

Artificial Intelligence & Applications in Healthcare

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Houston Methodist Hospitals

Houston Methodist Hospital



Opened in 1919

Houston Methodist Baytown



Added in 1983

Houston Methodist Sugar Land



Opened in 1998

Houston Methodist Willowbrook



Opened in 2000

Houston Methodist West



Opened in 2010

Houston Methodist Clear Lake



Added in 2014

Houston Methodist Continuing Care



Opened in 2014

Houston Methodist The Woodlands



Opened in 2017

Leading Medicine: Values & Culture



Our Core Values
ICARE

*Integrity
Compassion
Accountability
Respect
Excellence*

FACILITIES AND CAPACITY

Houston Methodist is a faith-based, academic medical center comprised of 8 hospitals,

1 academic medical center

6 community hospitals

1 long-term acute care hospital

2,711 operating beds

PHYSICIANS AND STAFF



32,000+

Employees



1,215+

Employed Physicians
+ 5,069 Affiliated Physicians



PATIENT ENCOUNTERS

In 2023, Houston Methodist had

138,000+ HOSPITAL ADMISSIONS

2,091,200+ OUTPATIENT VISITS

2,046,600+ CLINIC VISITS

RECOGNITION AND ACCOLADES



RESEARCH, EDUCATION AND GIVING



\$299 MILLION
research and
education funding



71
ACGME residency
training programs



WEILL CORNELL
Medical School
affiliation



ENMED PROGRAM
partnership with
Texas A&M

More than **\$1 BILLION** in charity care and community benefits

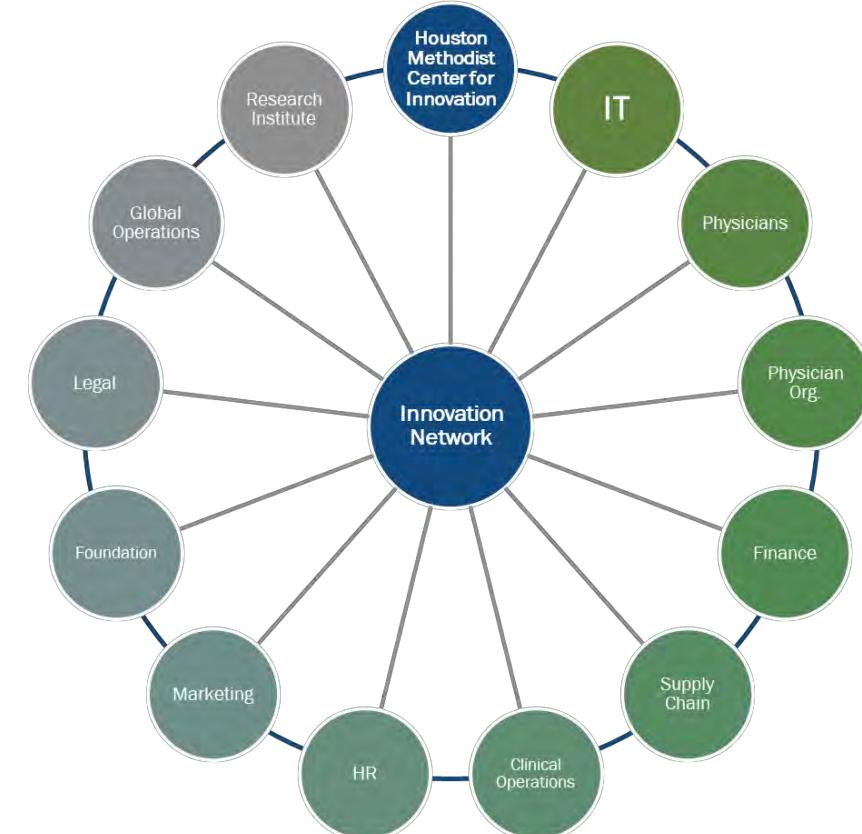


THE VISION FOR THE SECOND CENTURY

Houston Methodist will set a new standard for leading academic medical centers through unparalleled safety, quality, service **AND** innovation.

Center for Innovation is Part of a Larger Innovation Network

Digital
Innovation
Obsessed
People



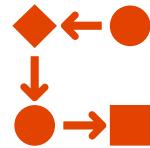
What is Houston Methodist's approach to innovation?

Center for Innovation Principles



EVERYONE'S RESPONSIBILITY

Innovation is everyone's job and responsibility.



TRANSFORMATIVE

Focus on initiatives that will transform the way you do business.



RESEARCH & DEVELOPMENT

Embrace new technologies and new ideas.



AGILE

Succeed fast or fail fast.

Center for Innovation Steering Committee Responsibilities

Governance Structure



CFI Steering Committee (DIOP) Responsibilities:

- Approvals
- Funding source
- Accelerator + speed (resources)
- Strategic vision
- Finding products and building partnerships

Center for Innovation Approach

What does success look like?

How long will the pilot take place?

ROI? How much would it take to implement at scale?



Pilot



Family Review

Do we have the right partner / solution?



Success

Graduate

Who will manage?

How will we improve?

Fail

Rest in Peace

What did we learn?

How can we make sure not to repeat the same mistakes?



Goals to Achieve

Hard savings

Actual FTEs that we can eliminate from the organization without compromising any functionality of the organization.

Changing Ratios

LOS savings

Sustainability as the **true** target

Language of cost savings

Soft savings

Improvements that can be made to the workforce or the functions but may come in addition or instead of actual changes in FTE.

