Boston Children's Hospital | Innovation & Digital Health Accelerator

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# AI-Driven Transformation and the Future of Pediatric Care

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SVP, Chief Innovation Officer
Boston Children's Hospital

Robert and Dana Smith Family Professor
Harvard Medical School

# Innovation & Digital Health Accelerator (IDHA) Functions & Portfolios

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## INNOVATION

Emerging tech enablement and development of **products** & **partnerships**

## DIGITAL HEALTH

Leading **digital system strategy** & **transformation**

## RESEARCH

**Assessment and validation** of novel tech

### Accelerator Program

(Co)building digital health solutions for impact & sustainability

### AI & Intelligent Automation

Enabling AI to drive efficiencies and improve care

### Connected Care

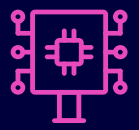
Driving patient & provider growth and enhancing experience

### Research

Validation of emerging technologies

# A team with diverse expertise to drive innovation & transformation

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**Software Engineers**



**Data Scientists**



**UI/UX Designers**



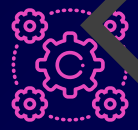
**Scientific & Clinical Advisors**



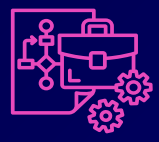
**Strategy Consultants**



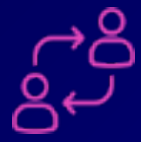
**AI SMEs**



**API/Interoperability Experts**



**Product & Project Managers**



**Change Managers**



**Business Analysts**

# AI Technology Advancements and Projections

## CURRENT

Artificial **Narrow** Intelligence

*Trained to **perform a single or narrow task***

- Digital tools / point innovations (e.g.,: Radiology scans, ICU vital signs)
- Existing manual tasks performed at high levels of accuracy

**Where we are today**

## FUTURE

Artificial **General** Intelligence

*Learning capabilities to **perform any intellectual task a human can***

- Precision medicine adaptations
- Iterative learning and improvement of healthcare systems driven by AI

## THEORETICAL

Artificial **Super** Intelligence

*Cognitive intelligence and **abilities better than those of human beings***

- Healthcare ecosystem and paradigm shift moving from reactive to anticipatory
- AI-driven design of therapies, health interventions, etc.

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# Objectives of AI Deployment at Boston Children's Hospital



Generate **financial ROI** for the institution



Responsible **stewardship** of AI



Demonstrate impact on **quality of care**



Improve **experience** for patients & providers



Lead in AI **innovation**

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# AI Application Domains

### Administrative Operations

- Reduction in administrative burden
- Time spent on more impactful activities
- E.g., Revenue cycle

### Strategy & Intelligence

- AI-powered analytics and operational insights
- Helps leadership identify opportunities, model scenarios, and more efficiently drive towards strategic goals.

### Research

- Accelerating discovery
- Enabling new research workflows
- Powering precision approaches to diagnosis and treatment

### Clinical Care

- Personalized medicine
- Improved diagnostic accuracy for rare & complex disease
- Returned clinical time and attention to the patient encounter

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*The following slides highlight select AI efforts across these domains at Boston Children's Hospital.*

# A Decade of Innovation in AI at BCH




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## Predictive Algorithms & Machine Learning

Build on BCH expertise and data to model and predict health outcomes/diagnoses, hospital bed capacity, and public health events.

Google Health Studies

ChRIS

## Natural Language Processing (NLP)

Pilot and scale voice and natural language processing technology to reduce administrative burden and enable practice at top of license.

abridge

alexa

## Intelligent Automation

Pilot and scale solutions that unlock employee and clinician time by using RPA to automate repetitive tasks.

Power Automate

AUTOMATION ANYWHERE
Go be great.

## Generative AI

**Embed generative AI across clinical and operational workflows to reduce burden, surface insights, and deliver more personalized, efficient care at scale.**

