaker NA, Sayeed MA, Vassilieva N, Ben Amor B. Chem42: A Family of Chemical Language Models for Target-Aware Ligand Generation. arXiv. 2025 Mar 20. doi: 10.48550/arXiv.2503.16563.

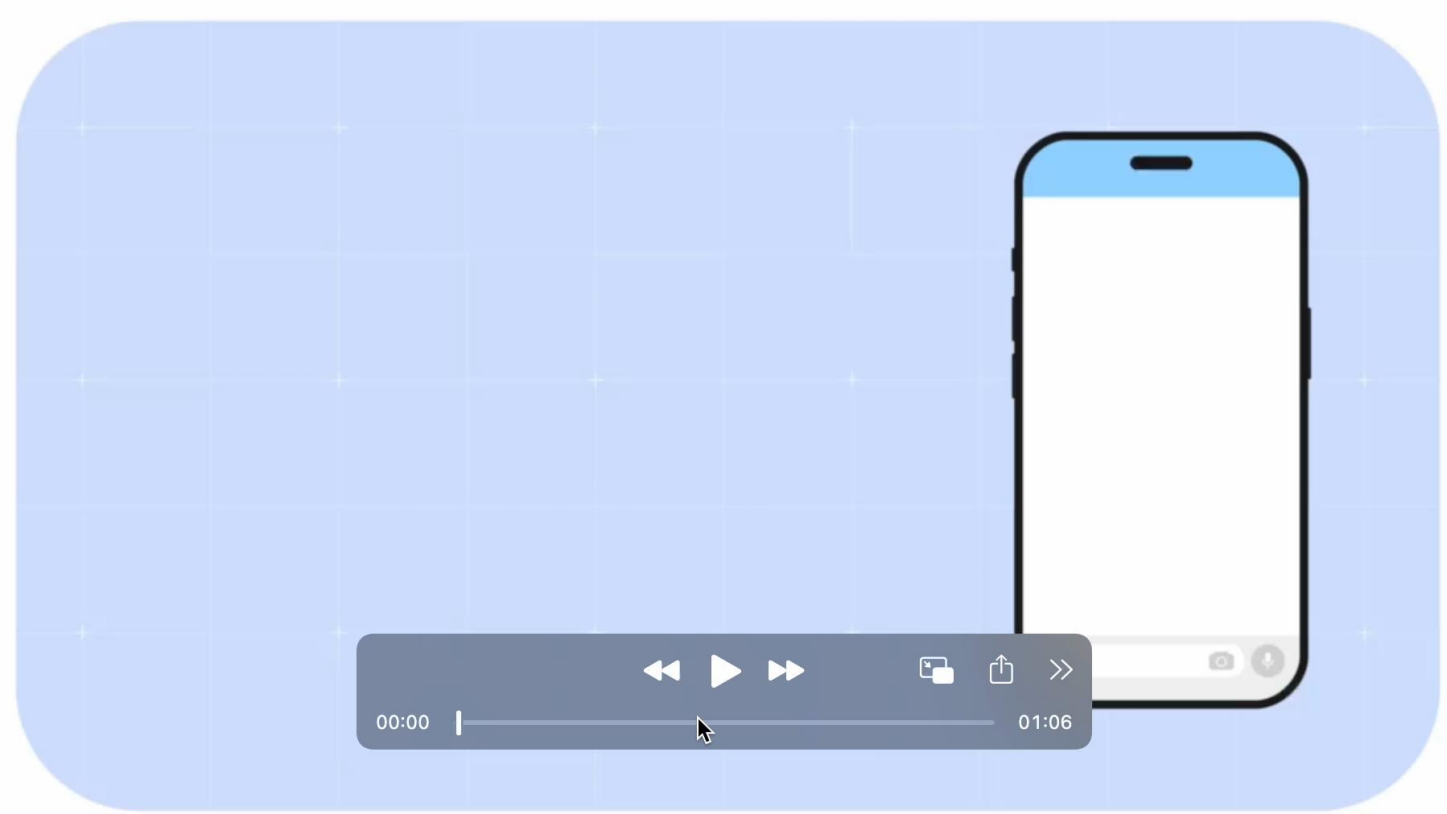
Reflecting on an Expanding Frontier

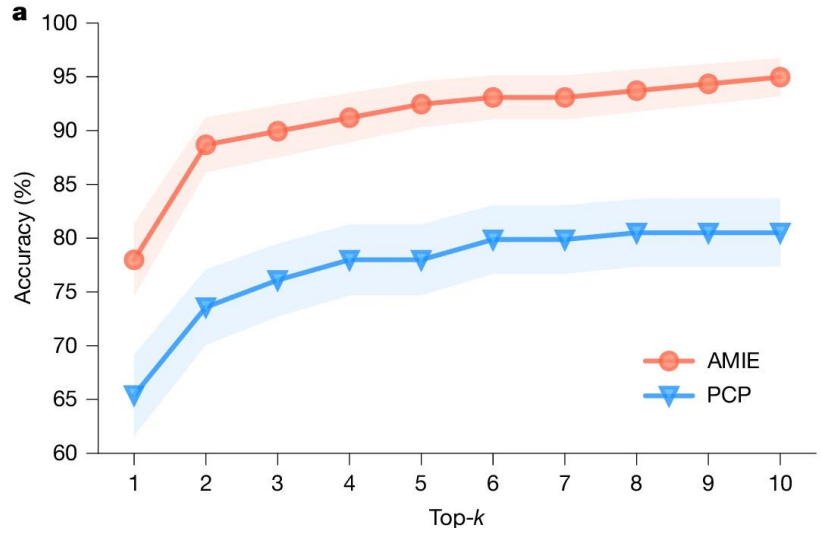
Fundamental AI advancements like **AlphaFold**, **Evo2**, **DiffDock**, and **Rentosertib** highlight a profound shift

- AI is not simply replicating human tasks—it's uncovering **new paths** to knowledge.
- AI models leverage **unique cognitive strategies** that differ fundamentally from human reasoning, often surpassing human limitations
- This evolution also redefines how we approach **complex clinical challenges**, pushing the boundary from assisting human experts to augmenting—and even transforming—the clinical thought process itself.

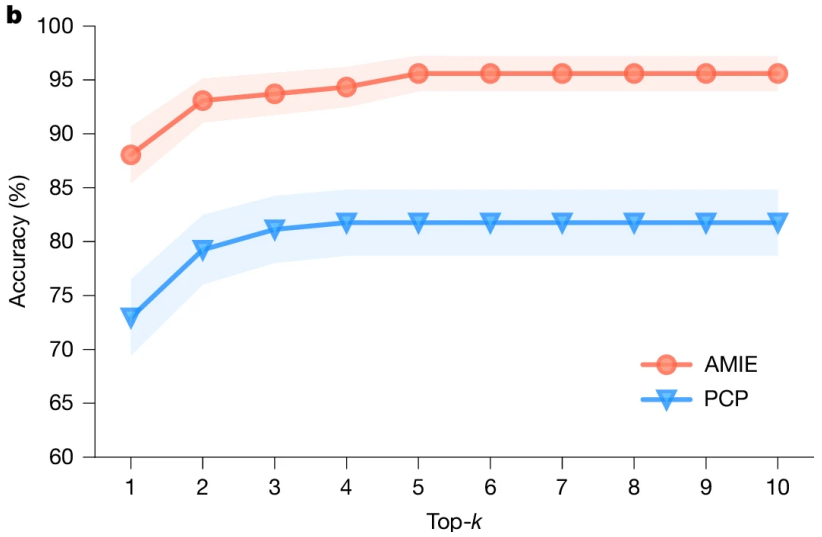
Diagnostic and Conversational AI

Articulate Medical Intelligence Explorer (AMIE)





