

Smart Patient Spaces: Applying Intelligent Technology to Spaces across the Care Continuum

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Case Study: HFH Destination Grand

Design and deliver a place of **healing** and **well-being** that is focused on the **experience** and **access** for patients, families, team members, and learners. Create a **destination for health, research, and innovation** that drives economic growth for the **community**.

Case Study: HFH Destination Grand



Henry Ford
Hospital

West
Pavilion

Hospital
Podium
and Tower
Expansion

Shared
Services
Building

New
Parking
Garage

Central
Energy
Hub

Cancer
Center

CC
Parking
Garage

F
B

A

H

I

Case Study: HFH Destination Grand



Case Study: HFH Destination Grand

- 750 smart security cameras
- 14,000 data cables
- 1,828 access control doors
- 658 Smart patient room displays
- 658 AI virtual nursing cameras



53,000 lb steel beam



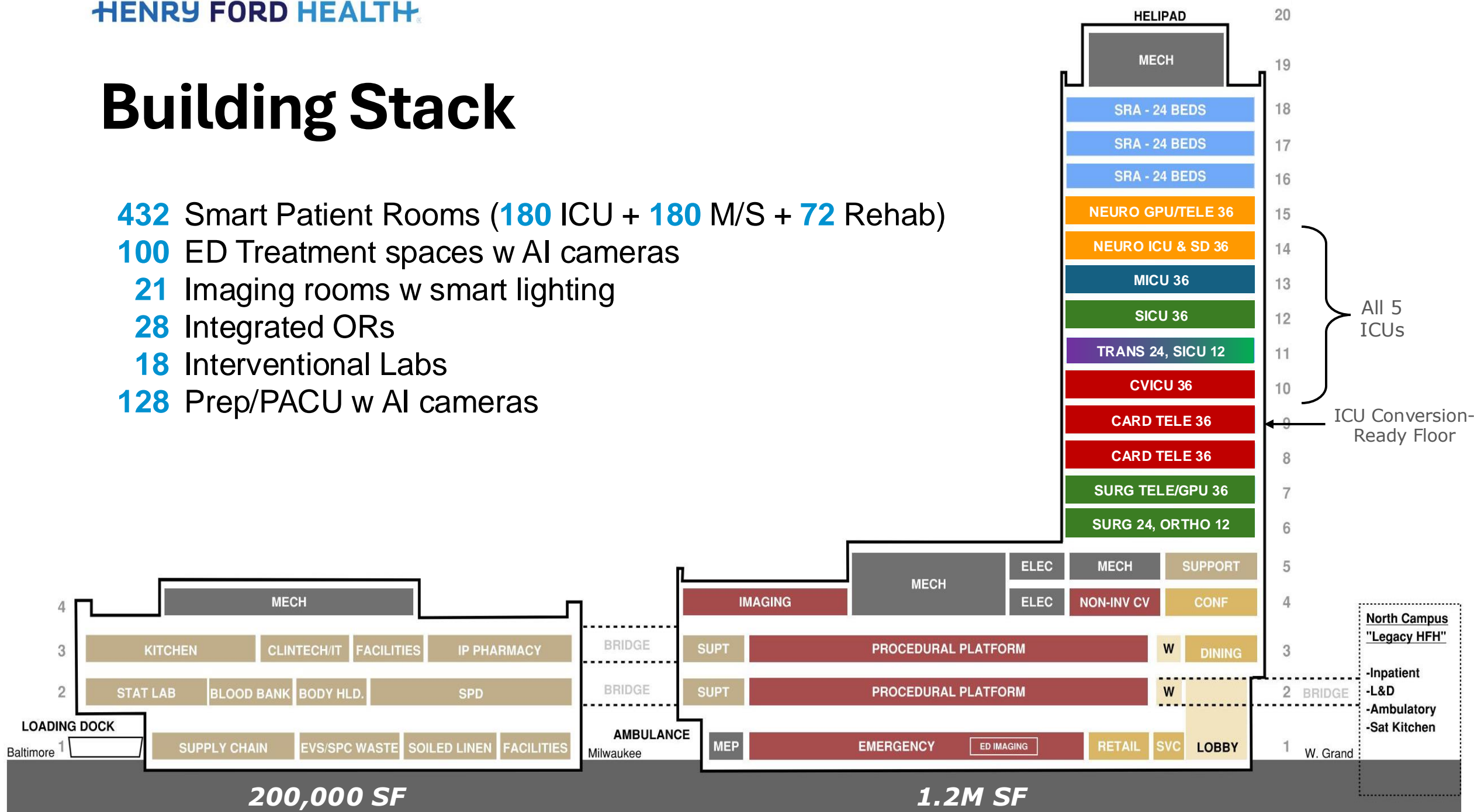
11'x150' caissons
65,000 lb re-steel cage