OpenAI

Google Research
co-scientist

Boston Children's Hospital
InternalGPT

# AI's Value Proposition and Operating Pillars at Boston Children's

## Why

Reduce provider burden & enable practice at top of license

**Focus to date**

Drive cost savings & operational efficiencies

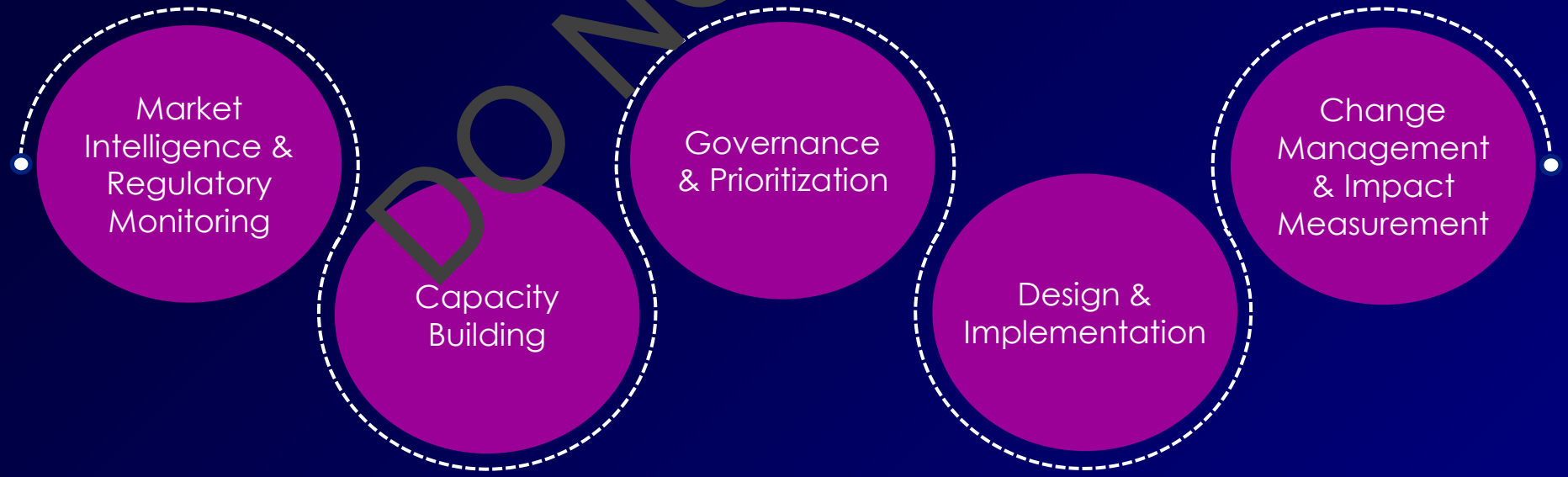
Improve & streamline patient experience

**Increasing Focus**

Improve diagnostic accuracy & personalize care

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## How



# AI Governance Overview

## Objectives

1. To ensure responsible, safe, secure, and scalable use of AI across the hospital
2. To coordinate AI efforts and break down siloes, improving efficiency/speed in operations, reducing duplicative work, and enabling effective resourcing
3. To enable the adoption of AI and intelligent automation tools to drive impact for employees at the individual level and in support of enterprise strategic priorities

## Working Groups



**BCH AI Policies & Procedures**

*AI governance will guide the definition and promotion of internal AI policies & procedures*



**Monitoring & Evaluation Standards**

*AI governance will establish and support clear guardrails / standards around performance & reporting*



**Education, Engagement, & Adoption**

*AI governance will help develop and coordinate AI adoption, engagement, and education efforts across the enterprise*

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# Governance & Responsible AI

### STRATEGIC PRIORITIZATION

**Prioritization efforts aligned to OKRs and strategic initiatives**

AI investments prioritized against BCH's strategic objectives and annual OKRs moving forward for increased alignment.

### RISK MITIGATION

**Processes and systems to manage against risk**

Policies, guardrails, and monitoring & evaluation practices to manage safety & compliance of AI deployments across BCH.

### ADOPTION & RETURN

**Best practices for adoption & deployment**

Investing in education, engagement and training to support adoption and ultimately drive returns / impacts.

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**To Date:** Submission to the AI inventory and adherence to any associated governance is required for all AI tools deployed with BCH staff and patients. The governance process includes risk categorization and submission / review of a monitoring & evaluation form with regular cadence for report-out of performance / outcomes

**Upcoming:** Enterprise policies / guidelines focused on risk reduction in applications of AI*

*See priority policies list for specifics

# Two primary categories of AI efforts at BCH:
## *balancing agility with scalability*

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### ENTERPRISE AI

**Goal:** ensure responsible, scalable, and sustainable adoption of AI at Boston Children's Hospital, and integrate it seamlessly into hospital operations

**Example Efforts**



InternalGPT



Ambient Documentation



Prior Authorization

### SMALL-SCALE INNOVATION & DEVELOPMENT

**Goal:** explore and validate high-impact, novel AI use cases, engaging our workforce in the application of emerging tech and generating key learnings quickly & early