Ground Truth Diagnosis

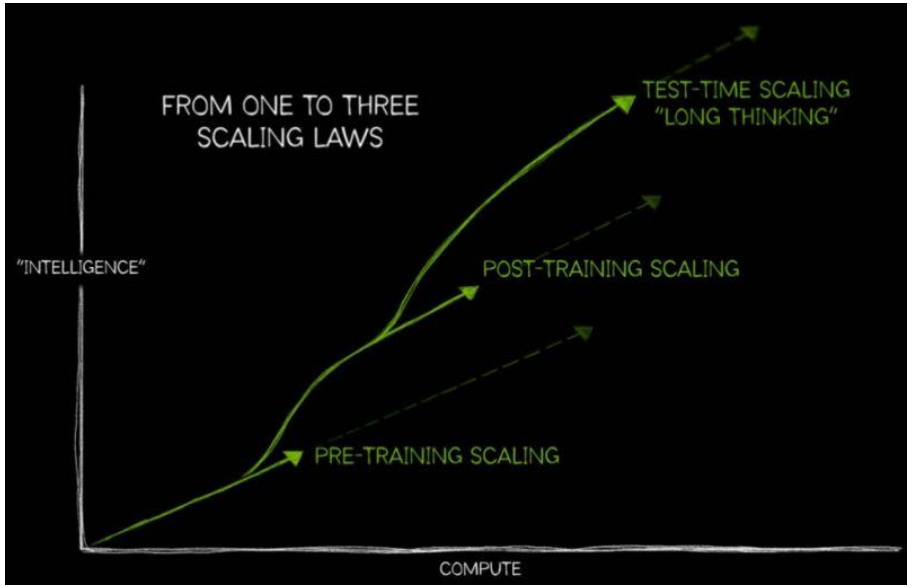


All Diagnoses in Accepted Differential

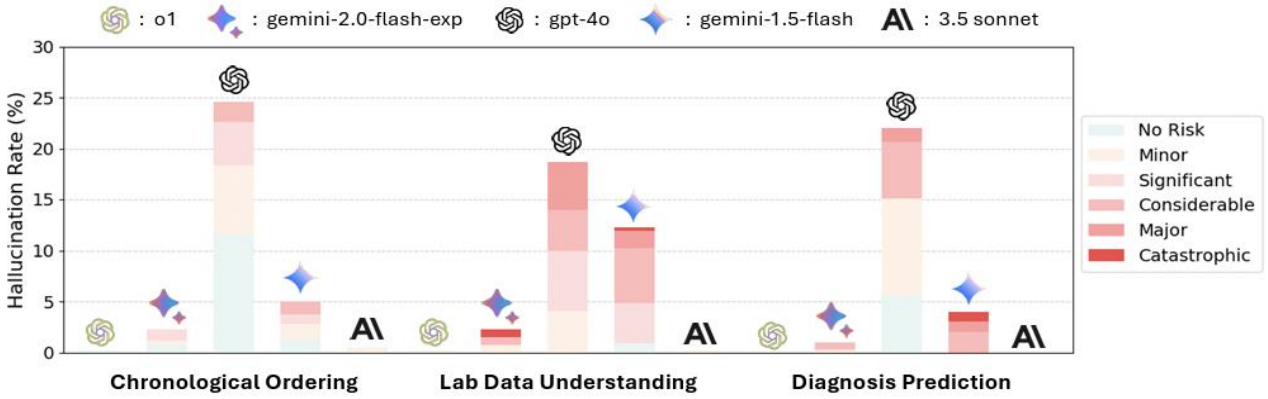
Tu T, Schaekermann M, Palepu A, Saab K, Freyberg J, Tanno R, Wang A, Li B, Amin M, Cheng Y, Vedadi E, Tomasev N, Azizi S, Singhal K, Hou L, Webson A, Kulkarni K, Mahdavi SS, Semturs C, Gottweis J, Barral J, Chou K, Corrado GS, Matias Y, Karthikesalingam A, Natarajan V. Towards conversational diagnostic artificial intelligence. Nature. 2025 Apr 9. doi: 10.1038/s41586-025-08866-7. Epub ahead of print. PMID: 40205050.

An Exponential Future for Health Care

- Scaling laws continue to expand the frontier of AI's potential
- Growth in data, model development, and model behavior will make intelligence more available
- The question is not whether AI will grow—but **how we will grow with it**



