Harnessing the Power of AI: Revolutionizing HEOR and Market Access

ISPOR Annual 2024

TRINITY

Introducing Trinity Life Science's ISPOR 2024 Symposia...

Hosted By...

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Head of Generative AI COE

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**Featuring...*

James Creeden, MD PhD
Medical Affairs Expert

CGC Genomics

Francesco De Solda, PharmD, MBA
Value and Access Expert

Johnson&Johnson Innovative Medicine

Adrienne Lovink
RWE Expert

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Today's Panel Topic...

HARNESSING THE POWER OF AI: REVOLUTIONIZING HEOR AND MARKET ACCESS

ISPOR 2024 THEME

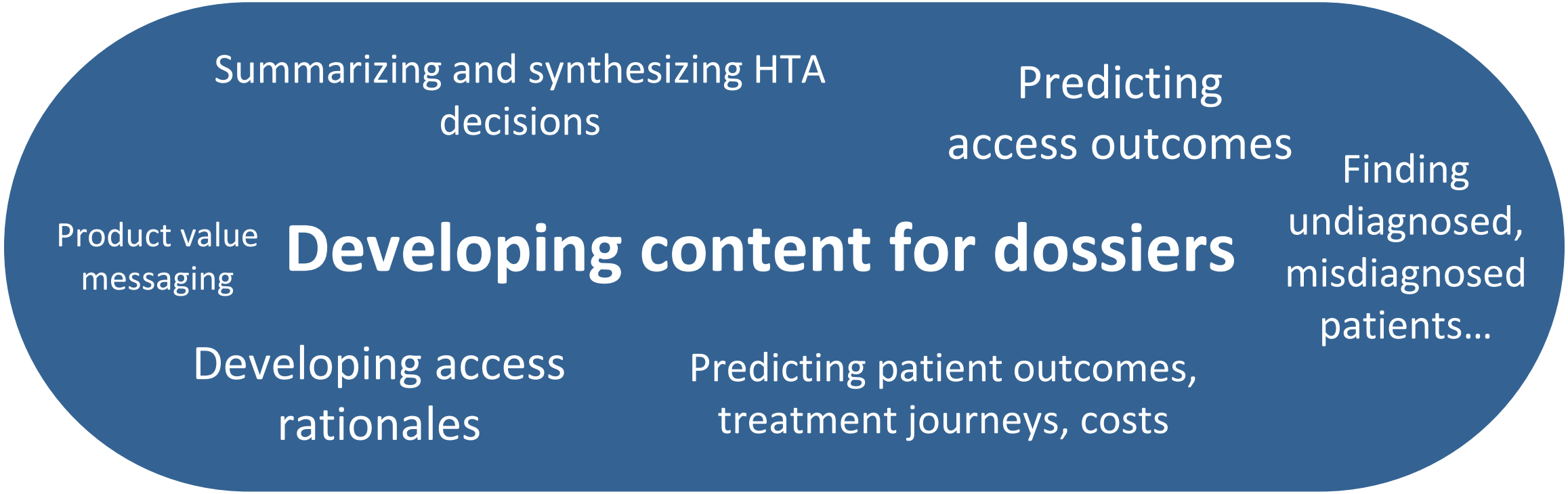
"THE TRANSFORMATIVE IMPACT OF AI IN HEOR AND MARKET ACCESS"

Note: *The views and opinions shared by the guests featured on this panel are solely their own and do not reflect those of their current employers

