

Testimony before the United States House of Representatives

Committee on Veterans' Affairs

Subcommittee on Health

Hearing on "Artificial Intelligence at VA: Exploring its Current State and Future Possibilities"

February 15, 2024

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Chairwoman Miller-Meeks, Ranking Member Brownley, and Esteemed Members of the Subcommittee - thank you for the opportunity to testify today, on current state and future uses of AI in the VA. I am honored to appear before you today as an author, a health AI practitioner, and as a tireless advocate for transformative change in healthcare. My name is Prashant Natarajan, and I am here to testify on how we can demystify health data, supercharge the potential of artificial intelligence (AI), and empower humans.

As lead author or co-author of four books on AI and data-driven decisioning making, I have dedicated over twenty years to practicing, researching, and documenting the complexities of innovation and change management in the health and life sciences sectors¹. With the nation's leading physicians

¹ Demystifying AI for the Enterprise (2021), Demystifying Big Data and Machine Learning for Healthcare (2017), Multidisciplinary Approach to Head & Neck Cancer (2017), and Implementing Business Intelligence in Your Healthcare Organization (2012)

and health technologists as co-authors and case study contributors, my books demystify data science and digital transformation for patients, caregivers, physicians, nurses, administrators, and policymakers alike.

I work as Vice President of Strategy and Products at H2O.ai—an open-source generative AI company, with responsibilities for health systems, pharmaceutical companies, and public sector health. Before joining H2O.ai, my professional career included global stints as product leader and consulting principal at Oracle North America, Deloitte Consulting Australia, Unum Group, McKesson Health Services, and Siemens.

I commend you for convening today’s pivotal hearing on “Artificial Intelligence at VA: Exploring its Current State and Future Possibilities.” With Generative AI, we have a “once in a lifetime” opportunity to solve long-standing challenges and create transformational health and economic opportunities for America’s veterans and their families, and the clinicians who serve them.

This cause is deeply personal to me beyond professional expertise and interests. Since 2016, I have been volunteering as Industry Advisor, Data Science & AI at San Francisco VA Medical Center (SFVAMC) and University of California at San Francisco (UCSF), where AI is being developed to improve the speed and quality of brain imaging as well as automatically extracting clinically useful information from brain CT and MRI, especially for veterans with **Traumatic Brain Injury (TBI)**. Our efforts include the development of deep learning, and more recently, generative AI technologies such as transformer neural networks and denoising diffusion models. As a result of this work, we expect AI to improve diagnostic accuracy and reduce medical errors; drive cost-effective equipment utilization; and increase physician empowerment.

AI has enhanced our collective knowledge in the enterprise, expanded commerce, and elevated productivity in the workplace. Health systems, academic medical centers, life sciences and

biotechnology companies, health and disability insurers, and public sector entities have already brought hundreds of AI use cases to life.² While there are diverse AI success stories, our veterans still face inconsistencies related to healthcare access, knowledge, and care gaps. Based on my experience with patient- and clinician-focused AI products, generative AI provides ways to address these gaps and inconsistencies.

Generative AI

A new era emerges with Generative AI with the coming democratization of health knowledge, new innovations in care delivery, and most importantly, personal health outcomes. This new AI is not merely artificial or automated, but **amplified and augmented intelligence**. It empowers and benefits individual veterans directly and measurably when designed for **shared decision making**.

Generative AI is a new and powerful equalizer for patients and clinicians. It transcends barriers and empowers individuals by democratizing the language of computing. No longer do we need armies of technologists, data engineers, and data scientists to accomplish the generation of actionable insights. Any veteran or clinician – with the need for answers, access to data, and access to an AI sandbox environment – can now analyze complex multimodal data (text, images, videos); build analytics tools using plain language (English, Spanish, etc.); finetune Large Language Models (LLMs), or design personal generative AI applications.

The following example is a real-life illustration of how generative AI can empower users in their regular tasks and daily lives.

Scores AI

² Health AI Use Case Catalog: <https://health.h2o.ai/h2o-ai-health-usecase-catalog/full-view.html>

Our 11-year-old daughter, Shivani, bakes as a hobby. Previously, she used her mother and Google for advice and recipes until she heard about ChatGPT. After we trained her for an hour, we left her to her devices until she surprised us with delicious savory scones a week later. These scones were a new creative first for her but with a recipe where AI was a co-chef and more. Using an LLM-powered chatbot, she created new recipes, collaborated with her friends on packaging; and is now in the process of creating her first AI app for other novice bakers. More importantly, she did this on her own with her new AI tools simultaneously serving the roles of expert chef, chemistry mentor, taste tester, and a collaborator who is more helpful than her parents. How did this achieve this fluency and what did she do with generative AI?

In short, Shivani used LLMs and chatbot interfaces (ChatGPT and h2oGPT) to

- Ask questions about baking and discover existing scone recipes, or **Prompting**
- Provide feedback on the AI results and help the AI improve itself based on her instructions, or **RLHF** (Reinforced Learning with Human Feedback)
- Use the answers in her subsequent prompts and taught the AI to play distinct roles (as food critic and content creator), or **Prompt Engineering**
- Add public PDF documents on nutrition data and macros to create a custom dataset, and query the combined unstructured data and documents using **RAG** (Retrieval Augmented Generation)
- Labeling to improve the quality of the labeled results, or **Finetuning**
- Creating an autonomous agent to refresh buyer requirements and feedback, or **AI Agent Development**
- Developing the new Scones AI workflow that will allow her to accept mobile phone text orders from the community, or **Generative AI App Development**