*Nvidia, 2025**



*Breazeal et al, 2025***

*https://blogs.nvidia.com/blog/ai-scaling-laws/

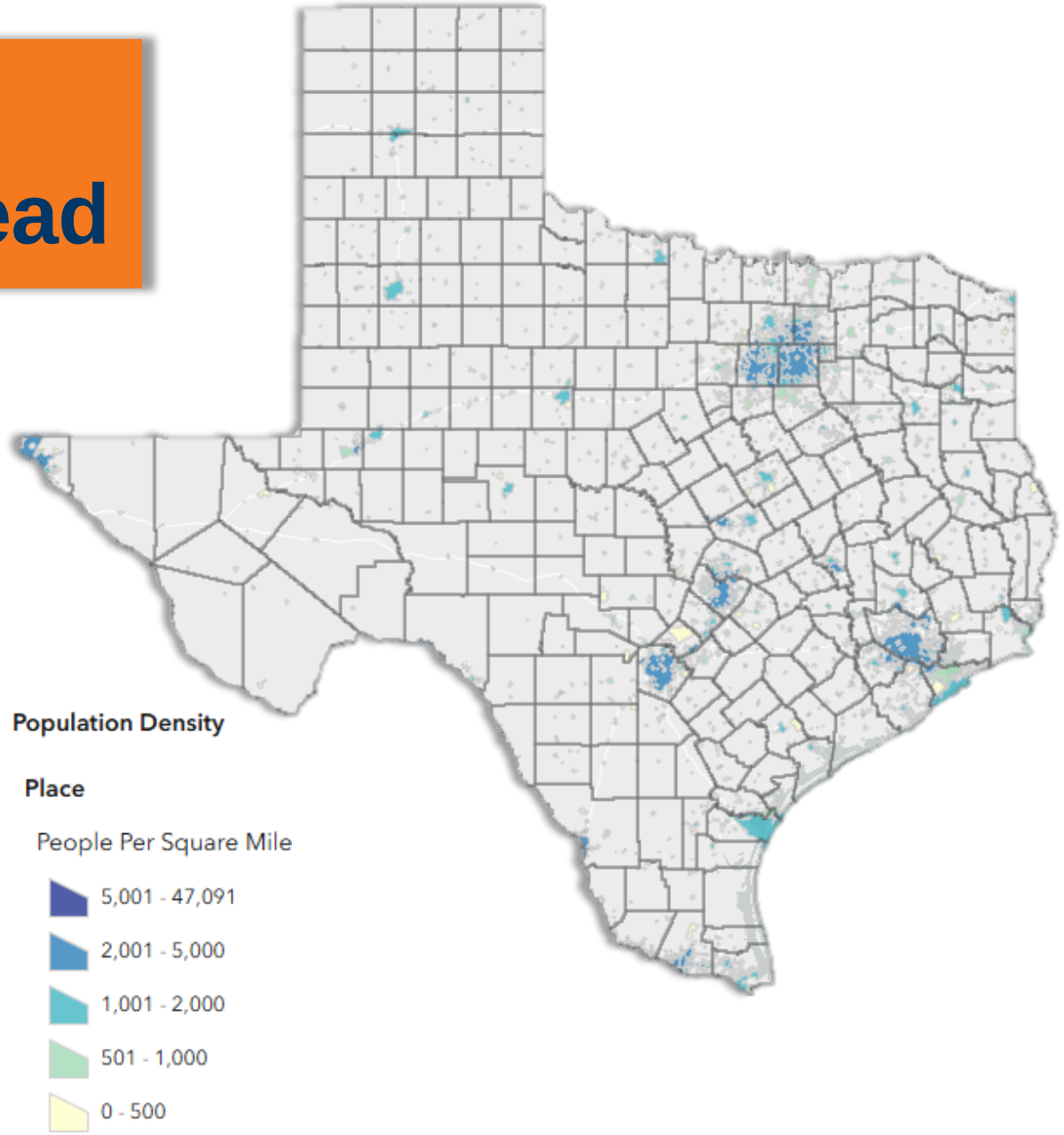
**https://arxiv.org/abs/2503.05777

Why Texas, Why Now

Texas:
Big, Diverse, & Ready to Lead

The Landscape of Opportunity

- Home to **30+ million people**, urban and rural
- **Diversity as strength:** Reflects the global health care future
- If we succeed here—responsibly, equitably, and at scale—**we can inspire the world**