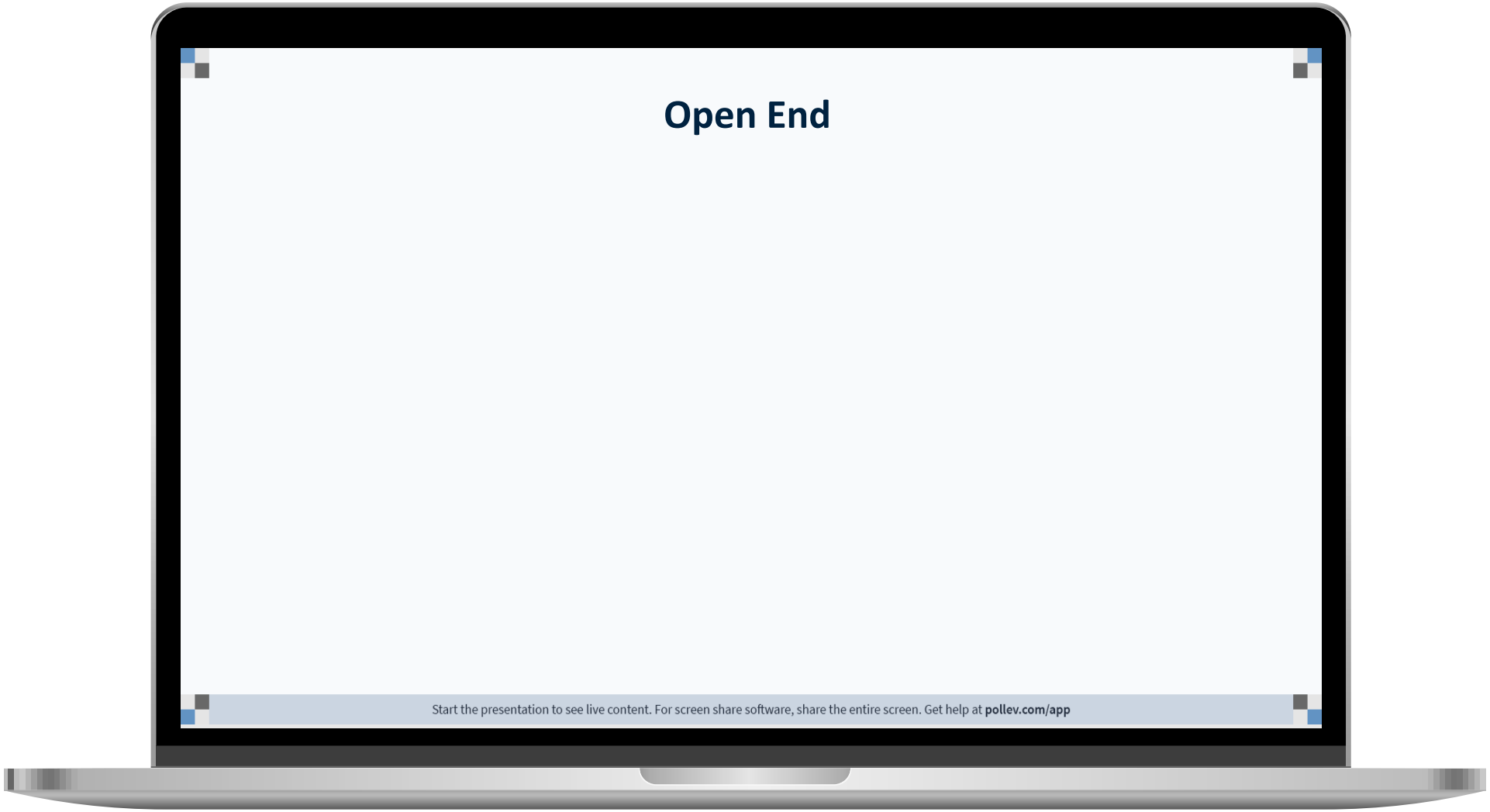
Today's goal: "Making AI Real" in HEOR and Market Access

- 600 publications on the application of AI in HEOR methods over the last five years
- 200+ poster/panel presentations at ISPOR on the topic of AI in 2023 alone
- and yet…questions remain on how and where to best apply and drive adoption of HEOR and Market Access AI initiatives

Common themes in publications and posters…



What is or should be a priority AI application for HEOR and market access at your organization over the next 12 months?



AI should really be considered “Augmented Intelligence”…

What AI Is Good At

- ✓ Summarizing Documents
- ✓ Extracting Facts and Insights
- ✓ First Draft Content Generation
- ✓ Idea Generator, Thought Partner
- ✓ Research Tool to Answer Questions
- ✓ Finding Patterns in Historical Information