**Example Efforts**



Medical Education



Patient Search



Clinical Document Assistant

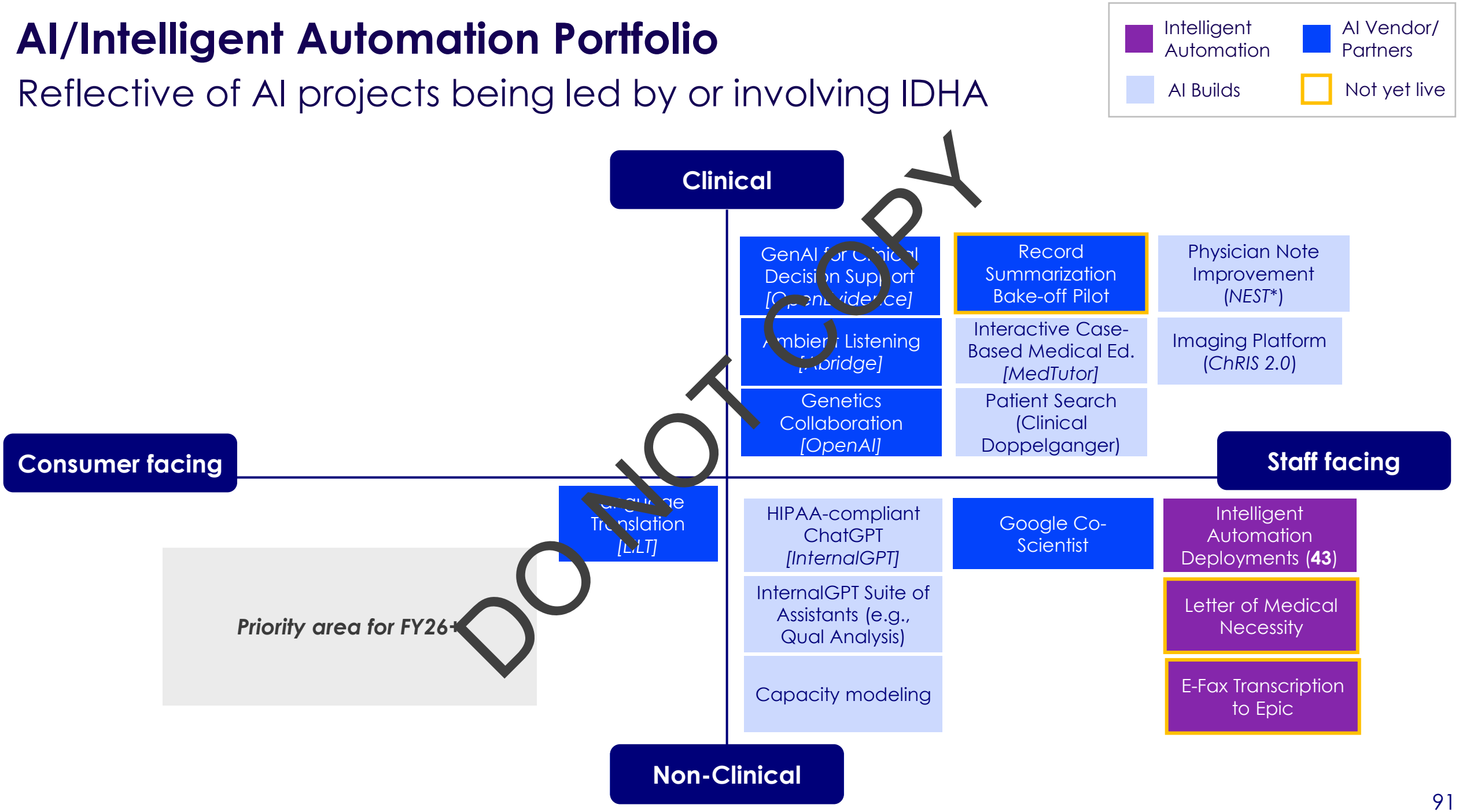
# Market maturity and risk inform prioritization and long-term strategy




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# AI/Intelligent Automation Portfolio