10' long, 520 lb carriage bolts

Building Stack

- 432** Smart Patient Rooms (**180** ICU + **180** M/S + **72** Rehab)
- 100** ED Treatment spaces w AI cameras
- 21** Imaging rooms w smart lighting
- 28** Integrated ORs
- 18** Interventional Labs
- 128** Prep/PACU w AI cameras



200,000 SF

1.2M SF

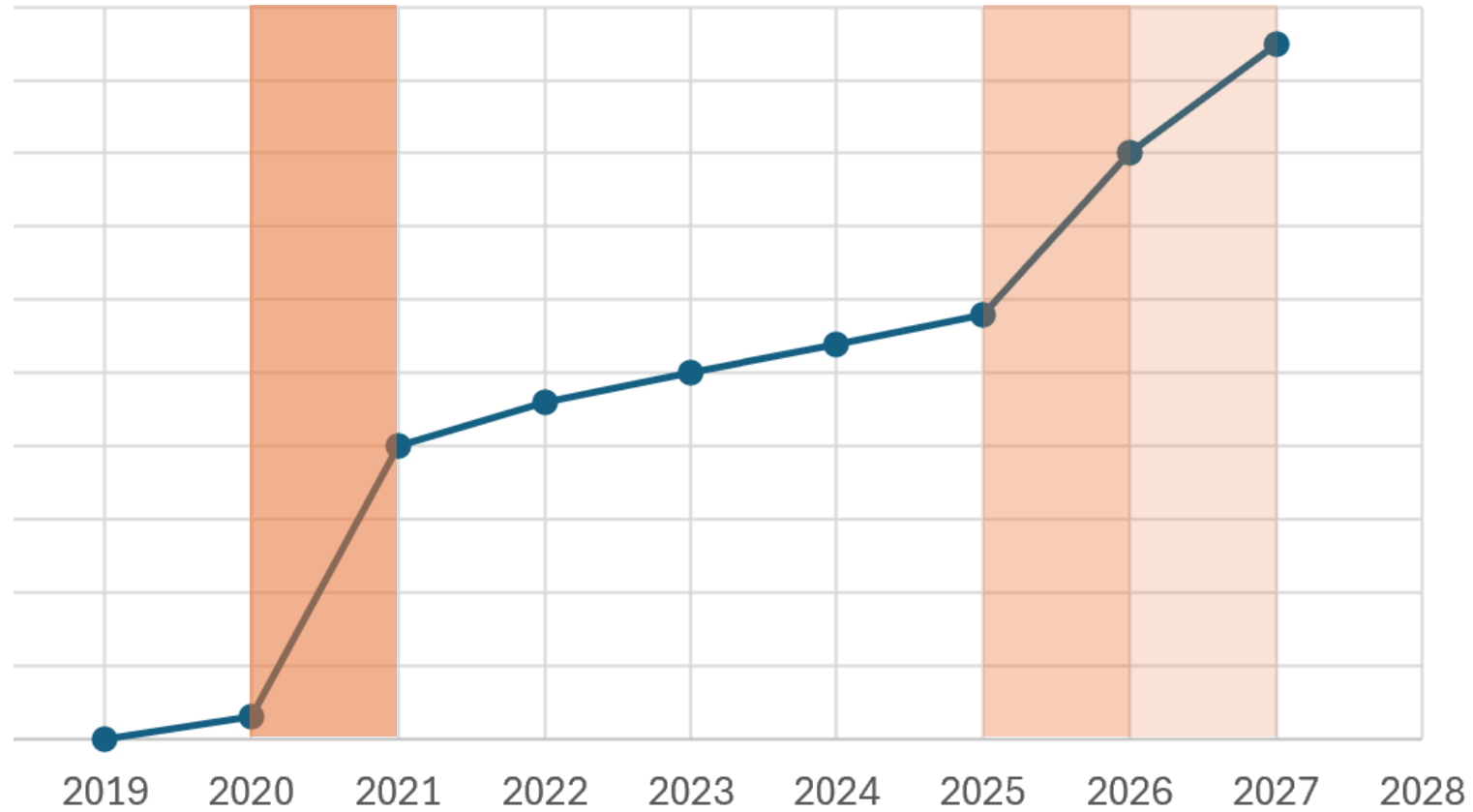
North Campus
"Legacy HFH"
-Inpatient
-L&D
-Ambulatory
-Sat Kitchen

Why Smart Hospital Spaces?