Value savings

PIPELINE

SMALL ROLLOUT

AVAILABLE NOW

AI POWERED
SCRIBE

ADMITTED
PATIENT
TRACKING

PATIENT
ENGAGEMENT TVs

VIRTUAL REALITY

CONTRACT LABOR
STANDARDIZATION

PIECES

SMARTER DX

INNOVATION

SYLLABLE

CARE.AI

HDAI

CARESENSE

INPATIENT
TEXTING

APELLA

BIOBUTTON

AMAZON GO

WELL

INTELLIGENT
LOCATIONS

ARTERA

TELENURSING

ROBOEATZ

Smart Hospital DNA

Innovation Vision



Technology Bets



Innovation Centric Design



Partner Ecosystem



Innovation Infrastructure



Technology Selection Process



Smart Hospital of Future Bets



Self Control Scheduling



Self Control Check-in



Clinical & Financial Knowledge



No Call Center Agents



Phygital



Smart Room



Voice over Type



Predictive and Proactive AI



Ambient Intelligence



Service Robotics



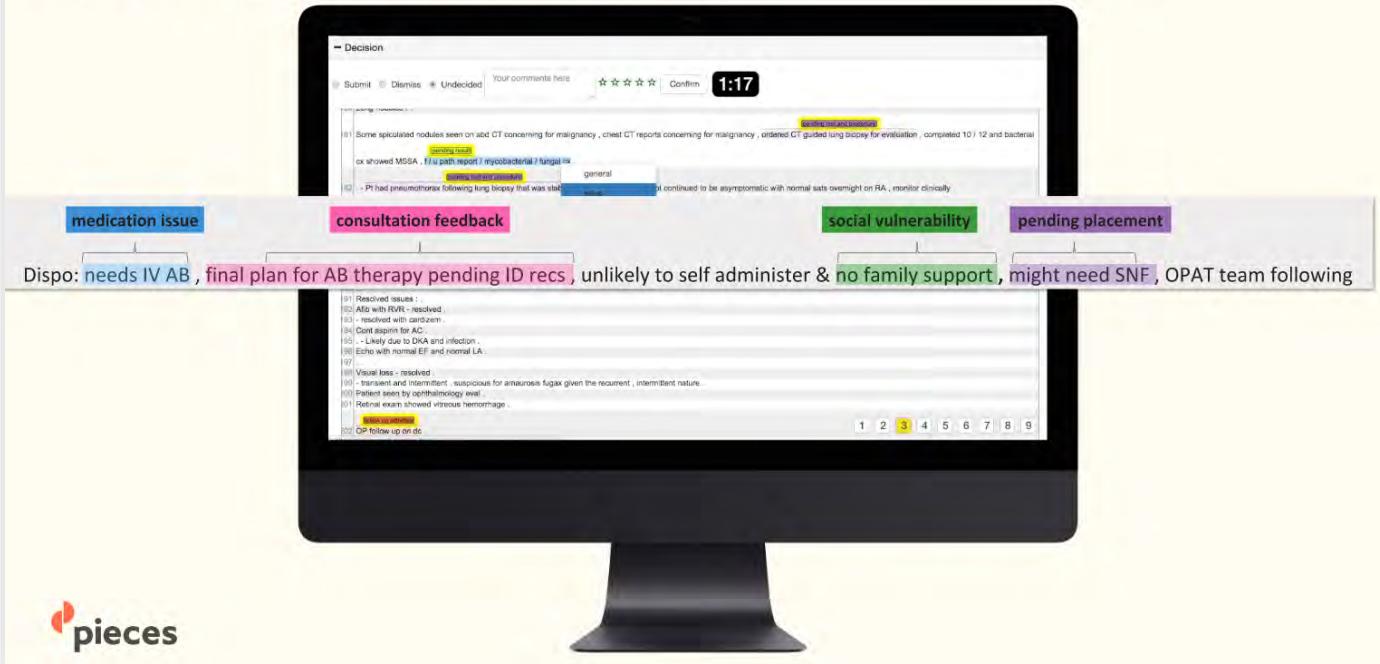
Remote Monitoring of Patients



Multi-modal Education

Pieces Predict reads notes in Epic

How We Are Different: Pieces surfaces social determinants directly from doctor's and nurse's notes for SDOH longitudinal care and interventions.



Pieces: Patient Summary/Overview

The pieces summary takes structured and unstructured data from the patient chart and consolidates pages of information into one actionable sentence, which allows physicians and care providers to quickly get up to speed on a patient.

Demographic Data **Past Medical History** **Current Length of Stay** **Reason for Admission**

Kayla Thomsen is a 44 yo caucasian female with HTN and DM admitted 7 days ago for NSTEMI, s/p left heart catheterization with PCI to LAD with stent, s/p intra-aortic balloon pump. Course complicated by extraperitoneal bleed, cardiogenic shock, s/p femoral artery repair. Pieces

Major Procedures

Unplanned Events

Predicted Discharge Date **Readmission Risk**

predicts discharge in 1-2 days; readmission risk may be high.

reLOS AI Patient List

pieces Predict

User Manager Insights Metrics ReLOS Patient List Archives COVID-19 Patient Registry Sepsis Patient Registry LOS Me

Filters [Clear all](#) [Clear](#) [View As:](#) Case Manager/Social Worker Universal My List

	MRN	Name	LOS	Location	Estimated Discharge Date	Pieces For You	Admission Date
★	2b158c0332	Aguas, Brett	8	HOSP1, UNIT1	10-03-2020	Low	09-30-2020
★	ffd1d2da3f	Athearn, Lisa	7	HOSP1, UNIT1	10-04-2020	Low	10-02-2020
★	bdb6e74dd4	Beckman, Karen	14	HOSP2, UNIT3	09-27-2020	Low	09-26-2020
★	dcdf1db935	Bennett, Teresa	9	HOSP2, UNIT2	10-03-2020	Low	09-27-2020
★	d39e49a3a9	Benninger, Troy	7	HOSP2, UNIT2	10-03-2020	Low	10-01-2020

Quickly view a patient's top three barriers for immediate action.

Discharge Barriers

Consultation Feedback | Author: Freeland, Ricky, Registered Nurse
Note Excerpt: "Yes, will consult case management." [Select Action](#)

Consultation Feedback | Author: Holden, Chad, Registered Nurse
Note Excerpt: "Pt awaiting ortho consult tomorrow from Dr. " [Select Action](#)

Pending Test And Procedure | Author: Holden, Chad, Registered Nurse
Note Excerpt: "Possibly surgery on Friday." [Select Action](#)

Pieces Note Interpretation: Patient presents with necrosis of the left talus; Clinically stable; Low likelihood of discharge; Disposition pending surgery on Friday.

Natural Language Generation is used to present patient clinical and potential barrier synopsis.

Leveraging Big Data



Access to **22 years of Medicare FFS** and **4 years of MA data** from **100 million Medicare beneficiaries**



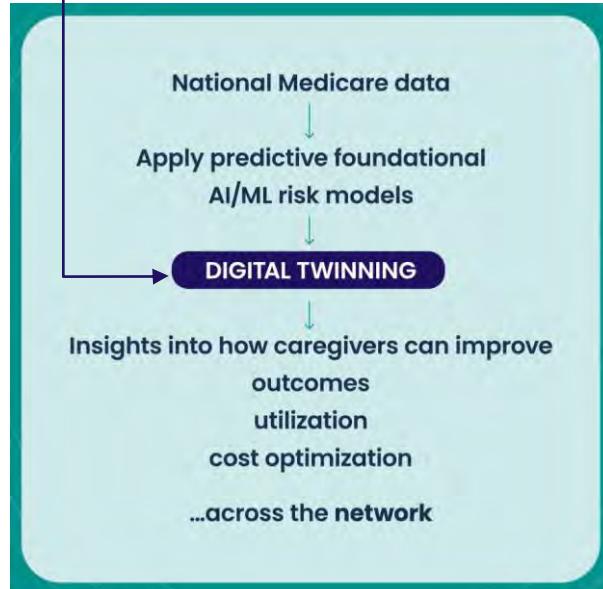
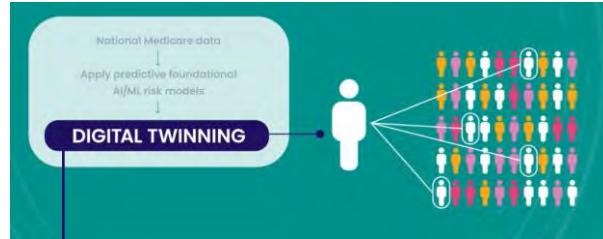
Compares Houston Methodist to other similar Academic Medical Centers



Predictive analytics capabilities guide actions to improve patient care



Focus on **post-discharge care** is enhanced; extends view **outside of the walls of the hospital**



HDAI: What is it?