Areas Where Human Domain Experts Excel

- ❑ Making Judgments, Decisions, Recommendations

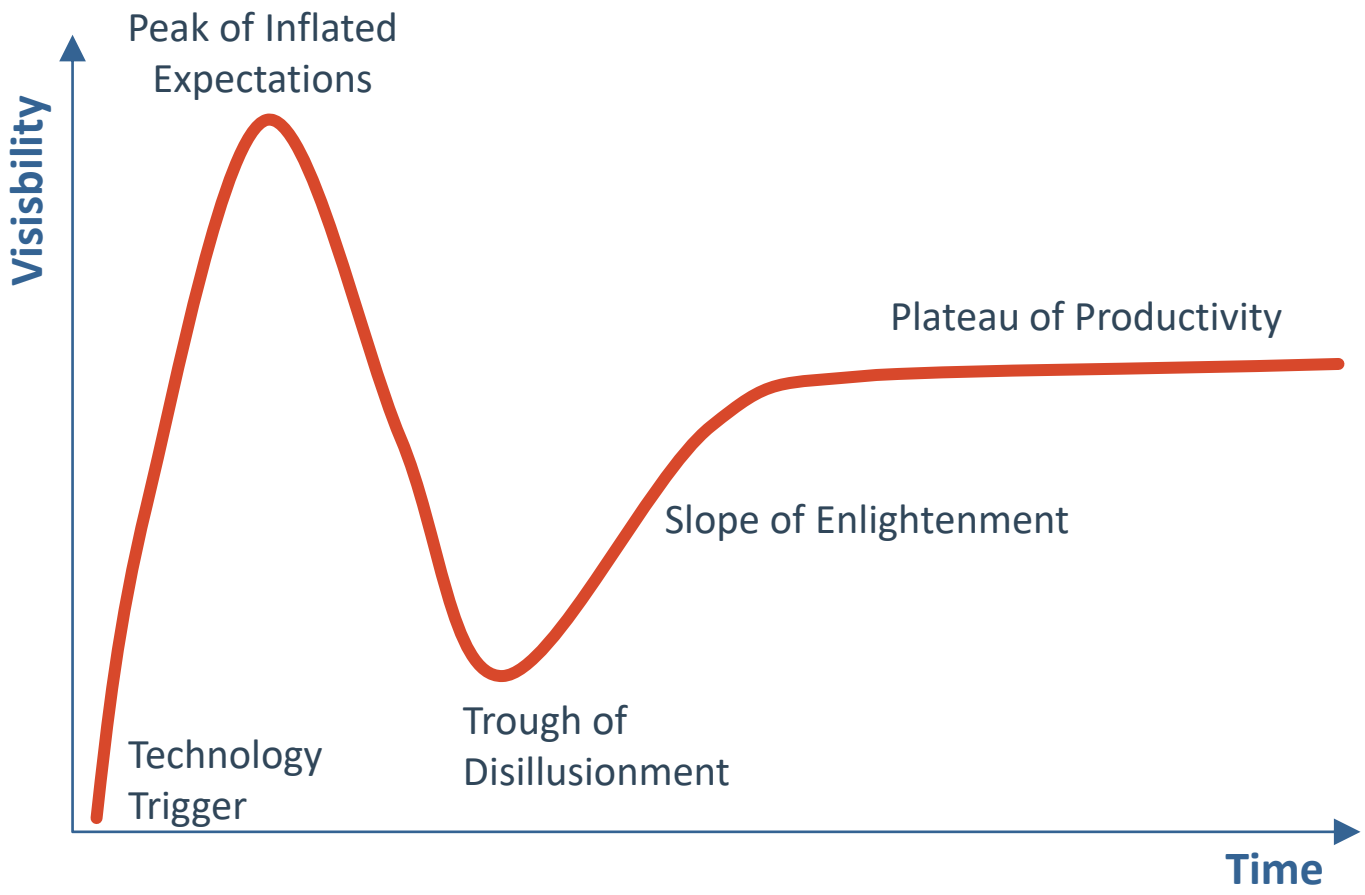
- ❑ Understanding Nuance and Context
- ❑ Ethical Considerations

- ❑ Creative Innovation
- ❑ Emotional Intelligence

- ❑ Adapting to Unpredictable Changes

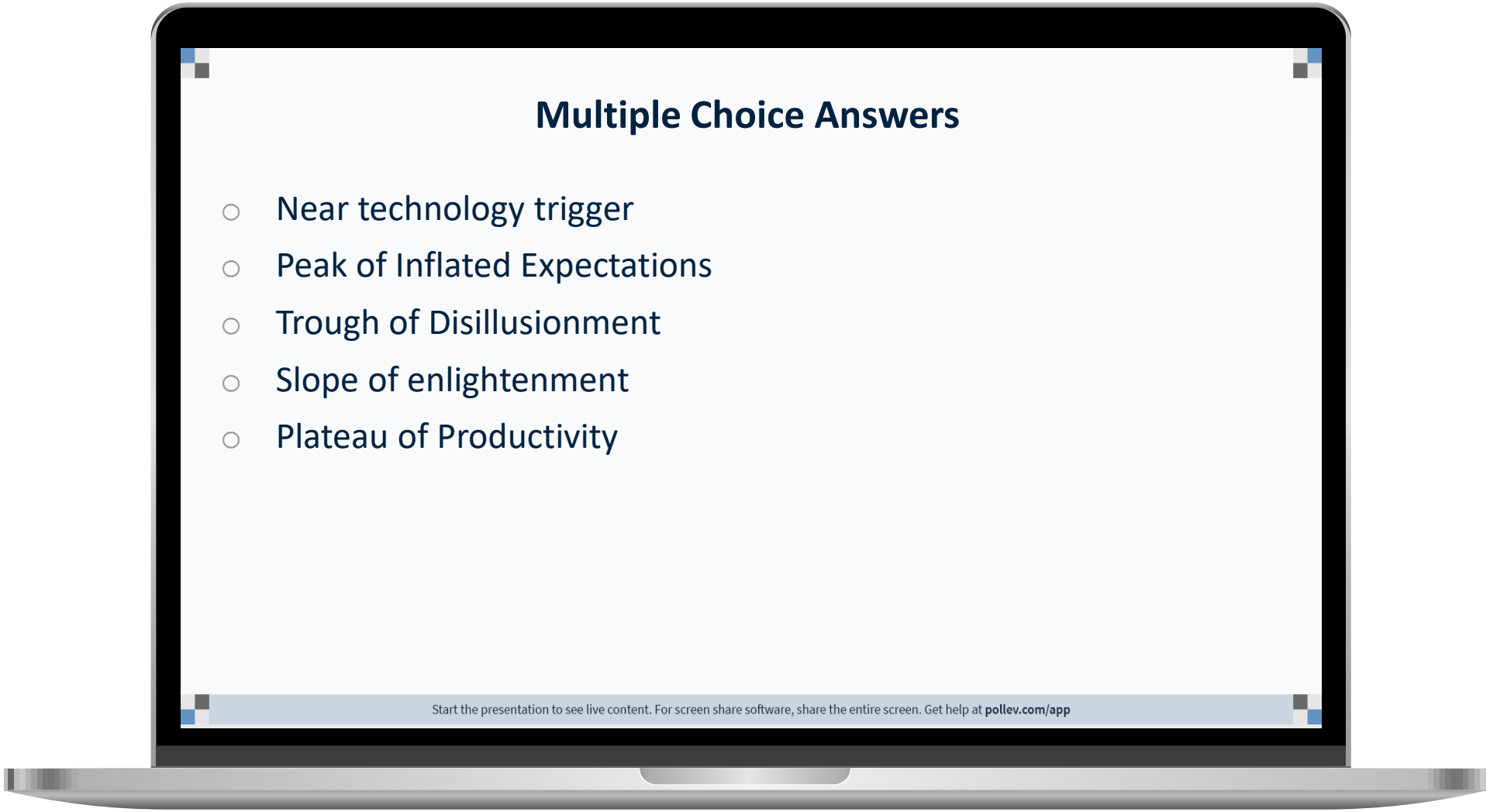
Where are we with AI in HEOR and Market Access?