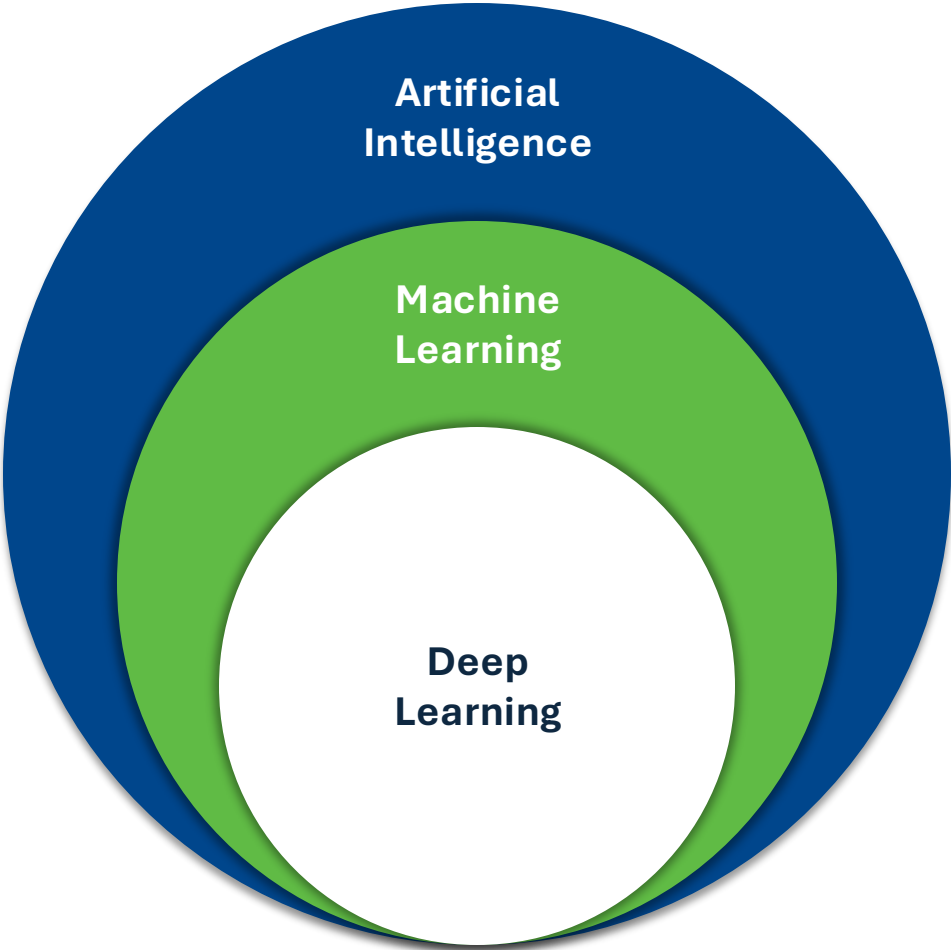
- Staff safety
- Improved patient experience
- Better patient outcomes
- Staff shortages
- Changing healthcare finances



Healthcare Smart Technology Adoption



Smart Patient Spaces: AI Learning Types



Smart Patient Spaces: AI Learning Models

AI: If, then



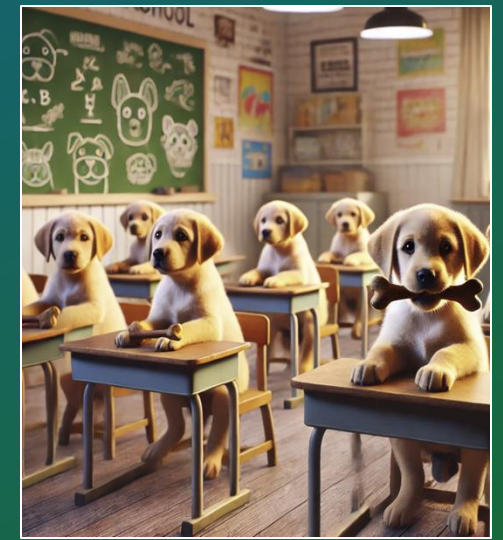
AI: If, then



AI: Machine Learning
Learn From Experience



AI: ML: Deep Learning
Neural Network w Large Data



**“ create a timeline for AI
for a technology conference
with 5 key people ”**

“create a timeline for AI for a **technology** conference with 5 key people”

Joseph Weizenbaum created ELIZA, one of the first AI programs, which simulated a conversation with a psychotherapist, marking an important step in human-computer interaction.