Health Data Analytics Institute



Access to **22 years of Medicare FFS and 4 years of MA data**
Data from **100 million Medicare beneficiaries**



Compares Houston Methodist to **other similar Academic Medical Centers**



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Focus on **post-discharge care** is enhanced; extends view outside of the walls of the hospital

Leveraging the Power of Data and Analytics with Physicians

Cardiology/Cardiovascular Surgery

Improve performance on 30-day post-admission mortality

Orthopedics

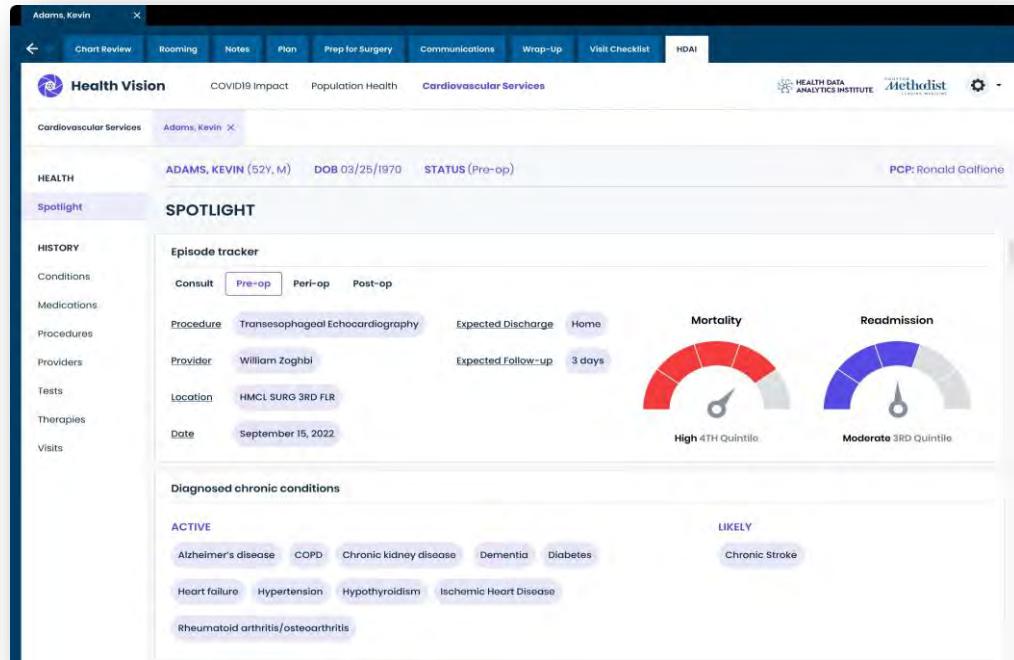
Shared decision-making conversations with patients at high risk of mortality about appropriateness of elective procedure vs. other options

Pre-Op Optimization

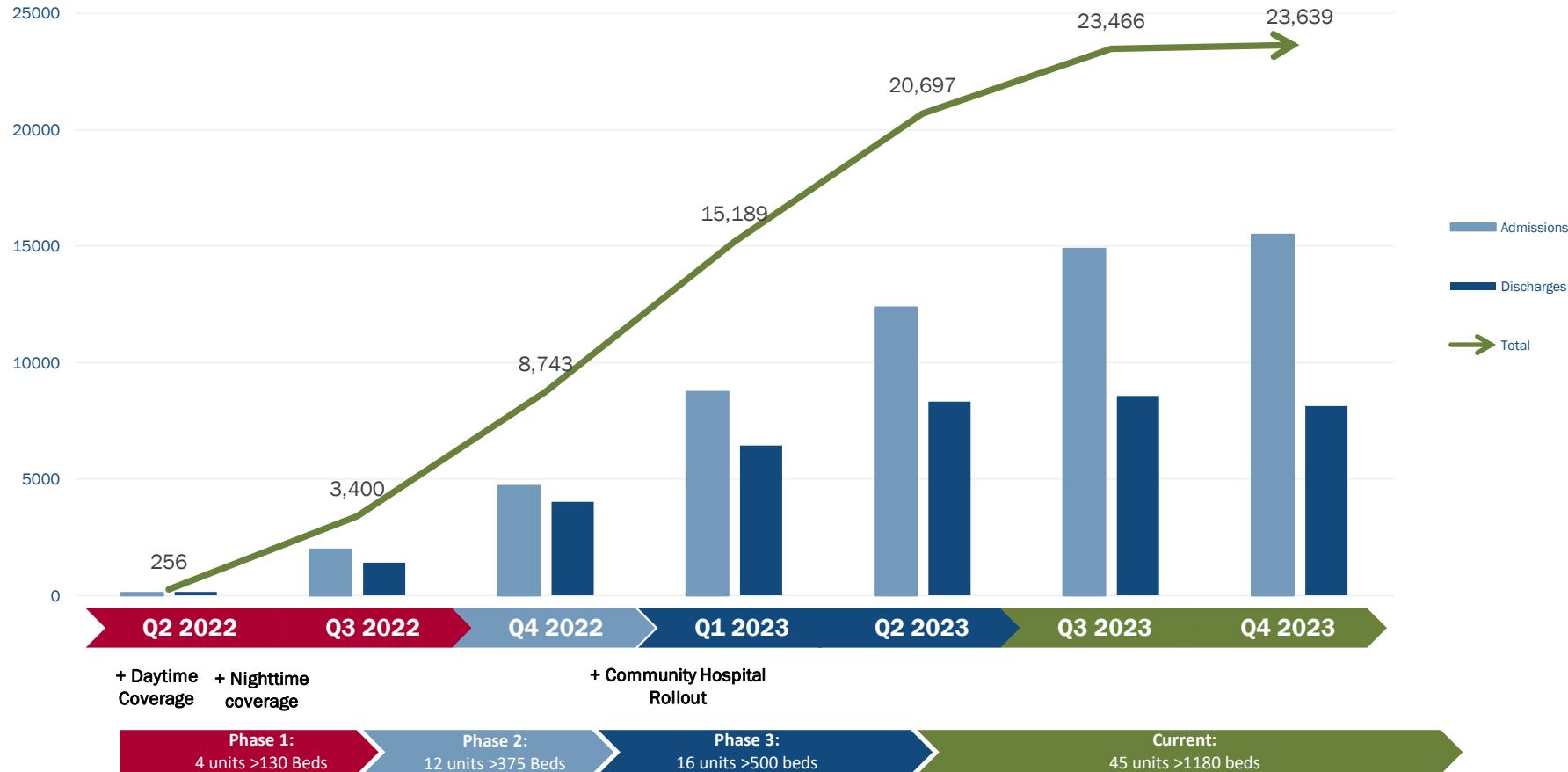
Data-driven care planning assistance for multispecialty pre-op teams to identify and act upon potential ICU/hospital-related adverse events

HMCC ACO

Improve the efficiency of the discharge planning process for inpatient and outpatient care managers