Data Source: U.S. Census Bureau, American Community Survey (ACS) 5-year Estimates, 2019-2023 and 2023 Vintage TIGER/Line files.

A System Built for Scale

Cross-institutional ideas, tools, and outcomes— can be adopted, iterated, and scaled system-wide

This is not a zero-sum game—
Shared Innovation Lifts us All

Examples include UT Collaboratives (HIP, AI) and partnerships with emerging UT startups

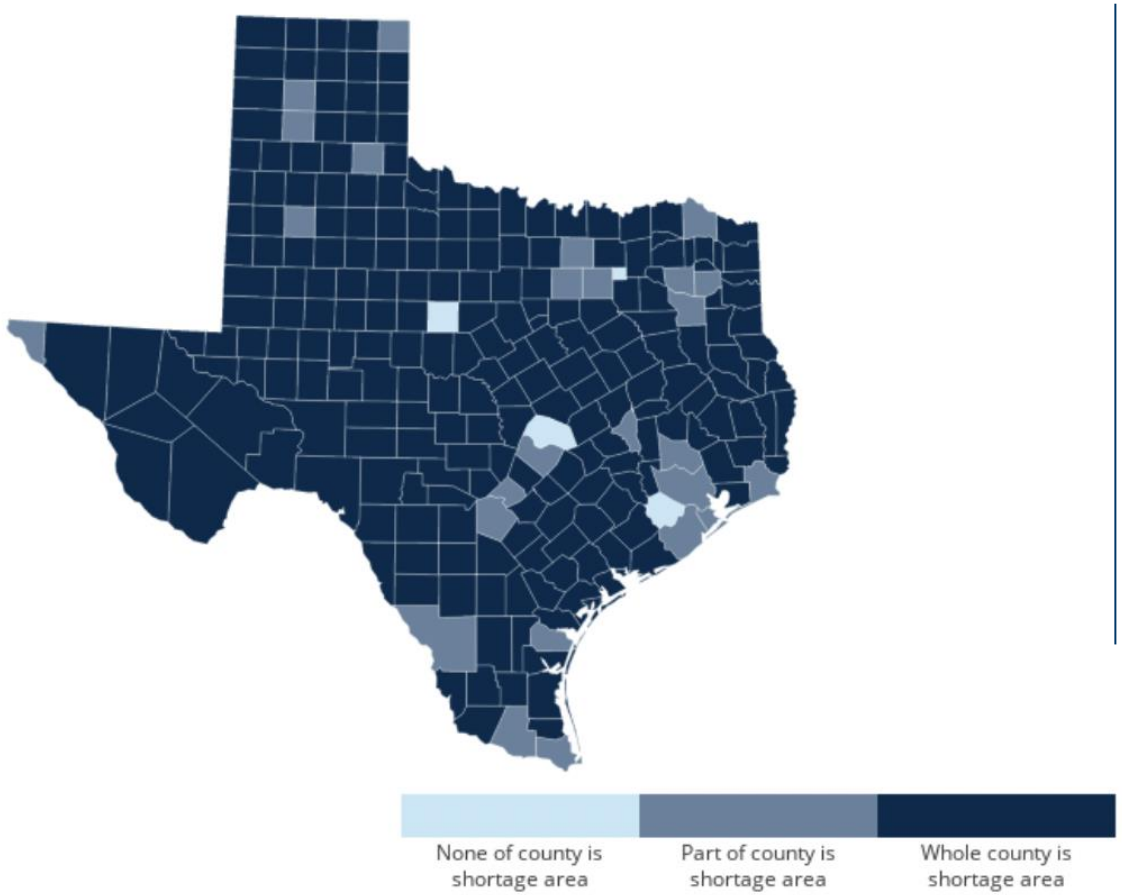
Emphasizing openness and synergy over silos— accelerates meaningful progress