Adoption of new technology typically takes this "hype cycle"



Source: Gartner Hype Cycle

Where are we with AI in HEOR and Market Access?



Today's discussion will focus on the following three real-world case studies on the use of AI in HEOR

James Creeden

The Role of AI in the interpretation of genomic testing reports

- LLMs can learn very fast - this process will only get faster
- Human expertise still needed for validation and trust
- This validated use case confirms the broader applicability of AI in HEOR work (SLRs, TLRs, etc.)

Francesco De Solda

Utilizing AI-powered tools and subject-matter experts (SMEs) to understand customer expectations for an oncology therapy

- Using AI to efficiently conduct landscape review and linguistic analysis concept of "cure" in Prostrate Cancer
- AI enabled a broad look at definition of cure, preferred terminology to describe cure and related terms

Adrienne Lovink

Current and emerging applications for AIML specific to HEOR applications

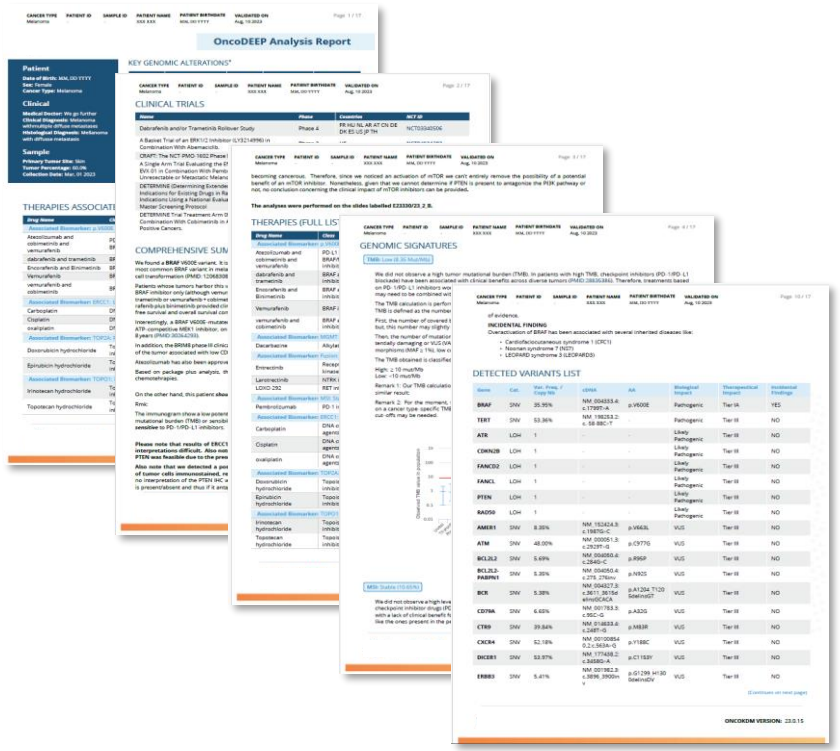
- Real-world examples of problems to solve and the key benefits of an AIML enabled approach
- Deploying AI to augment Clinical Trial Site Selection and Prioritization

The goal of these case studies is to elucidate real-world and practical applications of AI from actual users in the field today

Case Study

The Role of AI in the interpretation of genomic testing reports

In precision oncology, genomic profiling generates extensive laboratory reports…



The results are outlined in **extensive (20-50 pages) laboratory reports** which are **challenging** to be **interpreted** by physicians promptly and efficiently

Report data is **comprehensive yet extremely dense** as it is comprised of text, tables, figures and graphs that **require time** and sometimes different **specialized knowledge** for analysis

~80% of oncologists struggle to decipher the **reports** and **~50% of oncologists** have **difficulty** in **understanding the complex genomic data;** this results in an **underutilization** of validated data and **failure** to leverage a **great opportunity** for **individualized treatment decisions**