Success: Volume



Success: Operational Metrics

⬆️ Better

↔️ Flat/Neutral

⬇️ Worse

*Directly tied to use case

Metric		Outcome
Patient Experience	HCAHPS Scores - Overall Rating of Hospital*	⬆️
	HCAHPS Score – Discharge*	⬆️⬆️
Throughput/LOS	Discharge before 2PM*	↔️
	Average LOS*	⬆️
	Discharge Order to Actual Discharge Time (Hours)*	⬆️
Other Clinical	Malnutrition Screening*	⬆️⬆️
	Completion of EPIC admission profile*	⬆️⬆️
	CAUTIs/CLABSI	↔️
	Falls (w/injury)	⬇️
Staffing	Overtime	⬇️
	Turnover	↔️
	Nursing Ratios*	⬆️

BioButton for Vital Signs

Current state bedside vitals



BioButton Data



	Resting HR
	Resting RR
	Skin Temperature
	Activity

	Sleep/hr
	Sleep/day
	Device On/Off Body



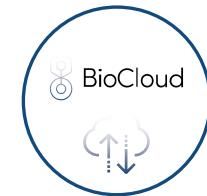
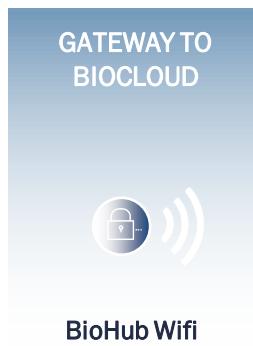
Wearable BioButton

BioButton: Acute Care

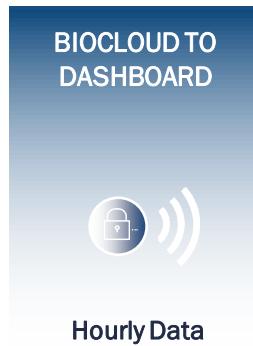
Data Measurement and Transmission Frequency



Minute level Skin Temperature, Resting Heart Rate, and Resting Respiratory Rate Readings



Sleep, activity level, & on/off body derived through BioCloud algorithms



Data Visualization

Epic

AlertWatch



Single patient view in Epic - Future

Central Monitoring – Future
(Virtual Operations Center)



vICU Program

Physician Support (vMD)

- Experienced intensivist physician team available for immediate consultation
- Can assist with management- codes, admits, calls
- Works collaboratively with bedside team
- Plan of care support



Nursing Support (vRN)

- Experienced critical care nurses
- Facilitate video connections and conversations
- Support shift transitions & staff interaction and communication

Monitoring

- Software: consolidates data from bedside & EMR
- Extra set of eyes- vRNs review monitoring info and communicate alerts/trends to bedside team/vMDs
- Algorithms and predictive analytics
- Data collection tool

BioDashboard

Status Filter: Active, Data Within 24 hours														
Not Set [14]		Alerts				Expanded Grid				Search				
HMH Walter 17	Duration: 17 hr	Name Hidden	Age: 73	Last Data: 16 hours	HMH WT17 1729	Duration: 1 hr	Name Hidden	Age: 33	Last Data: 26 hours	HMH WT17 1737	Duration: 8 hr	Name Hidden	Age: 54	Last Data: 16 hours
34.4°C	HR: 48	RR: 15	34.6°C	HR: 107	RR: 21	35.3°C	HR: 100	RR: 18	33°C	HR: 74	RR: 17	31°C	HR: 82	RR: 11
HMH WT17 1731	Duration: 2 hr	Name Hidden	Age: 66	Last Data: 25 hours	HMH WT17 1723	Duration: 1 hr	Name Hidden	Age: 70	Last Data: 22.5 hours	HMH WT17 1703	Duration: 9 hr	Name Hidden	Age: 46	Last Data: 25 hours
34.1°C	HR: 103	RR: 16	35.1°C	HR: 72	RR: 22	33.7°C	HR: 102	RR: 19	34.1°C	HR: 77	RR: 17	31.1°C	HR: 70	RR: 17
Floor is empty														
Monitor is empty														
Telemetry is empty														
SNF is empty														
Home is empty														
Discharged [14]	Duration: 23 hr	Name Hidden	Age: 70	Last Data: 16 hours	HMH WT17 1734	Duration: 15 hr	Name Hidden	Age: 71	Last Data: 16 hours	HMH WT17 1733	Duration: 23 hr	Name Hidden	Age: 43	Last Data: 16 hours
	36.1°C	HR: 56	RR: 26	34.5°C	HR: 81	RR: 14	32°F	HR: 64	RR: 16	33.2°C	HR: 63	RR: 13	35.4°C	HR: 89
HMH WT17 1705	Duration: 2 hr	Name Hidden	Age: 49	Last Data: 7.5 hours	HMH WT17 1702	Duration: 2 hr	Name Hidden	Age: 54	Last Data: 5.6 hours	HMH WT17 1701	Duration: 2 hr	Name Hidden	Age: 70	Last Data: 6.6 hours
33.8°C	HR: 93	RR: 17	31.4°C	HR: 54	RR: 20	31.5°C	HR: 60	RR: 20	34.5°C	HR: 60	RR: 22	31.2°C	HR: 86	RR: 14
Not Set [14]	Duration: 1 hr	Name Hidden	Age: 55	Last Data: 23.5 hours	HMH WT17 1726	Duration: 2 hr	Name Hidden	Age: 75	Last Data: 23.5 hours	HMH WT17 1725	Duration: 1 hr	Name Hidden	Age: 25	Last Data: 7.6 hours
	34.3°C	HR: 90	RR: 16	35.6°C	HR: 87	RR: 13	33°C	HR: 73	RR: 13	33.9°C	HR: 60	RR: 19	35.8°C	HR: 68
Grouping by Location														
(Click for icon legend descriptions)														

BioDashboard – Single Patient View

Active Alerts

2 coughing episodes detected in previous 24 hours.

Procedure: None

Name Hidden

Sex: F

Age: 42 years

Diagnosis: None



33.4 °C
[3hr]



No Data

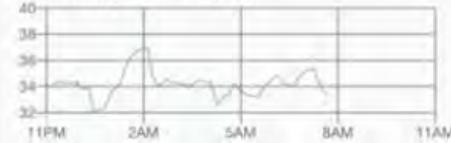
Normal

Marginal

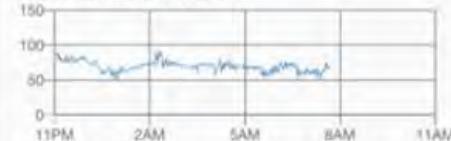
Abnormal

12 hours 24 hours 3 days 7 days 30 days

Skin Temperature (°C)