> *"Shared tools. Shared talent. Shared success."*

We Are An Implementation Lab for the World

Can We Scale the Health Care Workforce?

Health Professional Shortage Areas: Primary Care, by County, 2023 - Texas



Can We Impact the Burden of Disease?

- The number of Texas living with Alzheimer's Disease ranks among the highest in the country*
- Texas also bears a high burden of diabetes, heart disease, cancer, and kidney disease, outranking most states nationally.**

Dhana K, Beck T, Desai P, Wilson RS, Evans DA, Rajan KB. Prevalence of Alzheimer's disease dementia in the 50 US states and 3142 counties: A population estimate using the 2020 bridged-race postcensal from the National Center for Health Statistics. Alzheimers Dement. 2023 Oct;19(10):4388-4395. doi: 10.1002/alz.13081. Epub 2023 Jul 17. PMID: 37458371; PMCID: PMC10593099.

**Benavidez GA, Zahnd WE, Hung P, Eberth JM. Chronic Disease Prevalence in the US: Sociodemographic and Geographic Variations by Zip Code Tabulation Area. Prev Chronic Dis. 2024 Feb 29;21:E14. doi: 10.5888/pcd21.230267. PMID: 38426538; PMCID: PMC10944638.*

A Call to Unity

The University of Texas System

UTMB Health

UT Tyler
THE UNIVERSITY OF TEXAS AT TYLER

UTHealth Houston

UT Health San Antonio

UT Southwestern Medical Center

THE UNIVERSITY OF TEXAS MD Anderson Cancer Center
Making Cancer History®

The University of Texas at Austin
UT Health Austin

UT Health Rio Grande Valley

"We Stand As One System, Committed To Transformative Impact."

AI's Reality—Promise + Pitfalls

AI Can Drive Meaningful Outcomes

- **Human/AI mammogram screening** is shown to be noninferior to Human/Human standard double read protocols and even shows a higher detection rate in large RCTs (PRAIM; DRKS00027322)***
- **AI-powered incidental coronary artery calcium scoring** drove a nearly 8-fold increase in guideline-directed statin prescription and a nearly 5-fold increase in testing for coronary artery disease (NOTIFY-1; NCT04789278)*
- **AI-assisted ECG interpretation** reduced all-cause mortality post-discharge for monitored patients (NCT05118035)**
- **AI-assisted endoscopy** significantly reduces the risk of a missed adenoma and polyp by over 50% (meta-analysis of 7 RCTs)****

*Sandhu AT, Rodriguez F, Ngo S, Patel BN, Mastrodicasa D, Eng D, Khandwala N, Balla S, Sousa D, Maron DJ. Incidental Coronary Artery Calcium: Opportunistic Screening of Previous Nongated Chest Computed Tomography Scans to Improve Statin Rates (NOTIFY-1 Project). Circulation. 2023 Feb 28;147(9):703-714. doi: 10.1161/CIRCULATIONAHA.122.062746. Epub 2022 Nov 7. PMID: 36342823; PMCID: PMC10108579.

**Lin CS, Liu WT, Tsai DJ, Lou YS, Chang CH, Lee CC, Fang WH, Wang CC, Chen YY, Lin WS, Cheng CC, Lee CC, Wang CH, Tsai CS, Lin SH, Lin C. AI-enabled electrocardiography alert intervention and all-cause mortality: a pragmatic randomized clinical trial. Nat Med. 2024 May;30(5):1461-1470. doi: 10.1038/s41591-024-02961-4. Epub 2024 Apr 29. PMID: 38684860.