Reflective of AI projects being led by or involving IDHA



# Democratizing AI Access: InternalGPT

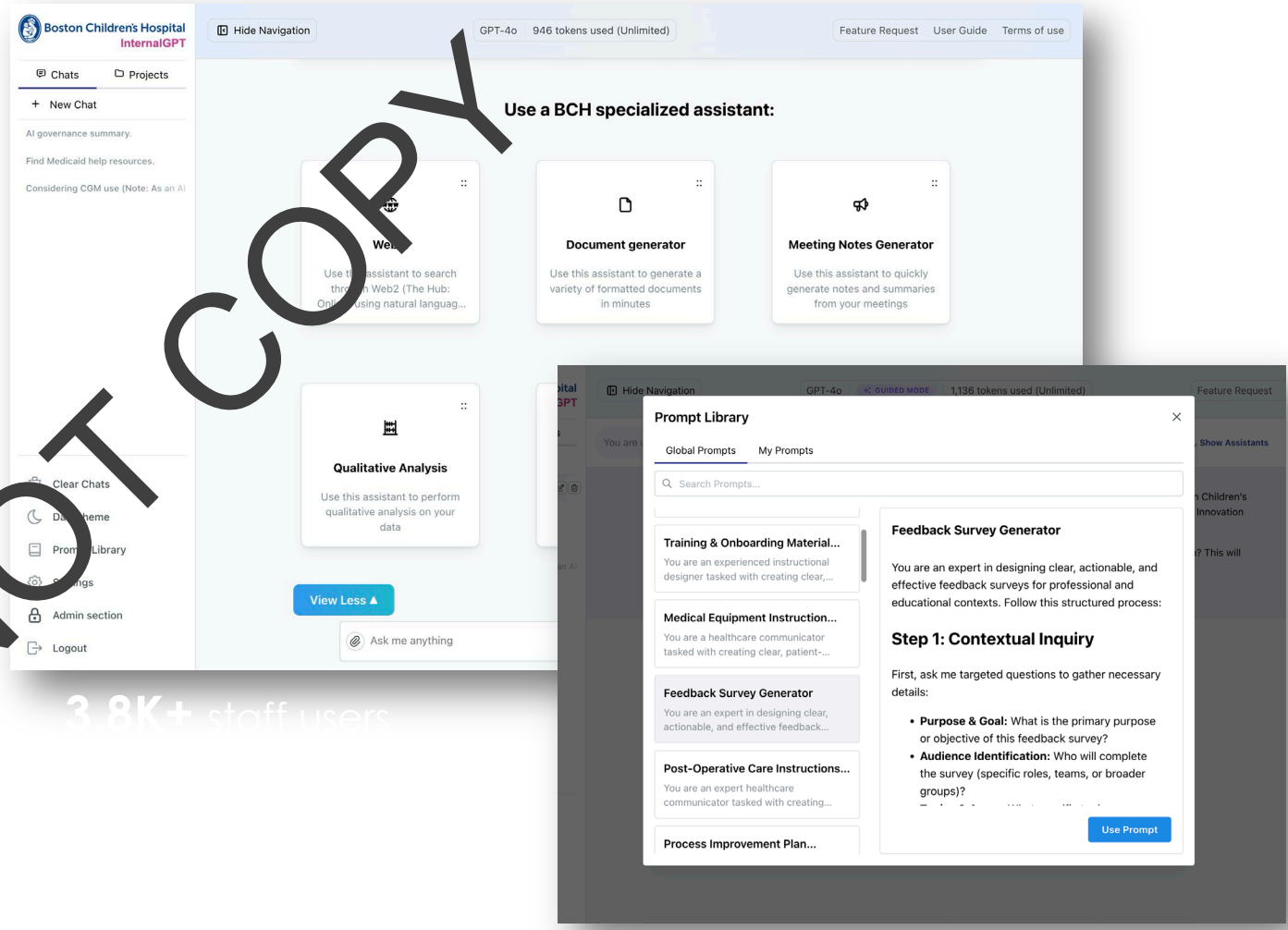
ENTERPRISE AI

## Initial Vision and Purpose:

- Built to unlock enterprise access to LLMs via a secure, cost-effective, HIPAA-compliant platform
- Architecture preserves optionality / portability

## Sustaining Value:

- Built assistant suite and prompt library
- Multi-model access (currently all OpenAI models, bringing in Anthropic next)
- Connections to data sources internally (e.g., Epic) and externally (e.g., PubMed)




3.8K+ staff users

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**Utilization of a HIPAA-Compliant Large Language Model Chatbot in an Academic Pediatric Medical Center: Case Study**

# Capacity Building & AI Literacy

## TO DATE

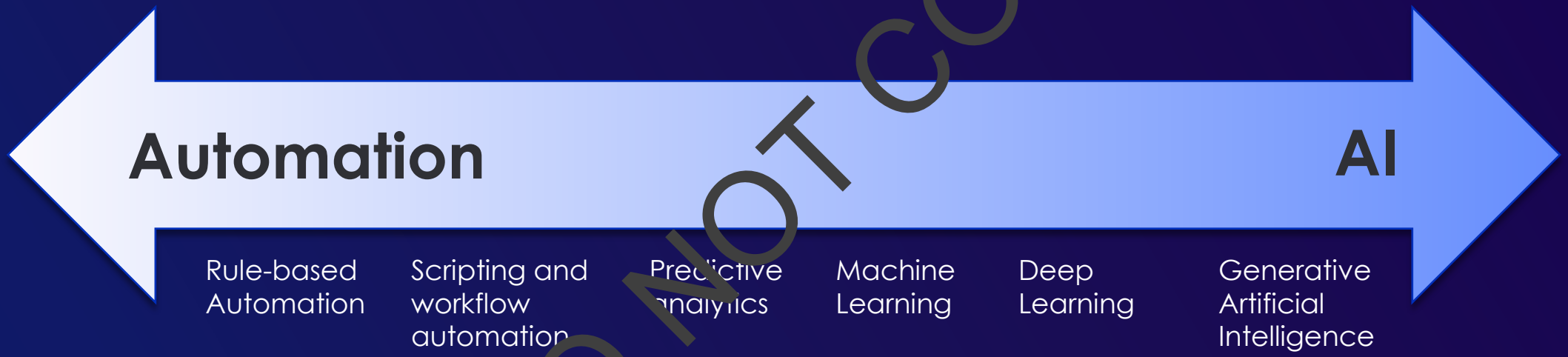
- Webinar Series
- AI Resource Hub
- Guardrails & Policies
- Office Hours for Deployed Tools
- Department Roadshows

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## FY26

- AI Fundamentals Training for All Staff
- AI Leadership Upskilling
- Training & Adoption Best Practices for AI Product Owners
- AI Ambassador Program

# Not all problems require AI solutions




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# AI Partnerships

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# Intelligent Automation

- Launched first automation with Automation Anywhere (platform partner) in FY24 Q1
- Deployments across HR, Finance, Legal, Supply Chain, Patient Safety, and Clinical departments
- Automations have become increasingly intelligent & agentic as the capabilities have advanced, broadening set of applicable use cases

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## Program Accomplishments to Date

**>50** deployed automations

**60K+** hours saved

**$6M+** in cost savings*

**Largely productivity gains*

AUTOMATION ANYWHERE



Reduce time spent on manual & repetitive tasks



Create workforce capacity without the need to back-fill roles



Improve staff productivity, with time spent on higher value activities



Support BCH staff retention / increase job satisfaction



Reduce operational friction and costs by automating high-volume workflows

ABRIDGE

Reduce **administrative burden**

Reduce **time spent documenting** in the EMR

Improve **time to completion** of signed note

Improve **patient care delivery**

# AI-Powered Documentation

- After a bake-off between Nuance DAX Co-pilot and Abridge, Abridge was selected as the enterprise partner
- Broader enterprise roll-out took place in two parts in FYQ1 2026:
  - Ambulatory and ED access on 10/15/25
  - Inpatient access on 11/12/25
- Expansion to nursing (30 bed pilot) next
- Partnership with Digital and IT critical to launch & scaling success