Heart Rate at Rest



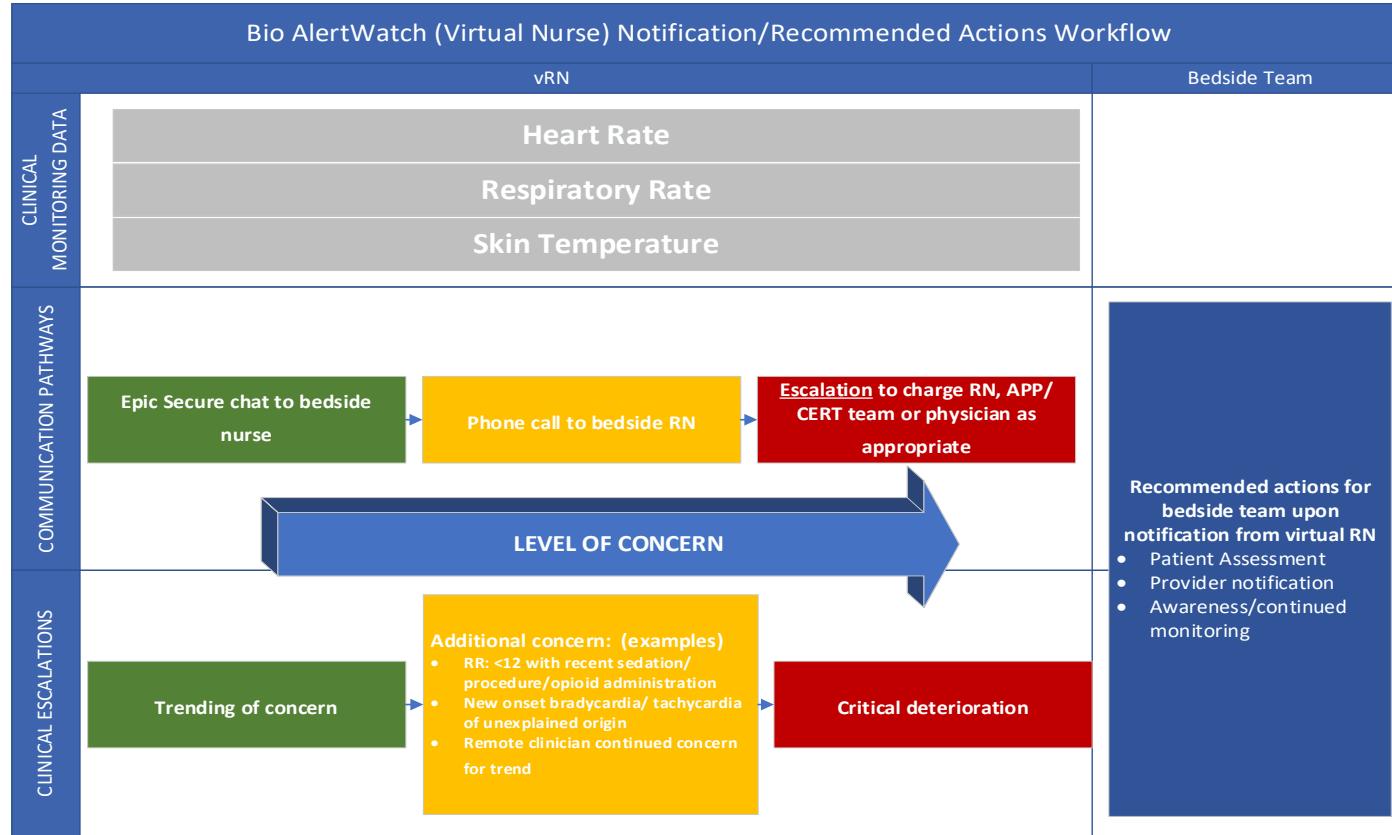
Respiratory Rate at Rest



No Risk

Organ at Risk

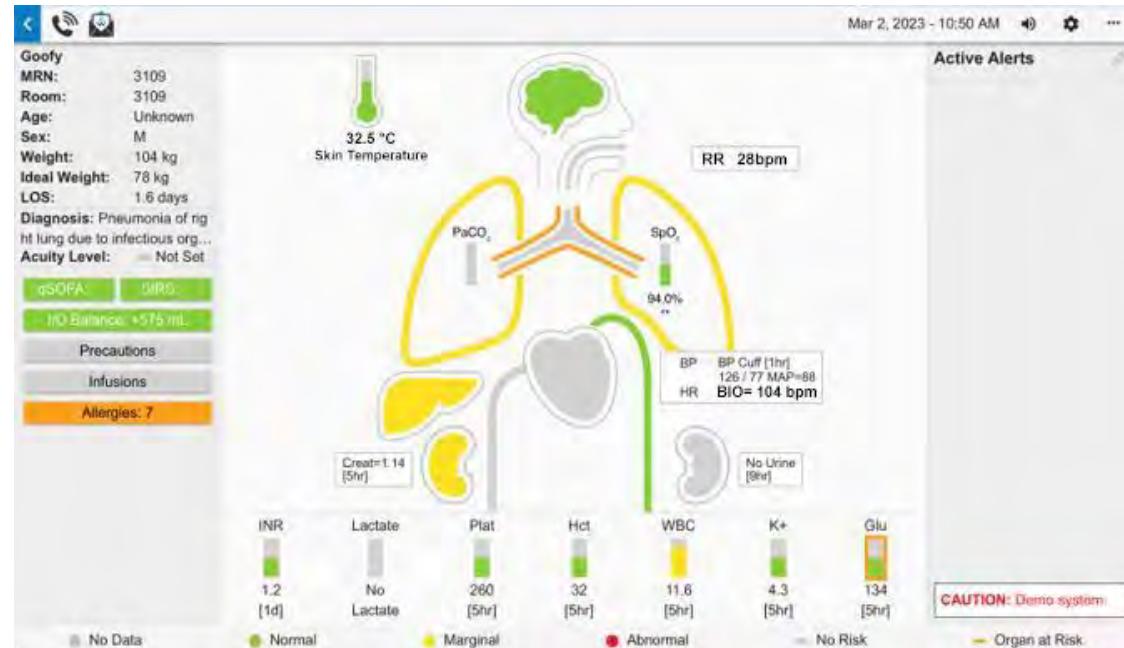
Alert Escalation Protocol



BioDashboard – Expanded Alerts

Additional Context for Accelerated Patient Review

- Patient demographics
- Inpatient vitals
- Lab results
- ICD-10 codes
- Infusions & medications
- LDAs
- Nursing documentation
- Staffing schedules
- Comorbidities



BioDashboard – Expanded Alerts

Expanded analytics

- qSOFA
 - Systolic BP \leq 100
 - Respiratory rate \geq 22 bpm
 - Glasgow coma scale $<$ 15
- SIRS
 - Temperature $>$ 38 or $<$ 36, measured in the last day.
 - Heart rate $>$ 90, median over one hour.
 - Respiratory rate $>$ 20, median over one hour.
 - WBC $>$ 12 or $<$ 4, measured in the last day.

Default expanded alerts

- Potential sepsis
 - qSOFA is \geq 2
 - SOFA is \geq 2
 - Lactate is \geq 2
- Sepsis treatment (next page)
- Low / high BP
- Low SpO2
- Low urine output
- Quality of care / lab alerts

BioButton: Selected Great Catches

WT18

2/27/24 – Night Shift

- BioButton alerts remote monitoring team of high HR.
- Patient was sleeping, looked ok.
- Virtual RN requests double check, escalates to CERT NP.
- Floor RN and CERT NP find large volume of bloody fluid in suction cannister.
- Patient transferred to WT11 NICU and put on continued transfusions, fluids & pressors.