***Eisemann N, Bunk S, Mukama T, Baltus H, Elsner SA, Gomille T, Hecht G, Heywang-Köbrunner S, Rathmann R, Siegmann-Luz K, Töllner T, Vomweg TW, Leibig C, Katalinic A. Nationwide real-world implementation of AI for cancer detection in population-based mammography screening. Nat Med. 2025 Mar;31(3):917-924. doi: 10.1038/s41591-024-03408-6. Epub 2025 Jan 7. PMID: 39775040; PMCID: PMC11922743.

****Jin XF, Ma HY, Shi JW, Cai JT. Efficacy of artificial intelligence in reducing miss rates of GI adenomas, polyps, and sessile serrated lesions: a meta-analysis of randomized controlled trials. Gastrointest Endosc. 2024 May;99(5):667-675.e1. doi: 10.1016/j.gie.2024.01.004. Epub 2024 Jan 4. PMID: 38184117.

But the Evidence Base is Still Evolving

We need to come together to build a stronger, clearer understanding of where AI works and where it doesn't

- Data from over 2.5 million encounters and over 7,200 providers at Kaiser showed ambient AI saving around 1-2 minutes of time per note on average but mileage varies greatly by user*
- Some studies have shown an overall increased physician burden for AI-assisted communications (like patient messaging) and an increase in physician cognitive load**

Successful AI is deeply dependent on workflow, clinical buy-in, and mutual understanding, and this continues to be demonstrated repeatedly***

*Tierney, A., et al. (2025). Commentary: Ambient Artificial Intelligence Scribes: Learnings after 1 year and over 2.5 million uses. NEJM Catalyst.

**Tai-Seale M, Baxter SL, Vaida F, Walker A, Sitapati AM, Osborne C, Diaz J, Desai N, Webb S, Polston G, Helsten T, Gross E, Thackaberry J, Mandvi A, Lillie D, Li S, Gin G, Achar S, Hofflich H, Sharp C, Millen M, Longhurst CA. AI-Generated Draft Replies Integrated Into Health Records and Physicians' Electronic Communication. JAMA Netw Open. 2024 Apr 1;7(4):e246565. doi: 10.1001/jamanetworkopen.2024.6565. PMID: 38619840; PMCID: PMC11019394.

***Ayorinde A, Mensah DO, Walsh J, Ghosh I, Ibrahim SA, Hogg J, Peek N, Griffiths F. Health Care Professionals' Experience of Using AI: Systematic Review With Narrative Synthesis. J Med Internet Res. 2024 Oct 30;26:e55766. doi: 10.2196/55766. PMID: 39476382; PMCID: PMC11561443.

How Do We Meaningfully Work With AI?

We need to come together to build a stronger, clearer understanding of where AI works and where it doesn't

- Those who use AI consistently reap much more benefit that those who do not. In documentation tasks, this can be a 4- or 5-fold difference in efficiency*
- We need to consider workflow and to rigorously apply implementation science in order to realize the value that AI can have
- This is increasingly important for us all as the imperatives to make health care work at scale are only growing more urgent

**Tierney, A., et al. (2025). Commentary: Ambient Artificial Intelligence Scribes: Learnings after 1 year and over 2.5 million uses. NEJM Catalyst.*

Our Strategic Value

Our Value Proposition for Health Care AI

- **Enhance the human experience** in health care—not replace it
- **Focus on access, quality, and responsiveness**—particularly in underserved and remote regions

Core Value Areas

Improve Services

Streamlining tasks like scheduling appointments, requesting refills, and using telemedicine more easily and efficiently

Restore the Human Connection

Reducing clerical burden through automated documentation, summarizing patient records, and improving response time to patients

Expand Possibility

Unlocking new capabilities like gene therapies, drug discovery, and augmented reality surgical planning

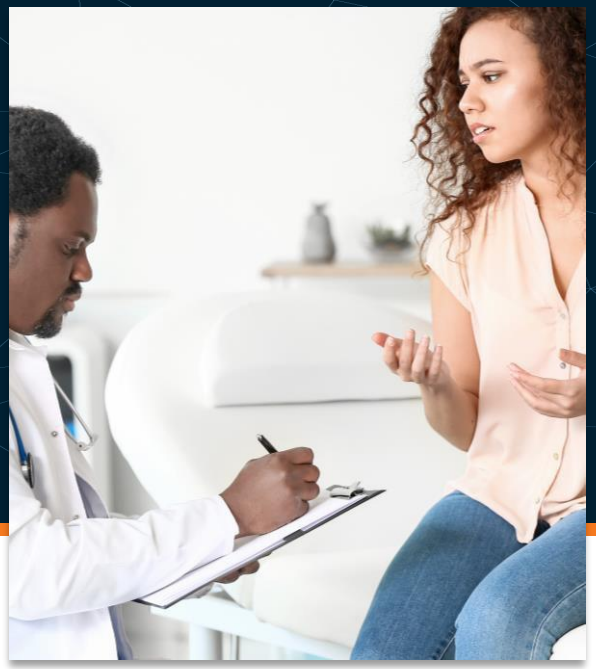
Personalize Care

Enabling more active disease screening, tailored risk prediction, and targeted therapies specific to each patient