Therefore, the full value of these reports **is often not realized** as community oncologists often **practice using guidelines** and may not make use of genomic profiling, limiting access to precision oncology approaches

By making this additional dimension of clinically valid information more widely available and digestible, **we can expand the analysis and prediction aspects while still leaving the clinical judgments and decisions to clinicians**

There is a need to make genomic profiling reports more interpretable and accessible to physicians surmounting the bottleneck of human and time-consuming interpretation

Case Study

The Role of AI in the interpretation of genomic testing reports

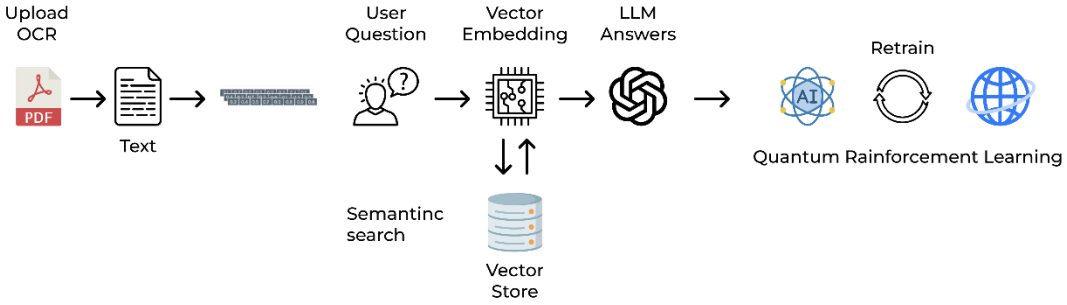
WHY AI?

Oncologists need a **practical and validated method** to integrate the **granular data** included in genomic profiling reports to their decision-making, bypassing the **time-consuming task of interpretation** by analysts

An AI workflow was developed to streamline genomic profile interpretation

- The AI tool developed can **search relevant** information for inputted query and **generate text** in response to the request
- The outcome of the AI tool is the **production** of **informed** and **accurate** analysis **outputs** that can be **confidently** and **promptly used by physicians**
  - **Human feedback** is central to the **training** process and **improvement** of the AI tool*

Explainable Generative AI-based Cancer Genomics Report Interpretation infused with Quantum Computing
Reduce 90% of text reading and analysis work



Learnings

- **LLMs** (used in AI tools) can be leveraged to **analyze human genomic profiling data promptly**; a process which can be **further improved** with human feedback and become more **efficient, accurate, and faster** over time
- "**Explainable AI**" and "**Human in the loop**" are reasonable expectations for any mission-critical analyses

Future Applications

- Although large corporation are unlikely to use standalone AI in the near future for mission-critical applications, **HEOR** and **market access professionals could benefit from these AI tools**
- For example, HEOR professionals could take advantage of the **implementation of report analysis** which be **conducted locally, internally** and **quickly** with **low risk** and **information protection**

*Reinforcement learning is a type of machine learning in which a computer learns to perform a task through repeated trial-and-error interactions within a dynamic environment. The "loss" of this AI tool, how often its model's predictions are incorrect, have been measured and observed to decrease significantly as training progresses. In research, it was shown that there is a sharp decline in the loss at the beginning of the training process, yet the model quickly grasps the patterns in the data; Abbreviations: AI: Artificial Intelligence; LLM: Large Language Model

Case Study

Using AI to understand stakeholder perceptions of “Cure”

In Prostate Cancer (PC), emerging treatments have increased the possibility of achieving cure…

Absence of curable treatment in PC

Historically, **treatments** in **PC** have revolved around **controlling** disease **progression**

With emerging treatments in early-stage PC, the **possibility of achieving cure across PC stages** has increased sparking conversations of curative treatment in PC

Xtandi (enzalutamide) 40 mg tablets | 80 mg tablets

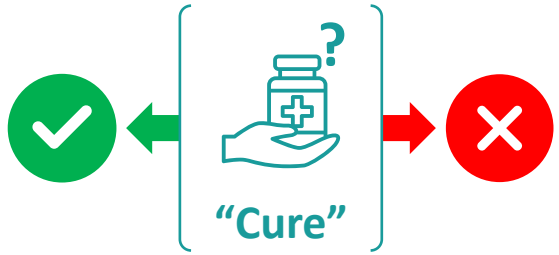
Erleada (apalutamide) 60 mg tablets 240 mg tablet

NUBEQA (darolutamide) 300 mg tablets

?

Uncertainty in perceptions of “cure” in PC

Given the evolving treatment landscape, manufacturers are interested to learn if stakeholders will **define and perceive “cure” differently in PC**



Understanding how the concept of cure is perceived and/or defined is important for **effective communication across stakeholders**, including academic researchers, healthcare professionals (HCPs), policymakers, and most importantly patients

In the absence of AI, hypothesis testing could be inefficient and costly…

- Without **AI**, **hypothesis testing** could translate to **prolonged data collection**, **manual analysis**, and potentially **limited insights** due to **traditional methods' constraints**
- With **traditional research methodology**, manufacturers would rely on **costly**, **time-consuming**, and face **scalability challenging methods** such as **surveys** and **interviews** to understand **stakeholders' views** on **"curative treatment"** in **PC**

Abbreviations: AI: Artificial Intelligence; PC: Prostate Cancer

Case Study

Using AI to understand stakeholder perceptions of “Cure”

WHY AI?