A8

01/04/24 – Day Shift

- Admission from the ED for hypotension and tachycardia
- Admitted to A8 on 1/2
- BioButton alerts of abnormal HR on 1/4
- Remote monitoring team escalates to RN and CERT NP.
- CERT NP evaluates patient and finds tachycardia and tachypnea present with decreased breath sounds.
- Patient transferred to CICU.

A8

12/16/23 – Night Shift

- BioButton alerts remote monitoring team of patient deterioration.
- Remote monitoring escalates to bedside RN and CERT NP.
- Patient visibly changed from baseline - is lethargic.
- CERT NP visits patient and finds patient hyperglycemic.
- CERT initiated and patient transferred to ICU.



care.ai Cameras in Patient Rooms

403 beds at HMH with wall-mounted cameras

Virtual Nursing & Virtual Monitoring

- Virtual Monitoring - Moving to fixed camera solutions installed in the patient room and deployment of care.ai R2 carts
- Virtual Nursing - admissions and discharges across the HM system via iPad and care.ai-installed patient rooms ()

Workstreams in Development

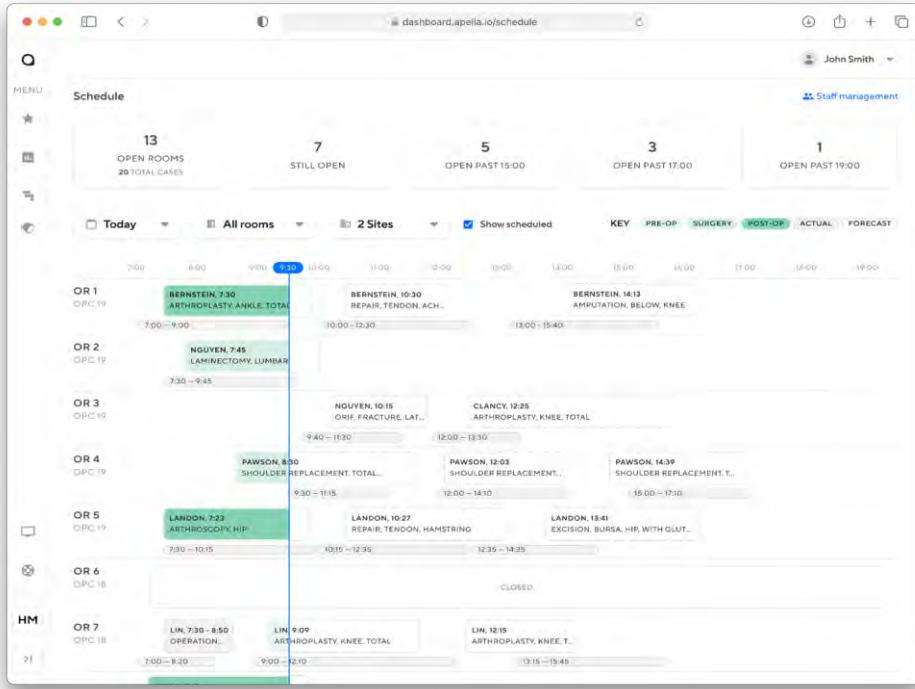
- Telepsych & Telestroke transitioning to care.ai
- Telepharmacy pilot on WT17 & WT18
- Epic Context Linking (drop-in video calls from patient chart)
- TeleRounding
- Dedicated ED Mobile cart for multi-use (e.g. Pharmacy, Hospitalists, Specialists, & Case Management)



care.ai™

R2 – 2-way video & audio camera that turns the TV into an environment where we can intervene with tele-sitter, tele-nurse, and tele-visits.

Predictive Capabilities



Apella is **24% better** than EHR at predicting case durations and the schedule **updates every minute**, autonomously.

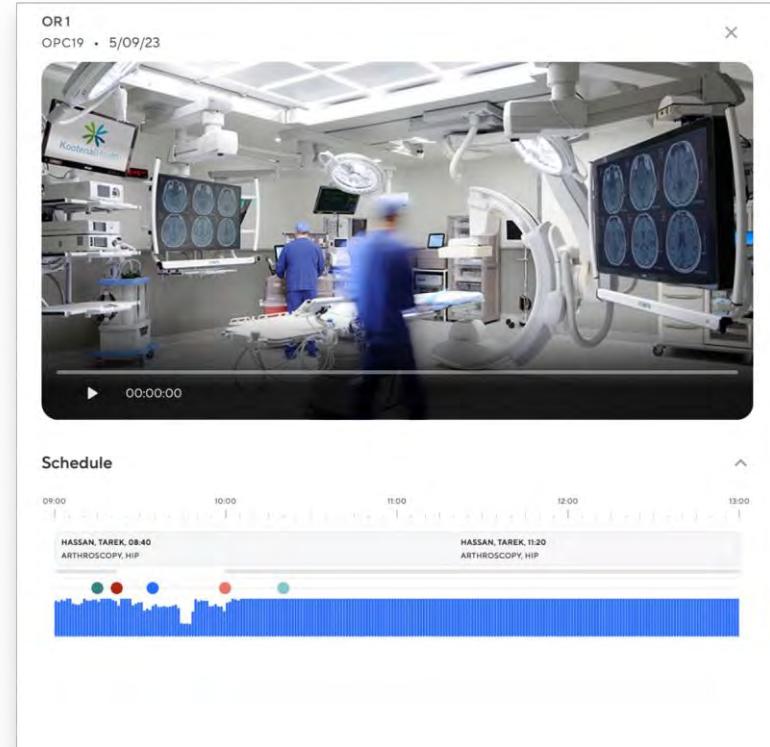
Event Accuracy

Computer vision

accurately identifies case events in real time.

Accuracy*

- Patient undraped **99.1%**
- Patient wheels out **99.7%**
- Back table open **99.5%**
- Patient wheels in **99.6%**
- Patient draped **98.9%**