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**1.2K+**
**Active Providers to date**

**94K+**
**Notes Generated in H1 FY2026**

**73%**
**Agree/strongly agree to increased work satisfaction**

# LILT: AI-driven language translation

- First use case = discharge instructions during inpatient stays
- Combines machine learning with professional linguist review for **highly accurate, efficient, and continuously-improving translations**
- Epic integration in progress
- Future use cases = medical records, consents, portal messages

# Early Pilot Results

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## TRANSLATION NEEDS MET

Before*

**8.4%**

of eligble[1] encounters got translations

With LILT

**52.2%**

of eligible[1] encounters got translations

**6.2x**

more encounters with translated discharge instructions

## AVG. TURNAROUND TIME[2]

Before

**8.71**

hours

With LILT

**3.01**

hours

**65%**

faster turnaround for top 3 languages (Spanish, Portuguese, Arabic); N=70

**pre-LILT enterprise baseline*
*1= Patients who have preferred language other than English (Interpreter Needed Flag = Yes or Preferred Language ≠ English)*
*2= in business hours*
*Data above reflects 11/25/25-3/20/2026*

# AI-Powered Clinical Evidence

OpenEvidence®



Improve clinical decision quality with the latest peer-reviewed research



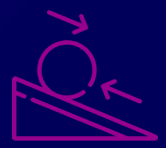
Reduce hours spent searching the medical literature



Provide clinicians with instant evidence-based answers at the point of care



Free for verified clinicians at no enterprise license cost



Strong organic adoption by BCH providers prior to enterprise rollout

- Signed Business Associate Agreement (BAA) enabling secure enterprise use
- Deployed Single Sign-On (SSO) for seamless authentication via BCH credentials
- Epic integration in progress to surface evidence-based answers directly within clinical workflows

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## Current adoption

**2.2K+** active users

**464K+** evidence searches

**52%** user activation rate*

**Of eligible BCH clinicians*

# AI Builds

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IN DEVELOPMENT

# Med Tutor

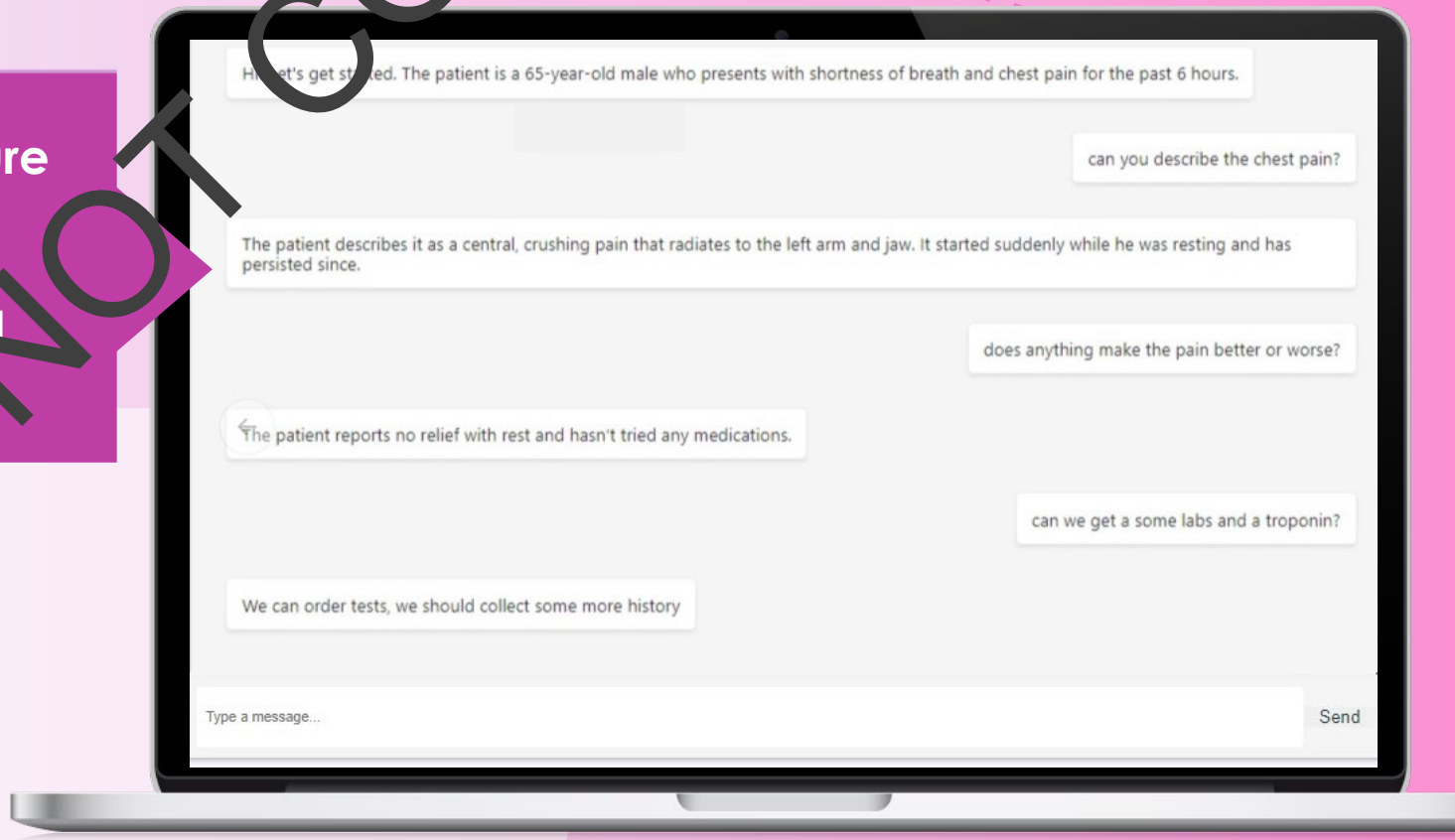
An LLM-powered application that serves as a tutor to guide "healthcare learners" through medical cases to help build their clinical reasoning skills in an interactive way