Some Initiatives at UTMB

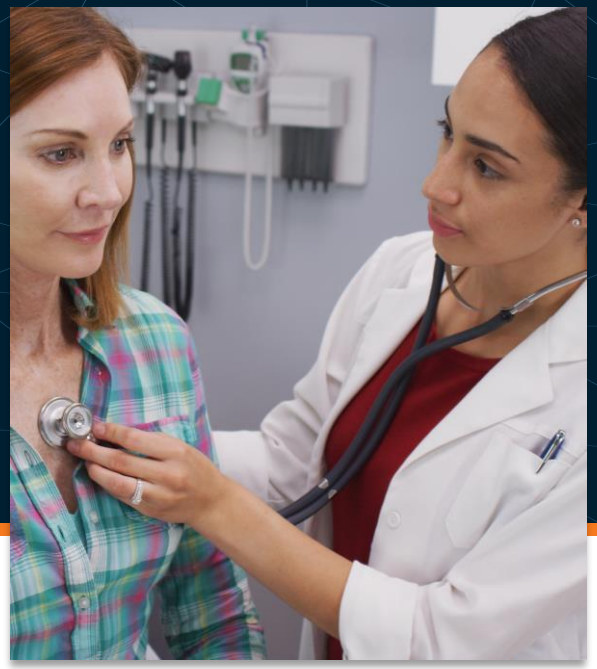
Ambient Dictation

Improving documentation and reducing provider burden



Responsive Patient Messaging

Using AI to triage and accelerate patient communication



Personalized Risk Screening

Proactive identification of at-risk patients across cardiology, nephrology, and others

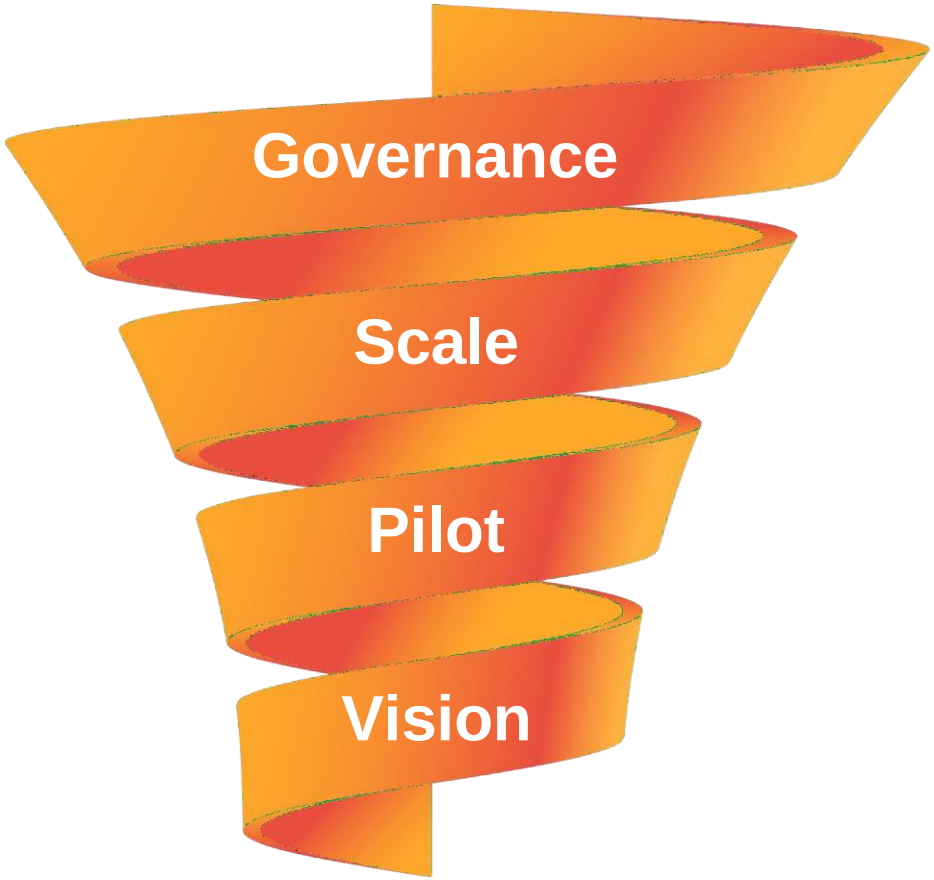
Generative AI Access Across Enterprise

Tools made available to both clinicians and students

Responsible Innovation at UTMB

Ethical AI

- **Deployed for impact**, not novelty
- Focus on **thoughtful governance, pilot evaluation, and human oversight**