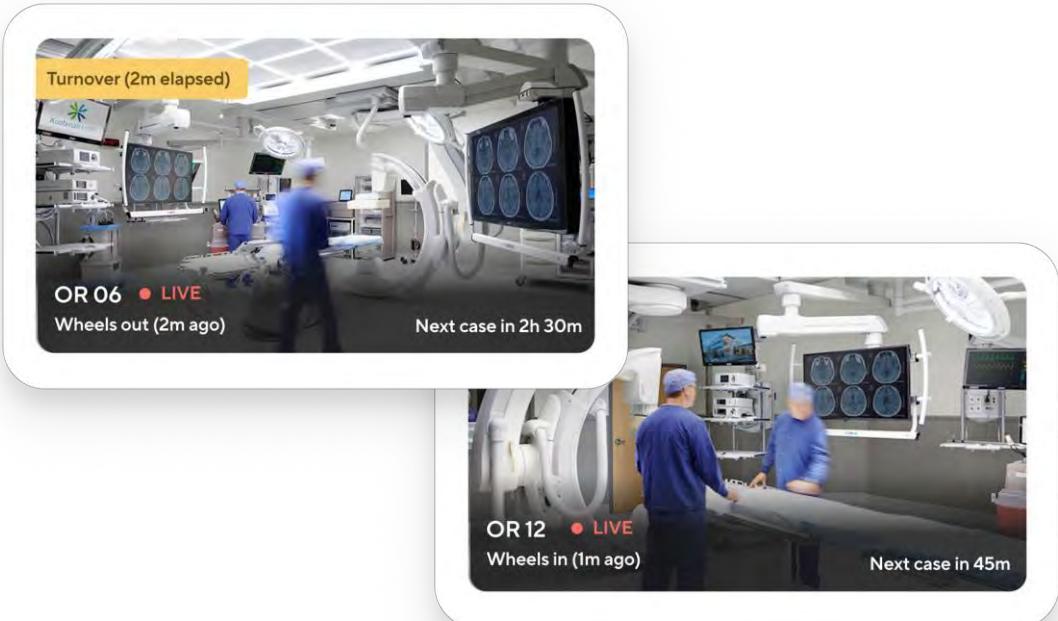
Human vs. Apella: Latency

Delayed data makes it harder to run an OR.
Apella collects the data we need, automatically.

A patient-first mindset is essential to great care, but it can lead to delayed data.

- 59% of **wheels-in** events are recorded **>10 mins late**
- 10% of **wheels-out** events are recorded **>10 mins late**

Apella is within 2 mins,
>99% of the time



Live Gallery and Coordination Dashboard

The Live Gallery helps the Board Runner/Charge RN identify where to intervene proactively.



Pre-op & PACU have access to the same event information as the OR.

Schedule OR PreOp PostOp

All rooms

14	0	8	6
TOTAL CASES	CASES COMPLETED	CASES IN PROGRESS	CASES NOT STARTED
14	0	8	6

Patient queue

Estimated start	Next case	Current case progress
10:00	DOCTOR, DONOR PROCUREMENT, ORGAN	Back table opened: 0h 21m ago OR 01 (WT03)
10:53	REARDON, MICHAEL REYES, MANUEL TAVR FOR SURGERY; CV TAVR FOR CARDIOLOGY	Pt draped (procedural): 0h 24m ago OR 15 (WT03)
11:00	BAVARE, CHARUDATTA ARTERIOPGRAM WITH ANGIOPLASTY, IF INDICATED	Idle OR 16 (WT03)
11:20	LE, LINDA CLOSURE, WOUND, ABDOMEN, SECONDARY FOR DEHECENCE	Back table opened: 0h 34m ago OR 10 (WT03)
12:00	CHAN, EDWARD LOBECTOMY, LUNG, ROBOT-ASSISTED, THORACOSCOPIC	Pt draped (procedural): 0h 39m ago OR 07 (WT03)
13:23	REARDON, MICHAEL REYES, MANUEL TAVR FOR SURGERY; CV TAVR FOR CARDIOLOGY	Pt draped (procedural): 0h 24m ago OR 15 (WT03)

Apella Outcomes



Made business critical data **accessible and usable** for stakeholders



Validated staffing allocation with measuring room utilization and case distribution



Allocated a **new 10-hour block** to a high utilization surgeon in OPC-19



Reduced turnover time in WTOR by 10%+



Access to curated video snips for **timely cleaning audits and procedure review**



Developed **predictive staffing tools** for the OR

Real Time Location Services (RTLS)

Asset management

Through tracking, identify underutilization of assets to optimize inventory/ capital spend in all departments

Admitted patient tracking

Keep patients from eloping or being left in a hallway unattended (epic)

Track transport times

Improve operating room workflow by tracking transport and wait times (epic)

Monitor call response time

Optimize staffing levels by improving productivity and patient flow (epic)



Digital wayfinding

Improve patient satisfaction and decrease visit no shows by enabling turn by turn navigation (convenient)

Hand hygiene compliance

Improve handwashing compliance and reduce HAC

Environmental monitoring

Utilize environmental monitoring built into every tag to meet DNV & joint commission standards

Staff duress

Allow staff to trigger alarms if they are caught in an unsafe situation (workplace violence)

Dashboards

Temperature Monitoring

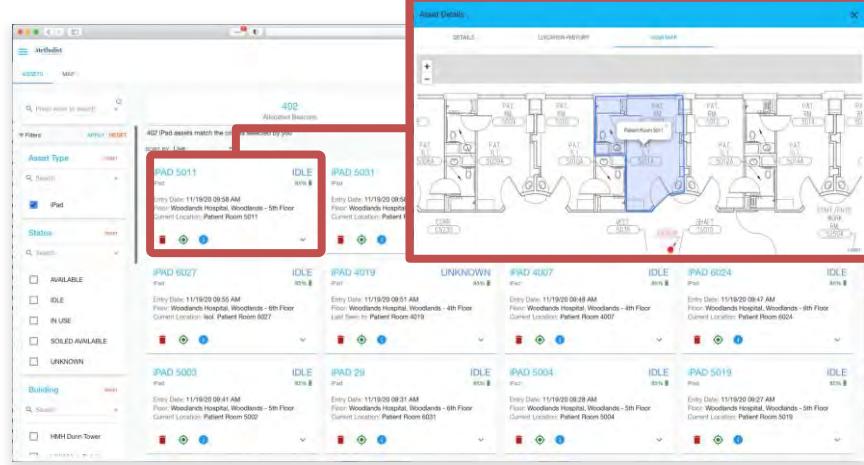


The dashboard displays environmental monitoring data for assets. Key information includes:

- Allocated Beacons:** 55
- Free Beacons:** 2
- 27 assets match the criteria selected by you:**
- Yi Refrigerator (Med Fridge):** ACTIVE, -50.0°C MIN, 15.5°C MAX, -15.0°C MAX. Located in HMH Smith Tower, 8th Floor.
- Yi-4C SM8-09 (Med Fridge):** ACTIVE, -20.0°C MIN, 3.6°C MAX, 0.0°C MAX. Located in HMH Smith Tower, 8th Floor.
- Yi-20C SM (Med Freezer):** ACTIVE, -35.0°C MIN, -28.1°C MAX, -15.0°C MAX. Located in HMH Smith Tower, 8th Floor.
- Yi-20C SM (Med Freezer):** ACTIVE, -35.0°C MIN, -19.4°C MAX, -15.0°C MAX. Located in HMH Dunn Tower.
- Yang -150C (Deep Freezer):** ACTIVE, -170.0°C MIN, -151.3°C MAX, -100.0°C MAX.
- Yi -80C SM (Deep Freezer):** ACTIVE, -90.0°C MIN, -84°C MAX, -60.0°C MAX.