**Medical cases are:**

- **NOT PERSONALIZED**
- **NOT INTERACTIVE**
- **NOT READILY ACCESSIBLE**

**A "healthcare learner" interface will feature an interactive tutor that can guide med students, residents, and fellows through medical cases, adjusting interactions and prompts based on student responses**

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**ANTICIPATED IMPACT**

- Increased learning opportunities
- Greater volume of cases
- Increased relevance of cases
- Greater transparency / performance feedback
- Improved standardization

IN DEVELOPMENT

# Clinical Doppelganger

AI-powered platform for granular medical record search, enabling healthcare professionals to perform highly detailed queries across structured and unstructured patient data.

*Initial Pilot: CICU Patient Summarization*




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## ANTICIPATED IMPACT

- Reduce time spent searching for similar patients
- Improved intervention outcome predictions
- Potentially enhance research cohort selection

## FUTURE STATE

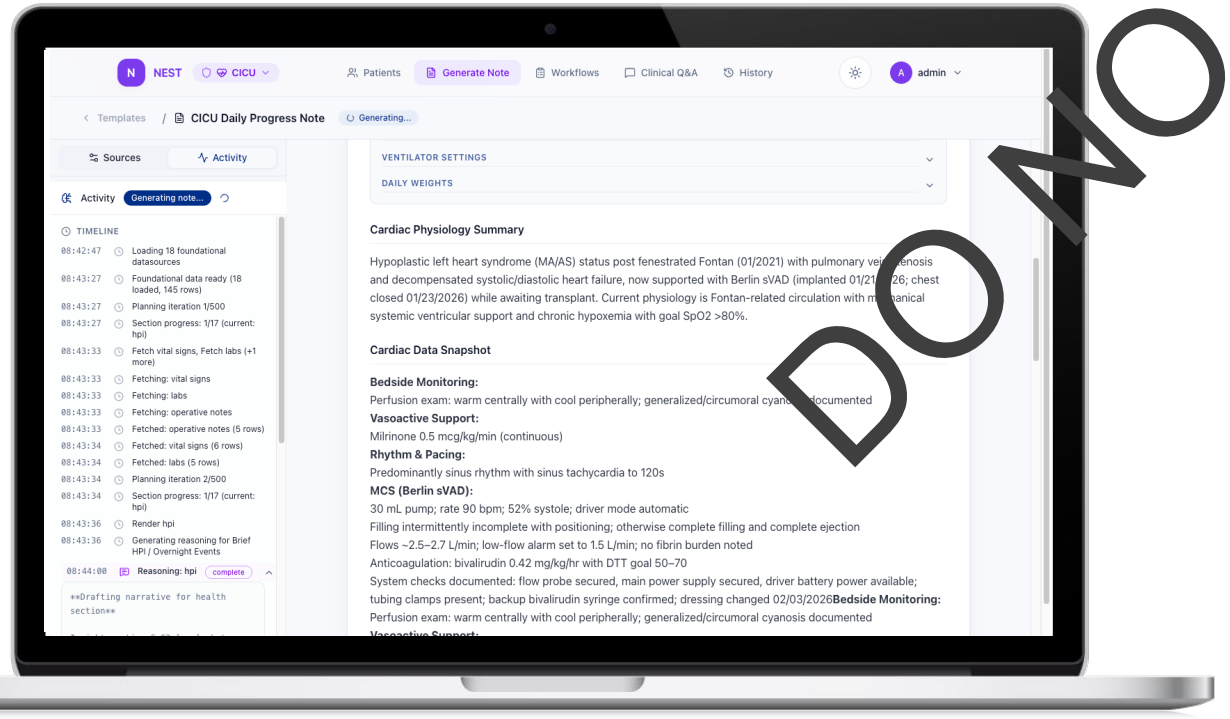
- Expansion to additional specialties and departments
- Additional modalities and real-time patient data

**Received the Amazon Imagine Grant to support project efforts**

# NEST: Note Enhancement Support Tool

IN DEVELOPMENT

Critical patient information is dispersed across many parts of the chart, requiring providers to search through vitals, device data, telemetry, labs, imaging, consults, medications, and overnight events just to understand the patient's current state.
This makes it time-consuming and cognitively taxing to assemble an accurate, up-to-date picture of a critically ill patient.