- **AI tools** streamline research by analyzing **large datasets**, gathering stakeholder **input across platforms**, and understanding **diverse perceptions** of concepts like "cure“;
- AI's capacity **improves communication strategies**, especially for complex topics like early-stage prostate cancer "cure" discussions.

AI-Powered Landscape Analysis of Prostate Cancer Cure Concept

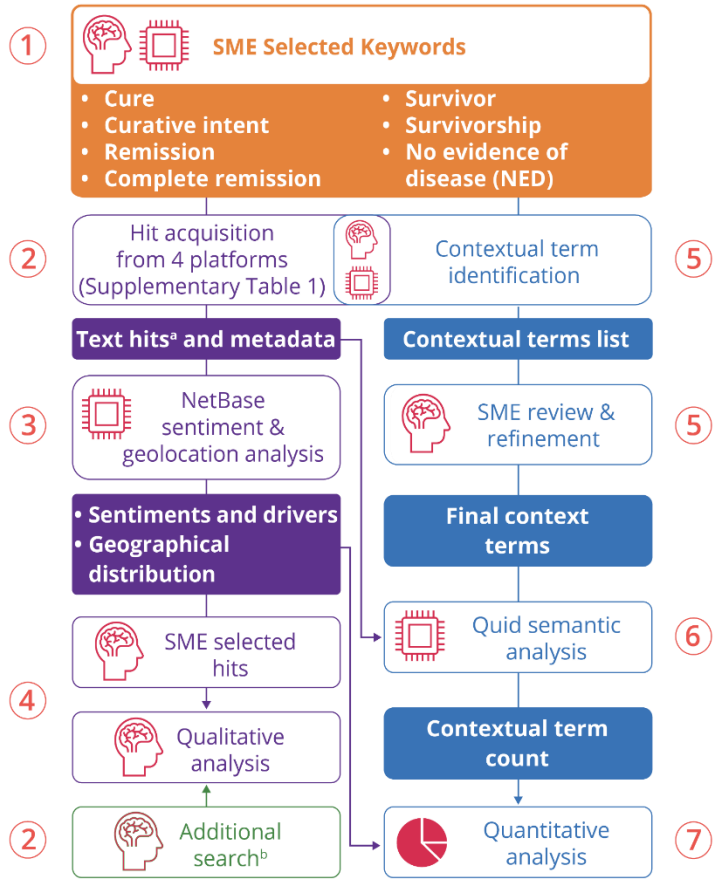
- **AI analyzed 20K+ social media posts** to study public **perceptions and usage of "cure"** for PC;
- **AI enables effortless dataset reevaluation** to capture current perceptions. Keywords like **cure**, survivorship, and survivor reveal **diverse sentiments;**
- **No consistent definition** for **cure** was found with **varied perceptions** across stakeholders types.

Learnings

- The **AI-driven approach** can enhance and potentially outperform **traditional methods** of conducting landscape analysis;
- This research demonstrated how AI can distinguish high-fidelity nuances in language across diverse stakeholder groups.

Future Applications

- In the future, **AI-driven language analysis** could revolutionize **patient-centered care** by uncovering **valuable**, often **overlooked insights** crucial to the **patient experience**, particularly in disease areas like PC.



Abbreviations: AI: Artificial Intelligence; PC: Prostate Cancer

Case Study

Real-world examples of the key benefits with a AIML approach

Approach: Using RWD, past enrollment, and RCT data, leverage AI to predict clinical sites, patient enrollment, drop-out, and endpoint progression.