Asset Tracking



The dashboard displays asset tracking data for assets. Key information includes:

- Allocated Beacons:** 400
- 402 iPad assets match the criteria selected by you:**
- Pad 5011 (iPad):** IDLE, Entry Date: 11/19/20 09:58 AM, Floor: Woodlands Hospital, Woodslands - 5th Floor, Current Location: Patient Room 5011.
- Pad 5031 (iPad):** IDLE, Entry Date: 11/19/20 09:58 AM, Floor: Woodlands Hospital, Woodslands - 5th Floor, Current Location: Patient Room 5031.
- Pad 6027 (Pad):** IDLE, Entry Date: 11/19/20 09:55 AM, Floor: Woodlands Hospital, Woodslands - 5th Floor, Current Location: 6027, Patient Room 6027.
- Pad 4019 (Pad):** IDLE, Entry Date: 11/19/20 09:51 AM, Floor: Woodlands Hospital, Woodslands - 4th Floor, Current Location: 4019, Patient Room 4019.
- UNKNOWN (Pad):** UNKNOWN, Entry Date: 11/19/20 09:51 AM, Floor: Woodlands Hospital, Woodslands - 4th Floor, Current Location: 6027, Patient Room 6027.
- Pad 4007 (Pad):** IDLE, Entry Date: 11/19/20 09:48 AM, Floor: Woodlands Hospital, Woodslands - 4th Floor, Current Location: 4007, Patient Room 4007.
- Pad 6024 (Pad):** IDLE, Entry Date: 11/19/20 09:47 AM, Floor: Woodlands Hospital, Woodslands - 5th Floor, Current Location: 6024, Patient Room 6024.
- Pad 5019 (Pad):** IDLE, Entry Date: 11/19/20 09:27 AM, Floor: Woodlands Hospital, Woodslands - 5th Floor, Current Location: 5019, Patient Room 5019.

Map View: A floor plan of the hospital showing the locations of the tracked assets (iPads) across different floors and buildings.



Leveraging Technology to Improve Experience



Enhanced call center platform to help manage call volume (over 6 million in 2023)



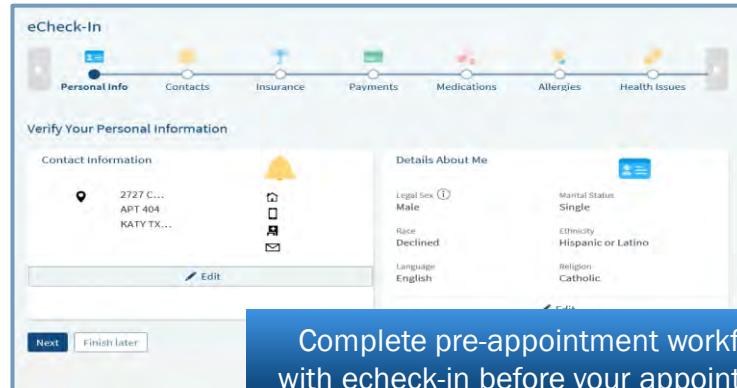
New appointment offer for Office Visit
This offer expires today at 12:59 PM.

New Time
Jul 16 Fri 1:15 PM CDT
Epic Medical Center
456 Bloom Drive
Fitchburg WI 53593
With Nina Dias, MD

Existing Time
Jul 21 Wed 9:30 AM CDT
East Family Medicine
123 Anywhere Street
Verona WI 53593
With Eliza Morgan, NP

Accept new time Keep existing time

Fast Pass is a wait list feature that automatically sends patients text or email messages to notify them of a wait list appointment offering.
18K Appointments filled in 2023



eCheck-In

Personal Info Contacts Insurance Payments Medications Allergies Health Issues

Verify Your Personal Information

Contact Information

2727 C...
APT 404
KATY TX...

Details About Me

Legal Sex: Male
Race: Declined
Language: English
Marital Status: Single
Ethnicity: Hispanic or Latino
Religion: Catholic

Next Finish later

Complete pre-appointment workflows with echeck-in before your appointment.
5,500 completed each day



2:34 AM

Dr. Smith

Text Message Today 2:35 PM

Hello Your appt is confirmed for Tue May 8 at 10:00am. Please remember to bring a list of medications when you come in. Have questions? Text us back! - Dr Smith's Office

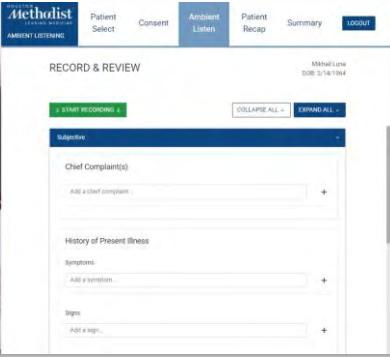
Thank you. I have a meeting that day at 11am. Will that be a problem?

Totally understand. You are the 1st appt. You'll be on your way in time. To make things even faster, you can fill out these forms ahead of time my.chart/47Qz9. Let me know if you have any questions!

Engage with our patients with bi-directional texting for appointment reminders and referrals

Voice Over Text

Ambient Listening



Ambient Listening uses Natural Language Processing to document patient interactions and reduce clicks.

Using Voice in Patient Rooms



Each room is equipped with a smart speaker.



Clinicians carry mobile devices for documentation in the room.



Removed computers from patient rooms.

Outcomes Across Specialties

OPERATIONAL EFFICIENCIES

71%

saw decrease in time in notes per scheduled day

100%

Saw decrease in time notes per appointment

64%

saw decrease in time on unscheduled days

63%

PCG utilization rate through month 2 of pilot

17.6 MINUTES

average time savings in notes per day

PATIENT SATISFACTION

85%

of MDs feel like this allows them to focus more on their patient

71%

of MDs feel like this has improved the quality of the patient experience



ROI

estimated # of incremental visits per week per MD

3 to 5

82%

Saw an increase in **Est Level 4 encounters**

93%

of physicians agree this technology...

saves them time in charting

71%

improved the quality of clinical documentation and their work-life balance

86%

agree this has improved their work-life balance

93%

would recommend this to their colleagues

PHYSICIAN SATISFACTION

Mashgin Self Checkout

Self-Checkout System Advantages

- 24/7 coverage – ideal for weekends and after hours
- Integrates with payroll and credit card machines seamlessly
- Little to no oversight is needed
- One self-checkout register could cover two FTEs (*considering two shifts, including weekends*)

Two-year lookback

- HMH started the pilot with 3 devices:
 - 2 at Marketplace
 - 1 at Texas Sky Café
- System is expanding
 - HMH total of six stations
 - HMTW has one self-checkout system



Annual Direct Cost Savings: \$500K

Artificial Intelligence Applications in Healthcare

Diagnostics
Medical Imaging & Pathology

Predictive Analytics

Personalized Medicine

Virtual Health Assistants

Natural Language Processing (NLP)

Robotic Surgery

Remote Monitoring & Telehealth

Drug Discovery & Development

Clinical Trials

Fraud Detection

Population Health Management

Purpose-Driven AI

- Deployment of AI technology must be purposeful.
- To be adopted with ROI in mind, not for its own sake.
- Must be:
 - Based on solid business cases
 - Guided by internal governance structures



Governance & Ownership

- Deployment requires strong governance and clear ownership.
- Involves strategic approach to:
 - Analyzing alternatives
 - Selecting the right partners
 - Implementing use cases with precision



Insights into Action

- While AI is instrumental in generating insights, its true value is realized only when:
 - Coupled with meaningful process changes
 - Inform and drive transformation for improved outcomes