- LLM-enabled clinical documentation + workflow layer that sits on top of a hospital's EHR/ warehouse data.
- It generates higher-quality clinical notes, powers workflows (e.g., coding, discharge readiness), and Q&A through natural-language interaction with the patient chart.
- NEST is the data layer on which many automations and workflows can be powered

## USE CASES IN DEVELOPMENT

- CICU Progress Note
- Anesthesia Pre-Op Note
- Patient Transition-of-Care Summaries
- Radiology Imaging Report Summarization
- ICD-10 Coding

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# Overview: Rethinking Genetics with AI

Boston Children's Hospital **Manton Center for Orphan Disease Research**

+

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+

OpenAI

Leverage inputs of patient genomic and phenotypic data to test AI as a "co-pilot" for the diagnostic odyssey

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Boston Children's Hospital adopts new ChatGPT platform

BECKER'S HEALTH IT

AI

Everything announced at OpenAI's first developer event

TechCrunch

11-08-23 | AI DECODED

OpenAI's Dev Day: Is the bot revolution finally coming?

FAST COMPANY

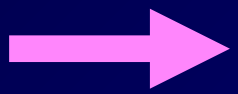
# How it Works

Human Phenotype Ontology (HPO) codes

Genetic Input Criteria (CADD score & variant criteria)

Literature Search

AI "Logic and Reasoning"

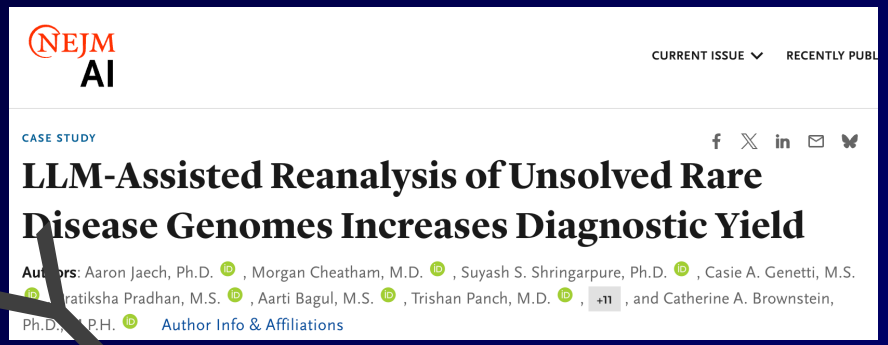


AI Recommendation

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BCH Genetics <> Open AI Collaboration

# Outcomes



NEJM AI

CURRENT ISSUE RECENTLY PUBL

CASE STUDY

**LLM-Assisted Reanalysis of Unsolved Rare Disease Genomes Increases Diagnostic Yield**

Authors: Aaron Jaech, Ph.D., Morgan Cheatham, M.D., Suyash S. Shringarpure, Ph.D., Casie A. Genetti, M.S., Pratiksha Pradhan, M.S., Aarti Bagul, M.S., Trishan Panch, M.D., +11, and Catherine A. Brownstein, Ph.D., M.P.H. Author Info & Affiliations

>1,000 runs so far → Ability to reanalyze at scale

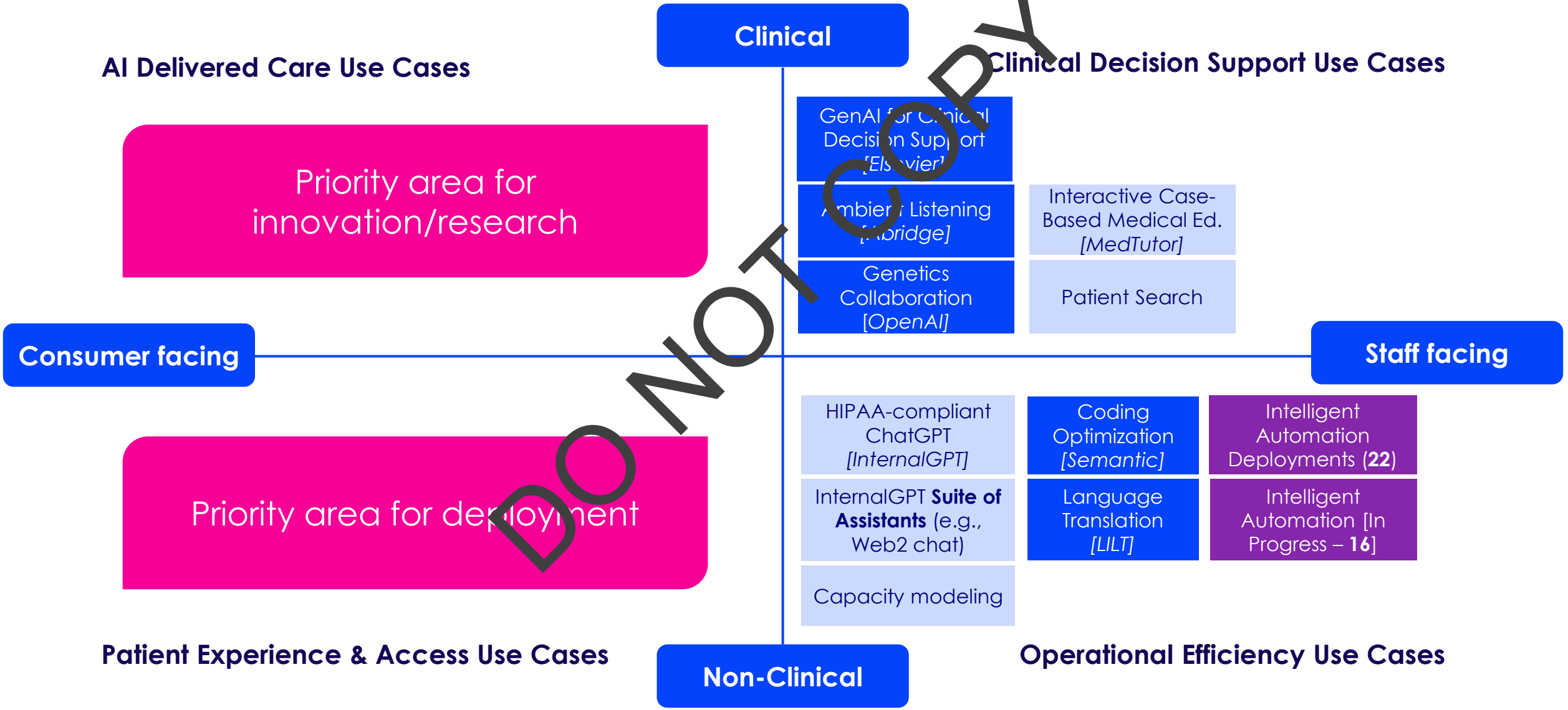
>40 families impacted → Results returned ended their diagnostic odysseys. (4.5% improvement in results return)