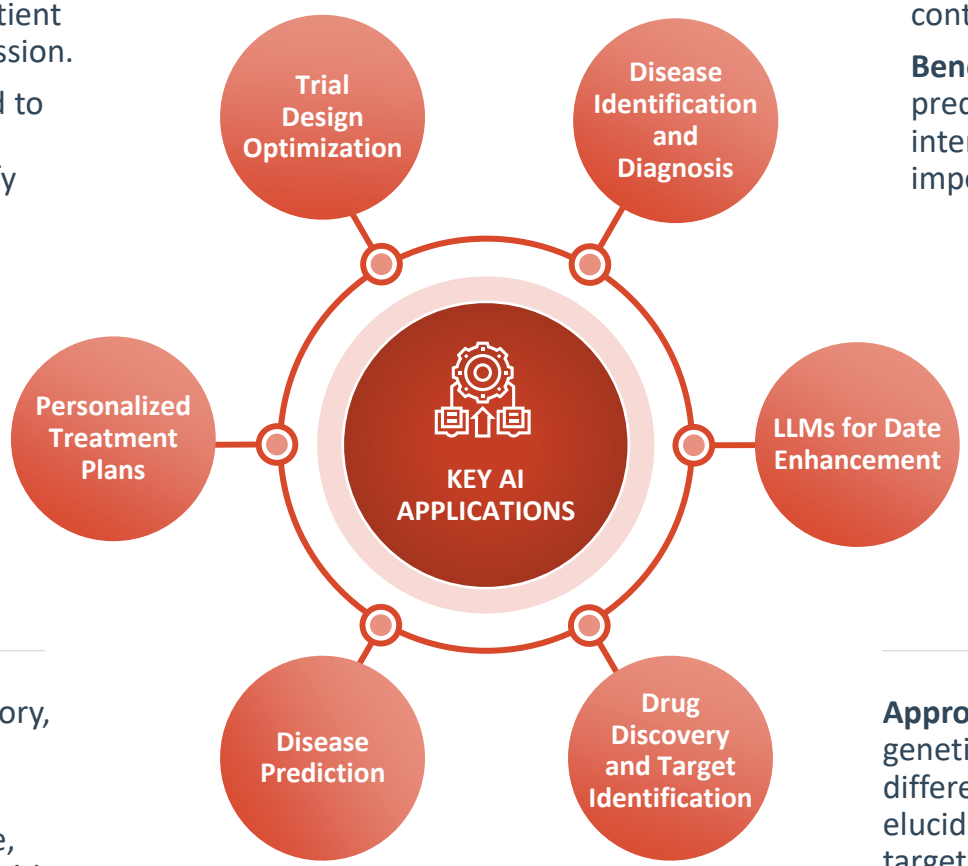
Benefit: Reduce resources and time needed to enroll, identify ideal clinical trial sites, enroll underserved populations, and identify patients most likely to benefit.

Approach: Based on similar patients, predict best course of action using (supervised and unsupervised) machine learning.

Benefit: More efficacious treatment plans, reduced side effects, and avoidance of unnecessary treatments.

Approach: Incorporate claims, EHR, laboratory, genetic, wearable databases to predict risk factors and disease

Benefit: Identify diseases at an earlier stage, personalize clinical check-in frequency, prioritize screening and preventative measures.



Approach: AIML from known patients and controls.

Benefit: Identify patients with improved prediction accuracy, incorporate complex variable interactions, and understand variable relative importance.

Approach: Harness innovations in large language models to improve accessibility to unstructured EHR content

Benefit: Convert EHR notes to structured content to improve available clinical depth and specificity, and support workflow improvements and the range of RWE applications**.**

Approach: Leverage publications, clinical data, and genetic repositories to identify proteins differentially expressed, network analysis to elucidate disease pathways, AI to identify drug targets

Benefit: Accelerate drug discovery, identify novel therapies, repurpose existing drugs.

Case Study

Using AIML to Identify clinical patients & trial cites

WHY AI?

- **Traditional recruitment methods** often result in **delayed trial operations.**
- **AI offers potential to improve precision and efficiency in site selection and patient recruitment**, crucial for expediting trials and potentially the approval process for innovative treatments.

An AI-Powered Workflow for Streamlined Recruitment

- An AIML model was developed to analyze how **key variables** such as patient volume, treatment history, referral network strength, and site connectivity interact and **contribute to successful recruitment for clinical trials.**
- Quantified and weighted social determinants and related parameters were used to develop a composite **ethnic diversity score** to align with diversity inclusion objectives for the trial.
- AIML outcomes and diversity scores metrics were combined to **recommend trial sites and HCPs** for engagement.

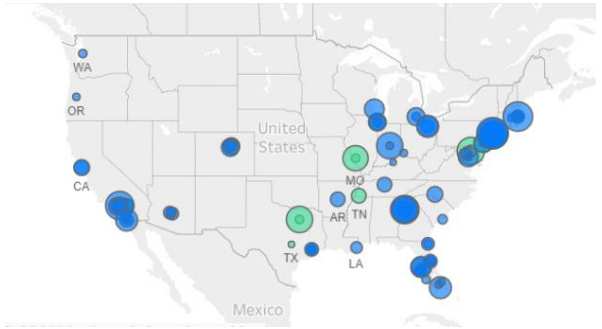
Learnings

- AI algorithms can be tailored to ensure key parameters of interest are considered while **improving the efficiency and effectiveness** of clinical trial establishment
- AI enabled trial optimization can be used to **increase visibility to patients meeting inclusion criteria** and to prioritize HCPs and sites for engagement

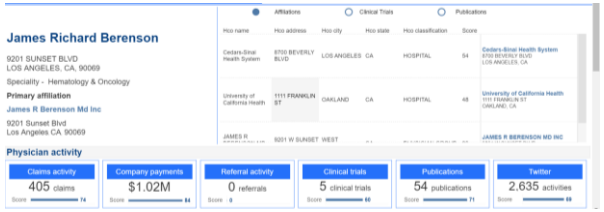
Future Applications

- The success of AI-powered trial recruiting process sets a precedent for its use in **accelerating recruitment** across different therapeutic areas. This could support the evolution of **personalized medicine and targeted recruitment.**