Geoffrey Hinton, along with his colleagues, introduced deep learning techniques to image recognition, achieving major improvements in AI with the ImageNet competition. This laid the foundation for many modern AI applications in vision and speech recognition.

1956



1965



1997



2012



2023



John McCarthy, a computer scientist, coined the term “Artificial Intelligence” and organized the Dartmouth Conference, which is considered the official birth of the AI field.

IBM's Deep Blue, powered by AI algorithms, defeated world chess champion **Garry Kasparov**, a significant milestone in AI's ability to compete in complex games.

Sam Altman, as CEO of OpenAI, led the release of ChatGPT, a powerful language model that advanced conversational AI, enabling people to interact with AI in ways never seen before. ChatGPT has become a symbol of AI's potential in real-world applications

“create a timeline for AI for a **women's nursing** conference with 5 key people”

Dr. Barzilay, a professor at MIT, began applying AI to medical imaging, focusing on using machine learning techniques for cancer detection. Her research set the stage for using AI to interpret medical images, significantly advancing AI's role in diagnostic medicine.

Dr. Murphy, a robotics expert, led research into AI-assisted robots designed to help nurses with various tasks like patient care and monitoring. This breakthrough allowed nurses to focus on more critical care while robots handled routine tasks, helping to reduce burnout and improve care delivery.

1956



1990s



2014



2018



2023



While **Ada Lovelace** did not directly work on AI, her foundational work in computing and algorithms paved the way for later developments. She is often considered the first computer programmer and an inspiration for later work in the AI field.

Dr. Watson, a nurse researcher, helped develop early AI tools that use predictive analytics to identify patients at risk of sepsis. This work highlighted the growing role of AI in improving patient outcomes by assisting nurses in identifying critical issues early.

Dr. Brennan, a nurse and researcher, helped pioneer the development of virtual nursing assistants powered by AI. Her work has focused on leveraging AI to provide personalized care advice and enhance patient communication, making healthcare more accessible and efficient.

“create a timeline for AI for a **high school** conference with 5 key people”

Garry Kasparov, the world chess champion, was famously defeated by IBM’s AI-powered computer, Deep Blue, in a highly publicized match. This event showed the world AI’s potential in mastering complex tasks and sparked global interest in the field.

Ilya Sutskever, a key figure at Google’s AI team, helped develop Neural Machine Translation (NMT), a deep learning-based system that significantly improved the accuracy of language translation. This advancement made AI more accessible and impactful in global communication.

1956



1997



2012



2016



2022



John McCarthy, a computer scientist, coined the term “Artificial Intelligence” and is credited with founding the field at the Dartmouth Conference. This conference marked the official beginning of AI as a discipline.

Geoffrey Hinton, along with his colleagues, achieved a major breakthrough in AI through deep learning techniques that improved image recognition. Their work in the ImageNet competition revolutionized computer vision and set the foundation for modern AI technologies.

Sam Altman, CEO of OpenAI, led the launch of ChatGPT, a highly advanced AI language model. ChatGPT’s ability to hold human-like conversations and assist with tasks from homework to creative writing made AI mainstream and accessible to students worldwide, demonstrating AI’s potential for personal use and learning.

“can you provide pictures of these key people”