Personal Health AI – designed, built, and used by Veterans

If an 11-year-old with no prior knowledge of or exposure to AI could do this in a few days, imagine the possibilities in front of veterans, their family members, and clinicians in the VA. If we expand AI in the VA to meeting each veteran’s or clinician’s unique requirements/expectations – beyond the organizational needs that already exist – we will have enabled veterans to

- Better manage daily living – diet, activities, appointments, prescription refills
- Become informed participants in the determination of health outcomes – and active contributors to the treatment plan
- Forge deeper connections with physicians and caregivers
- Develop, deploy, and use disease-, environment-, and task-specific AI assets
- Create peer-to-peer best practices
- Explore/establish “on demand” collaboration spaces, monetization channels, and entrepreneurship opportunities

Our work in the Stanford-Pfizer **Public Led Opportunity Training** (PLOT) program³ demonstrates that not only are these goals achievable but also provides a framework for education, reskilling, and mentoring for patients to become patient-researchers, prompt engineers, data analysts, and obtain grant funding. In the last 12 months, we have trained fourteen patients to become informed patient researchers and help them create AI products that are specific to their disease/s, demographic background, and other realities of their lives. The result is Personal Health AI, where the individual creates the AI they need – as compared to personalized AI where the organization or institution determines what works best for a broader cohort of people with similar characteristics.

³ [GMG 2022-HOS-G_SupportingPatientPoweredResearch.pdf \(pfizer.com\)](#)

Provider Health AI – designed, built, and used by VA Clinicians

The COVID pandemic has created new challenges for physicians and nurses in the VA and beyond. Post-pandemic, the needs of our veterans have increased but the health and wellness of those who serve them has gone into a steep decline. VA clinicians report reduced job satisfaction, increasing health challenges, precipitous burnout, and reduced face time with their patients. Despite best intentions, technology modernization and administrative simplification programs have delivered suboptimal results for our clinicians – even as we redesign systems and workflows frequently.

Generative AI – as described above for veterans – can provide similar benefits for doctors, nurses, and allied health professionals by allowing them to create scientific AI assets and workplace assist agents, such as

- Systematic review of hip and knee replacement procedures for orthopedic surgeons
- Patient-friendly discharge notes generator
- Guidelines-based AI agents for diverse specialties
- Smart appointments manager

VA clinicians are looking for solutions that will bring relief to their work, reduce medical errors, and improve the quality of care. Even as we recognize and support ongoing efforts by the VA to reduce clinician burnout, relief for an individual physician can be as simple as using AI tools to find and enjoy 15 minutes – to relax, decompress, or smell the roses.

Veterans' AI Collaborative

A Veterans' AI Collaborative is one validated approach to support both Personal Health AI and Provider Health AI perspectives as outlined previously.

Connecting veterans, VA clinicians, and veteran groups to data sources, training programs, and AI resources is the need of the hour. Bringing these stakeholders together and creating the opportunities for them to experiment on data and collaborate with each other is the most optimal way to create sustainable, bottom-up, and cost-effective AI innovations. Public-private partnerships like the California Initiative to Advance Precision Medicine (CIAPM) are proven efforts that enabled collaboration between, and brought verifiable value to, researchers, physicians, and patients. The recently launched National Artificial Intelligence Research Resource (NAIRR) pilot is a commendable effort and can serve as an invaluable foundational resource for our collaborative.

We must learn from the successes and failures of similar partnerships & pilots – while keeping in mind the new capabilities coming from access to generative AI resources and new user types. Providing access to and training non-traditional users on data science and AI competition platforms, open-source AI software repositories, and natural language-based data science experimentation sandboxes will increase data literacy and improve health outcomes.

Prescriptions for Health AI Success for Veterans and VA

- Recognize AI Fidelity: like the concept of data fidelity, AI Fidelity is about the value of health AI being determined by its user (veteran, clinician, or administrator) in the context of its use. AI use cases can come from anywhere - especially beyond the four walls of any VA facility.
- Regulation & Validation Flexibility: administrative, operational, research and care delivery AI are important and must go through external AI validation as outlined in President Biden’s Executive Order. However, one size does not fit all. AI created or managed by veterans – for their personal and peer uses – within the AI Collaborative must be treated with an appropriately light regulatory touch. Enforcing any new AI regulations, especially the ones that apply to healthcare organizations and business entities – to veteran AI creators and their Personal Health AI, or VA

Clinicians and their Provider Health AI – is counterproductive to bottom-up and user-first value creation.

- Veterans-First AI Ownership: the intellectual property and monetary rights of personal health AI models, applications, and agents must either be
 - with their veteran and/or clinician creators, or
 - distributed under Apache 2.0 licensing as individual veteran’s or clinician’s preference.Private companies including cloud service providers, AI vendors, or data providers must be restricted from using data or insights from the Veteran’s AI Collaborative to train any proprietary data/LLM/AI agents, or extensions. These protections will ensure that veterans’ data/model privacy and economic interests are reinforced.
- Encourage Open Source AI: even as we are just getting started with Generative AI, there are incipient efforts at regulatory capture using compute, storage, the number of LLM model parameters, and exaggerated fears of safety and/or AI omnipresence. Independent of our opinions and biases, we need personal and provider health AI to have access to viable open source platforms, so that veterans and VA clinicians can contribute to them in a trustworthy fashion.

I would like to thank Chairwoman Miller-Meeks and Ranking Member Brownlee for this opportunity to testify today, and all members of the Subcommittee for prioritizing such a critical issue. The VA has no greater priority than ensuring that our veterans receive the best possible care, and this imperative can only be met with AI that addresses veterans’ needs where they receive care and where they live, work, pray, and play.