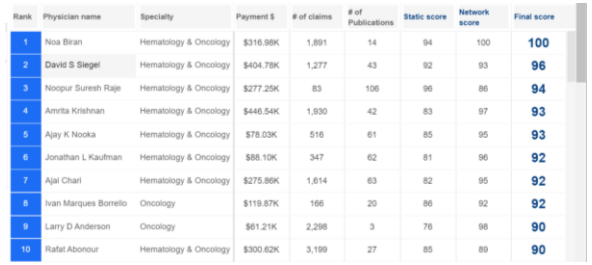
Site Recommendations



HCP | Recommended PI Profiles



HCP and Site Prioritization



Rank	Physician name	Specialty	Payment $	# of claims	# of Publications	Static score	Network score	Final score
1	Noa Biran	Hematology & Oncology	$316.98K	1,891	14	94	100	100
2	David S Siegel	Hematology & Oncology	$404.78K	1,277	43	92	93	96
3	Noopur Suresh Raje	Hematology & Oncology	$277.25K	83	106	96	86	94
4	Amrita Krishnan	Hematology & Oncology	$446.54K	1,930	42	83	97	93
5	Ajay K Nooka	Hematology & Oncology	$78.03K	516	61	85	95	93
6	Jonathan L Kaufman	Hematology & Oncology	$88.10K	347	62	81	96	92
7	Ajai Chari	Hematology & Oncology	$275.86K	1,614	63	82	95	92
8	Ivan Marques Borrello	Oncology	$119.87K	166	20	86	92	92
9	Larry D Anderson	Oncology	$61.21K	2,298	3	76	98	90
10	Rafat Abonour	Hematology & Oncology	$300.62K	3,199	27	85	89	90

AI has created an opportunity to rethink how we work…

What AI Is Good At

- ✓ **Summarizing Documents**
- ✓ **Extracting Facts and Insights**
- ✓ **First Draft Content Generation**
- ✓ **Idea Generator, Thought Partner**
- ✓ **Research Tool to Answer Questions**
- ✓ **Finding Patterns in Historical Information**

How can human domain experts leverage AI…

James Creeden

- AI to decipher very complex information – output to be used by human domain experts for treatment decisions

Francesco De Solda

- AI to summarize vast amounts of human sentiment information – helping domain experts shape communication strategies to meet customer expectations

Adrienne Lovink

- AI to find patterns in historical real world data to help experts optimize clinical operations

Abbreviations: xxx

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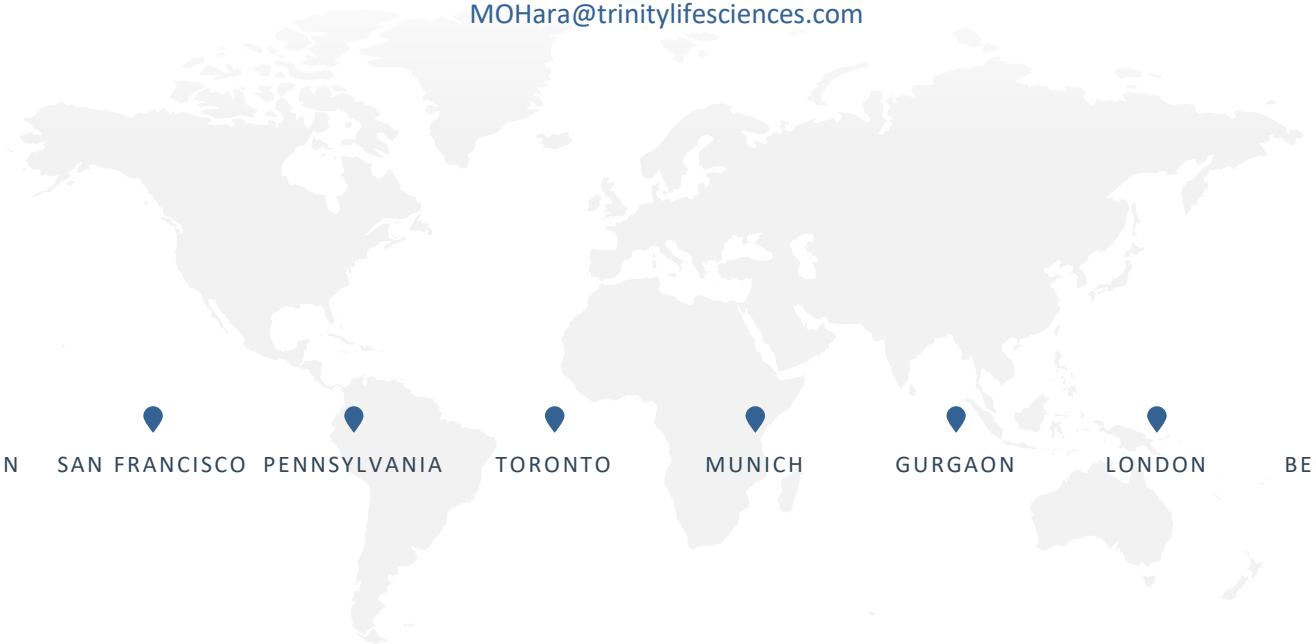

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