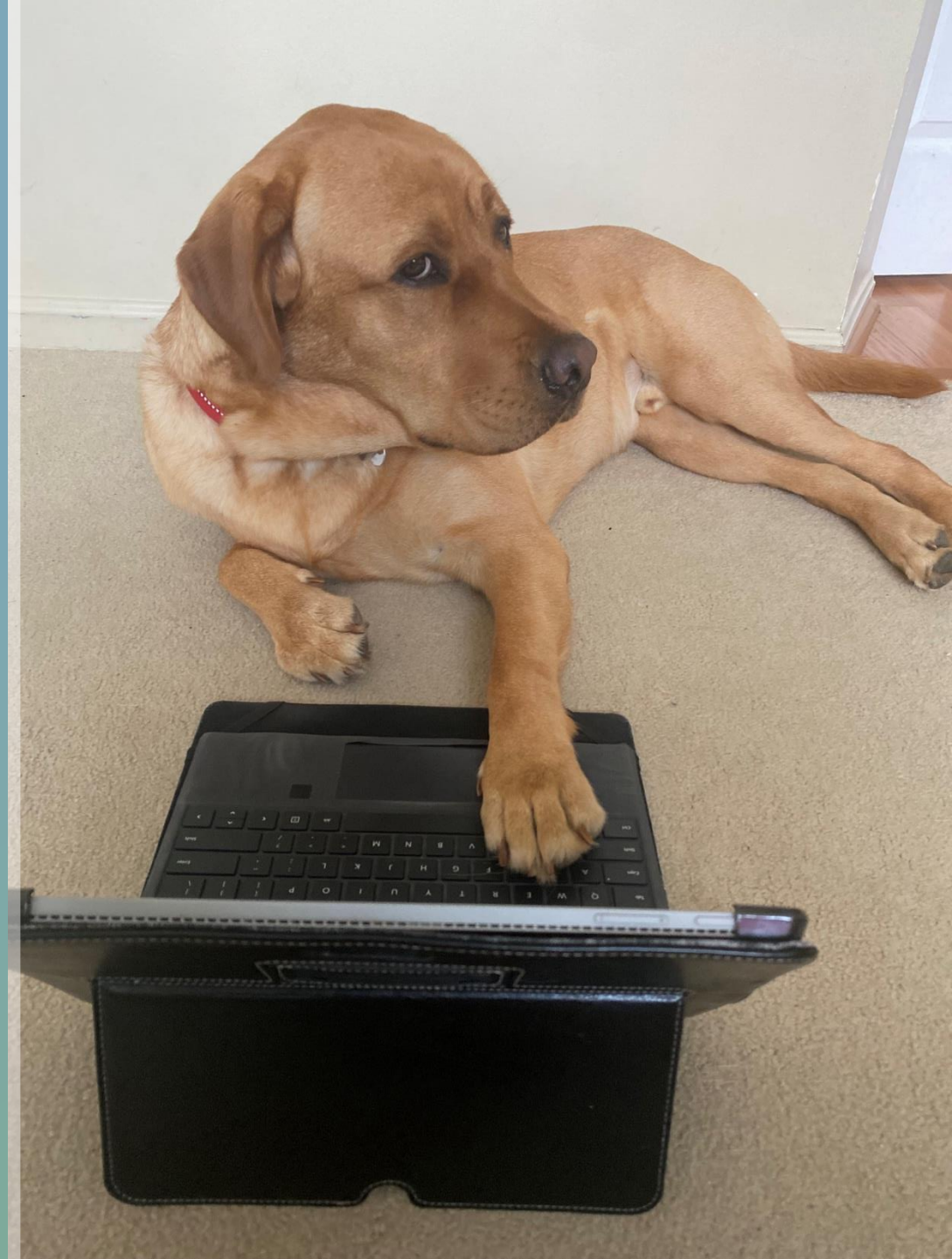
- somewhat serious expression
- thoughtful demeanor
- distinguished academic looks
- expression is usually thoughtful or serious, typical of an academic professional
- focused or neutral
- well-groomed appearance

- friendly expression
- elegant
- she appears thoughtful
- styled simply
- approachable and warm
- thoughtful or engaged expression

Let's get to work!

- Prompt ADD:
 - “Before responding, what questions do you have?”
 - “Did you do research or use sources?”

Data Governance Strategy



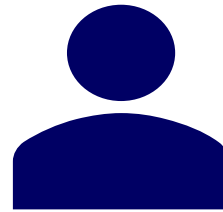
Smart Patient Spaces: HFH Key Technology Themes



Health Equity



Improved Clinical
Workflows



Smart Patient
Experience

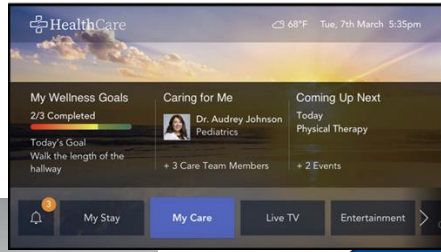


Enhanced
Security



AI Automation

Integrated Smart Patient Spaces



ED Track Board (External Washington Hospital Emergency Department) - Last Refresh Time: 8/25/2017 12:54 PM