Several strong leads under active validation → Demonstrated accuracy, reproducibility, and potential for novel gene discovery

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# AI/Intelligent Automation Portfolio

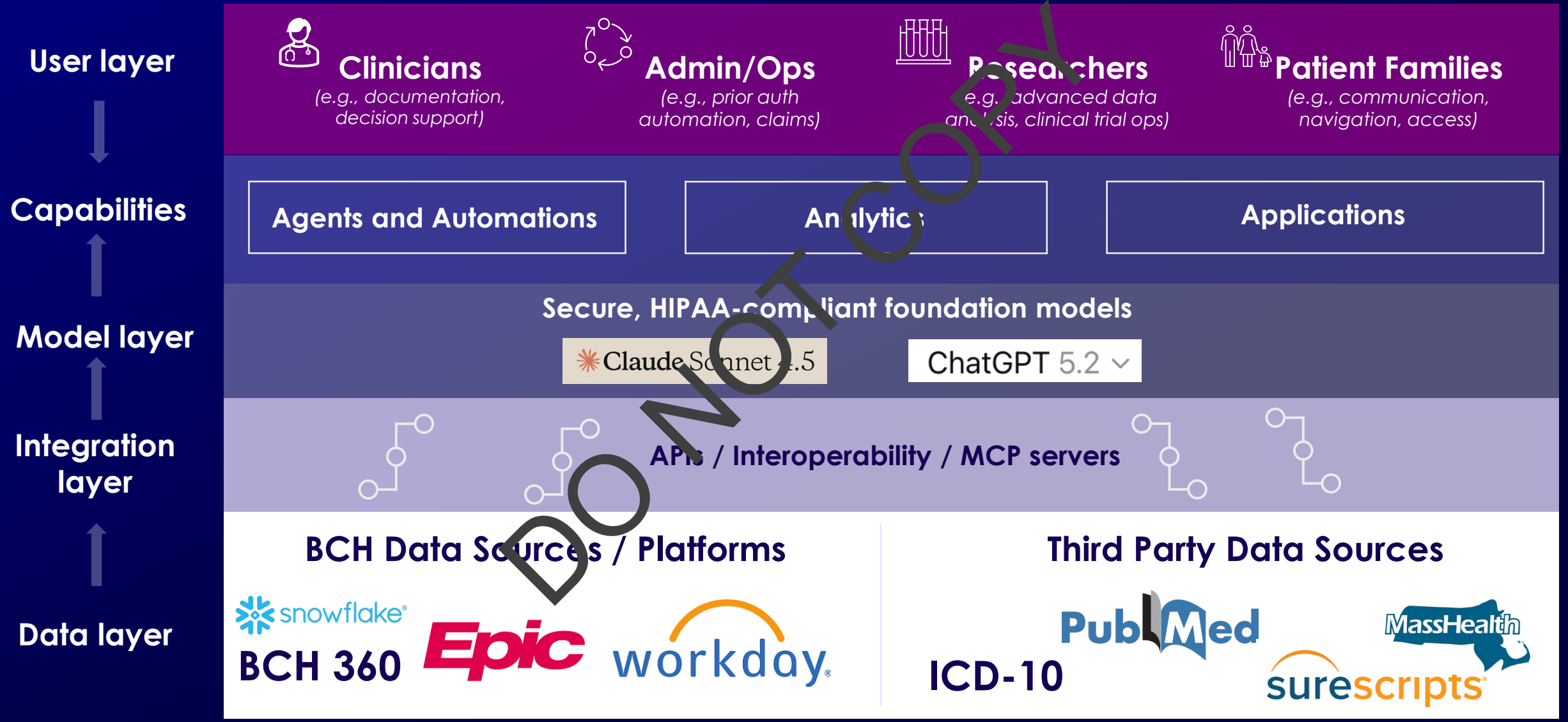
Reflective of AI/IA projects being led by or involving IDHA




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# Looking ahead: BCH system of intelligence

*Unified platform accelerating AI deployment and enabling scale*




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**data sources are illustrative, not exhaustive*

# Thank You

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