- Responsibility also means a **commitment to understand** and **master these tools**, something we can only do through a culture of exposure and experimentation, not one of avoidance

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Transforming Education

Educational Transformation Through AI

Leveraging AI Tools

- Supports student learning
- Streamline assessment
- Enhances mentorship across disciplines
- Prepares adaptable, forward-thinking leaders

Delivering personalized pedagogical attention to every student—enabling learning and mentoring at scale

Transforming the education of tomorrow's professionals

Extending our commitment across nursing, allied health professions, and graduate biomedical science programs

This matters deeply—
UTMB trains ~1 in 6 Texas physicians

Education and AI are Coming Together

AI helps enrich the training experience, enabling students to become more capable professionals

- Simulated patient interactions help to hone communication skills and build comfort with the craft of patient communication, history taking, and summarization*
- Self-explaining AI further changes the horizon as AI tools can teach users how to use AI, simultaneously honing the craft of effective AI use while helping people achieve various other goals
- Expertise is driven by experience and AI may allow us to broaden experience for all of our trainees
- Further, education is most meaningful when delivered in the most relevant moment. Having knowledge at your fingertips **DURING** your training and professional practice makes that knowledge more useful

> *"It's about lifelong learning, embedded in practice."*

*Kizilcec, et al, 2025, https://arxiv.org/abs/2503.05793

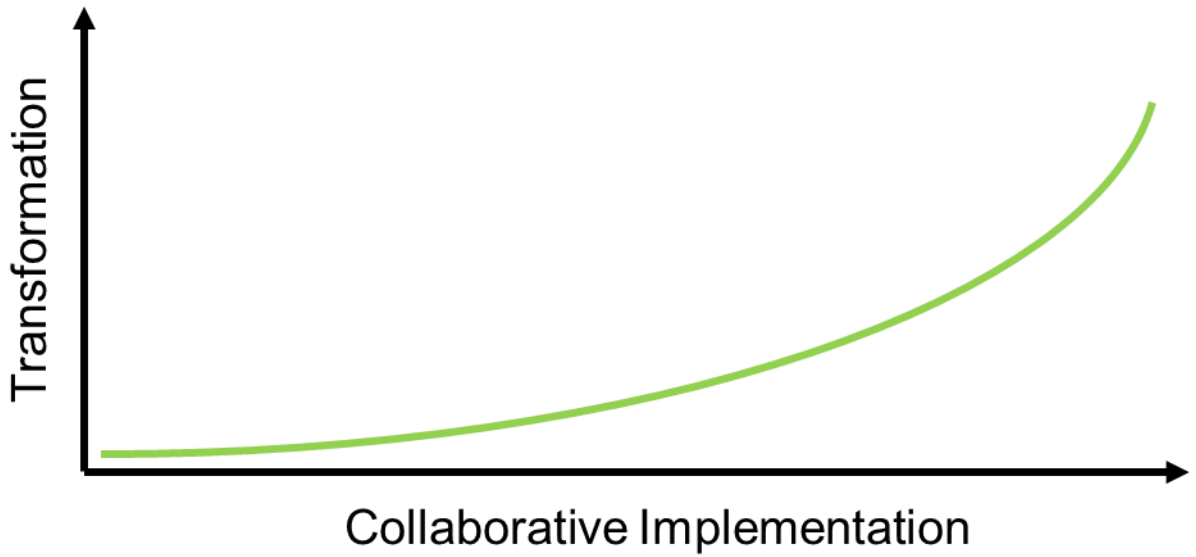
Innovation and Vision

Partnering for Innovation

- **UT-HIP AI Collaborative**
  - A cross-campus effort to guide responsible deployment and share best practices
- **Following Leaders in the System**
  - Inspired by UT Southwestern’s involvement in Microsoft's Trustworthy & Responsible AI Network (TRAIN) and the Coalition for Health AI (CHAI)
- **Partnering with Start-ups**
  - Collaborations with UT-affiliated start-ups like those from UT San Antonio
  - Commitment to nurturing homegrown innovation within our ecosystem

Implementation Is Our Scaling Law

We Need to Co-Evolve with AI



- In so doing, we need not only to support our workflows but to change them, and challenge them
- The value, utility, and reliability of AI in real healthcare is subject to a **new scaling law defined by our implementation** and the rigor with which we test and track real processes with these tools

Conclusion

Blueprint for Progress

A Future We Build Together

> *“Let us be the system that wrote the playbook on how to do this right.”*

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Questions?