Bed #	Room	Ward	Admission	Discharge	Transfer	Admission	Discharge	Transfer	Admission	Discharge	Transfer	Admission	Discharge	Transfer	Admission	Discharge	Transfer	Admission	Discharge	Transfer
05	E	05	05	05	05	05	05	05	05	05	05	05	05	05	05	05	05	05	05	05
06	E	06	06	06	06	06	06	06	06	06	06	06	06	06	06	06	06	06	06	06
07	E	07	07	07	07	07	07	07	07	07	07	07	07	07	07	07	07	07	07	07
08	E	08	08	08	08	08	08	08	08	08	08	08	08	08	08	08	08	08	08	08
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11	E	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
12	E	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
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30	E	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30



Smart Patient Rooms

- Ambient voice
- AI cameras (virtual nursing)
- Real time locating systems (RTLS)
- Digital door displays
- Patient entertainment displays
 - ➔ 75" touchscreen
- Patient and family room controls
 - Temperature
 - Lighting
 - Nurse call
 - Food order

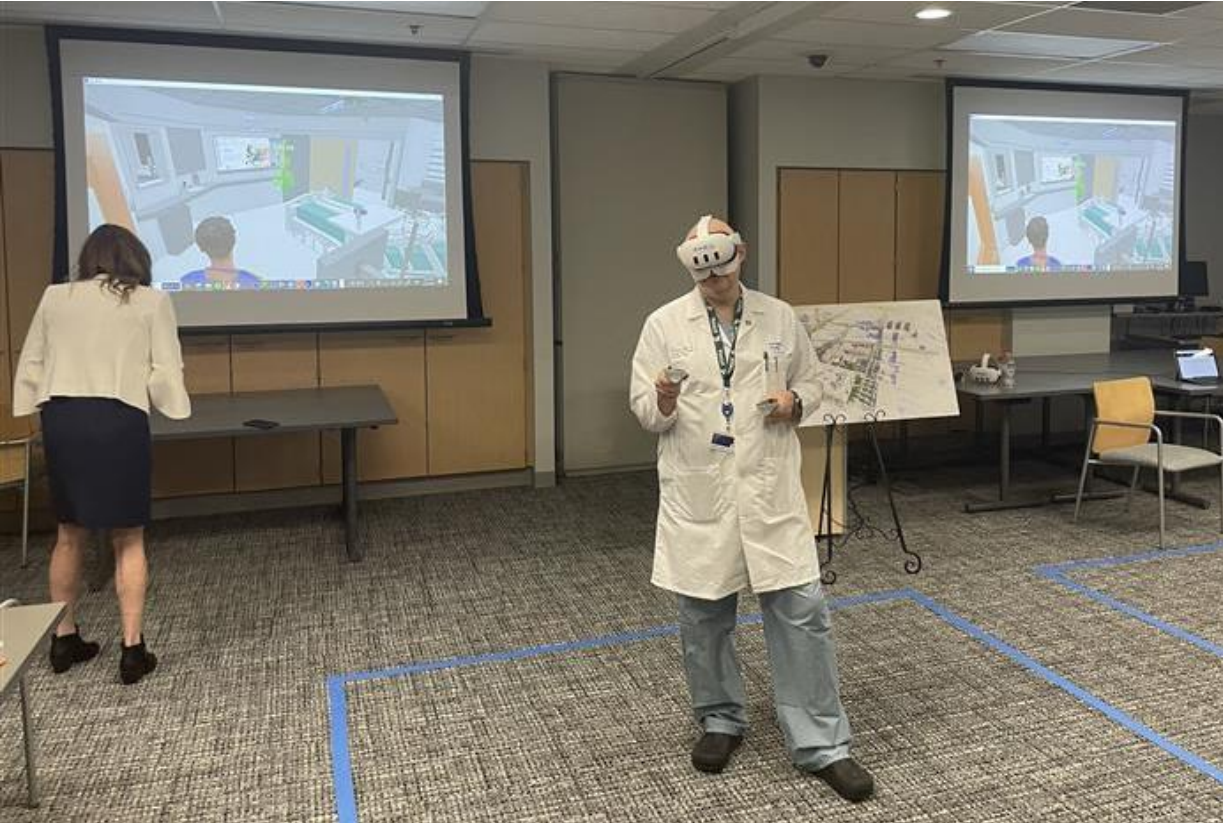


Smart Patient Spaces: Design Considerations

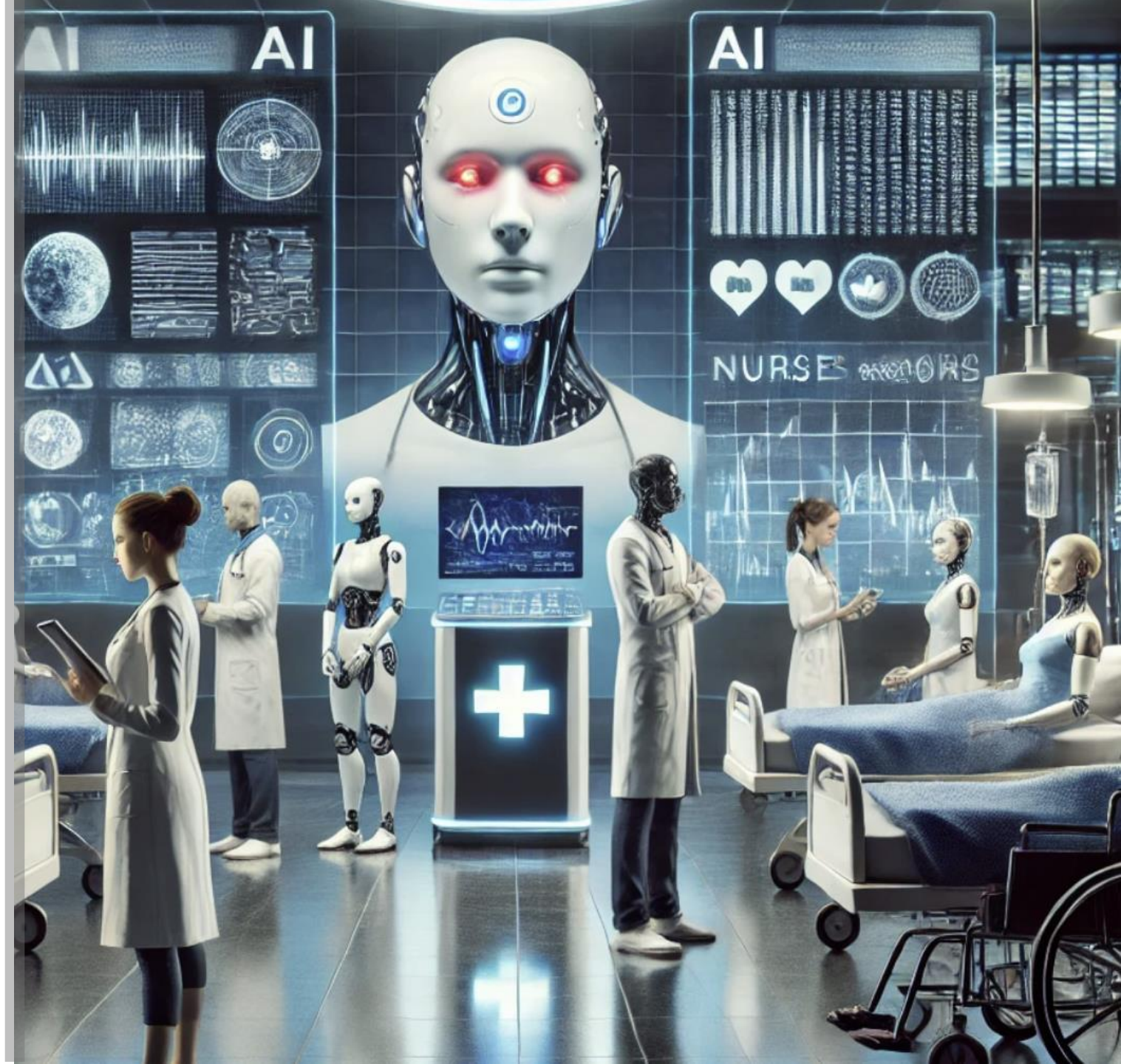
- Architecture layouts
- Footwall spacing
- Patient room displays
- Security
- Audio-visual systems
- Use case requirements



Smart Patient Spaces: VR/AI Design Utilization



Smart Hospital Spaces Q&A: Risks and Rewards



Smart Hospital Spaces Q&A: Health Equity Considerations

