From Prediction to Activation:

Operationalizing Transformer-Based Predictive Patient Finding in Oncology GTM

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Metastatic Uveal Melanoma

Rare disease with only ~1,000 new patients annually in the US



- Immunocore treatment is for metastatic uveal melanoma (mUM).
- ~1,000 new metastatic patients per year in the US
- ~50% (~500 patients) are eligible based on HLA-A*02:01 positivity
- While Immunocore's treatment demonstrates strong efficacy in this biomarker-defined population, oncologists are often more familiar with broader, pan-tumor immunotherapies.
- **Objective**: Ensure engagement with the right physicians at the right time. Position Immunocore’s treatment as a targeted treatment option for eligible patients.

Summary of Results

How predictive alerts translated into measurable commercial impact

- **2.8x more accurate** than existing Machine Learning based model
- **3x more alert volume** than Lab and EMR alert providers
- **1.9x more digital engagement**, communicating to the doctor at the right time
- **2.1x more F2F rep visits** after alert and engaging with digital material
- **3-months lead time** gained before metastasis and key decision time-period
- **+10% gain in market share** amongst doctors who engaged with NPP and see rep F2F

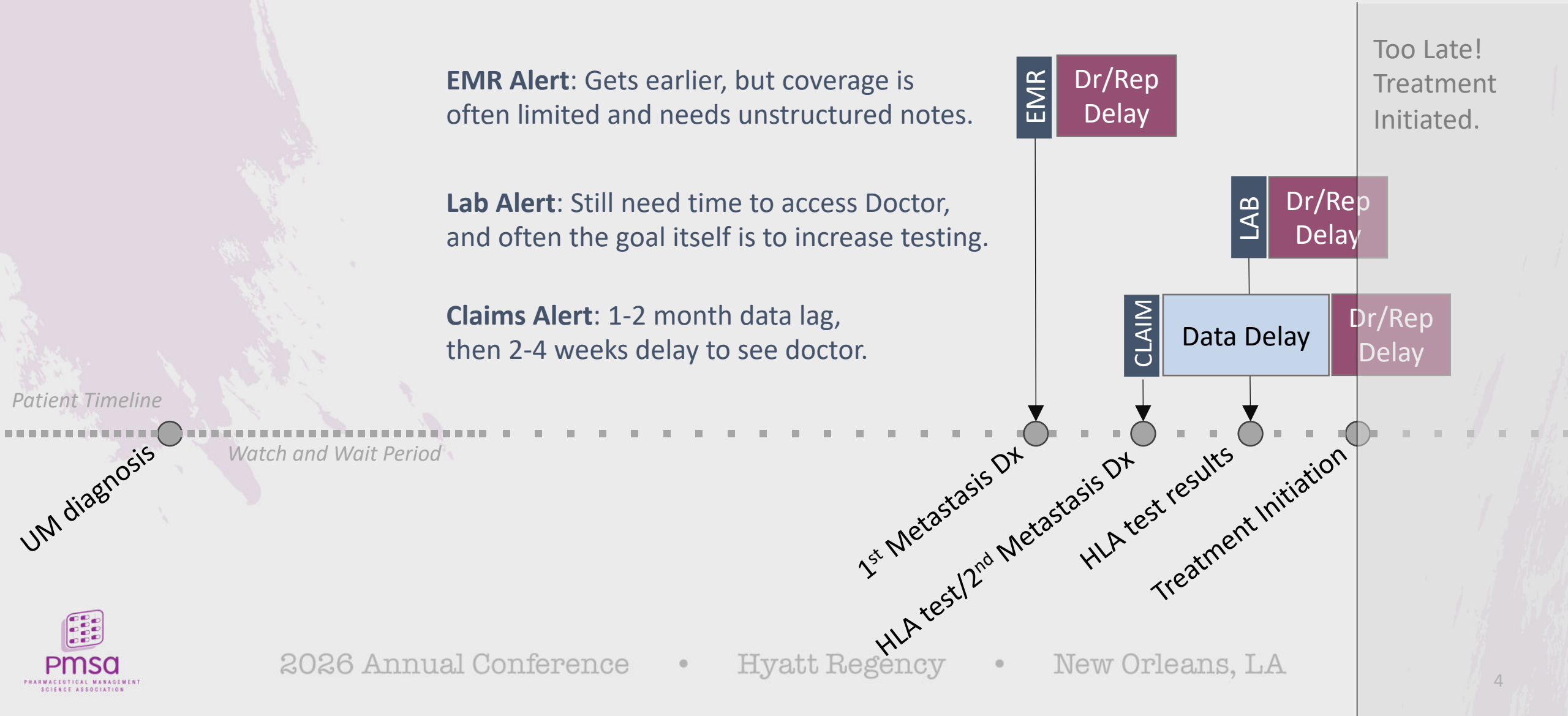
Existing Alerts Have a Limited Window for Action

Data delays and physician access delays lead to missed opportunities

EMR Alert: Gets earlier, but coverage is often limited and needs unstructured notes.

Lab Alert: Still need time to access Doctor, and often the goal itself is to increase testing.

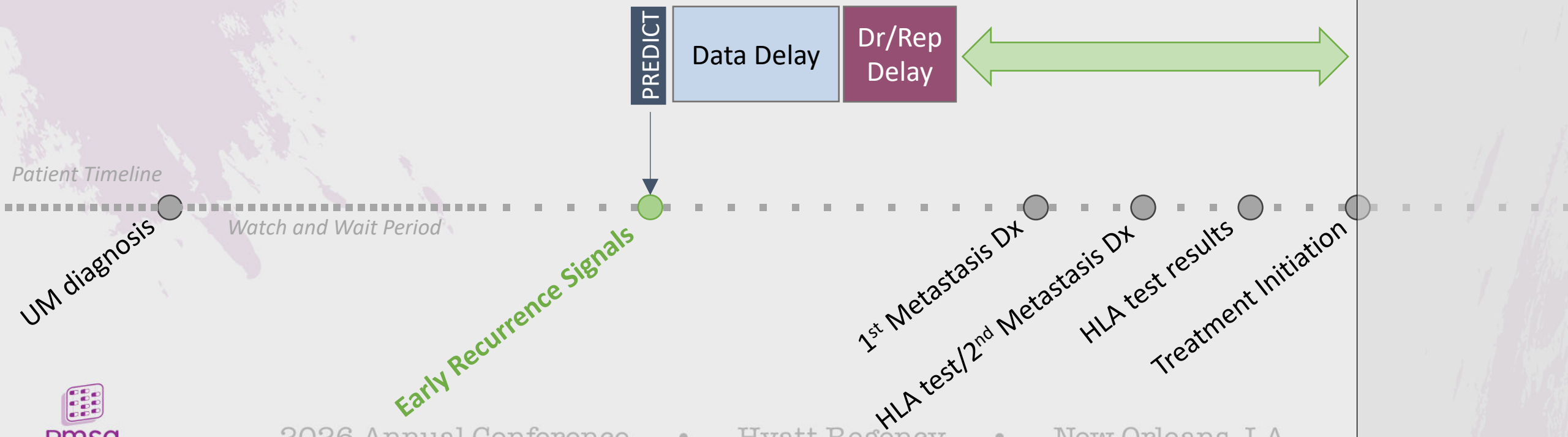
Claims Alert: 1-2 month data lag, then 2-4 weeks delay to see doctor.



The Ideal Use Case for Predictive Alerts

Overcome data lag and access delays to engage before key decisions are made

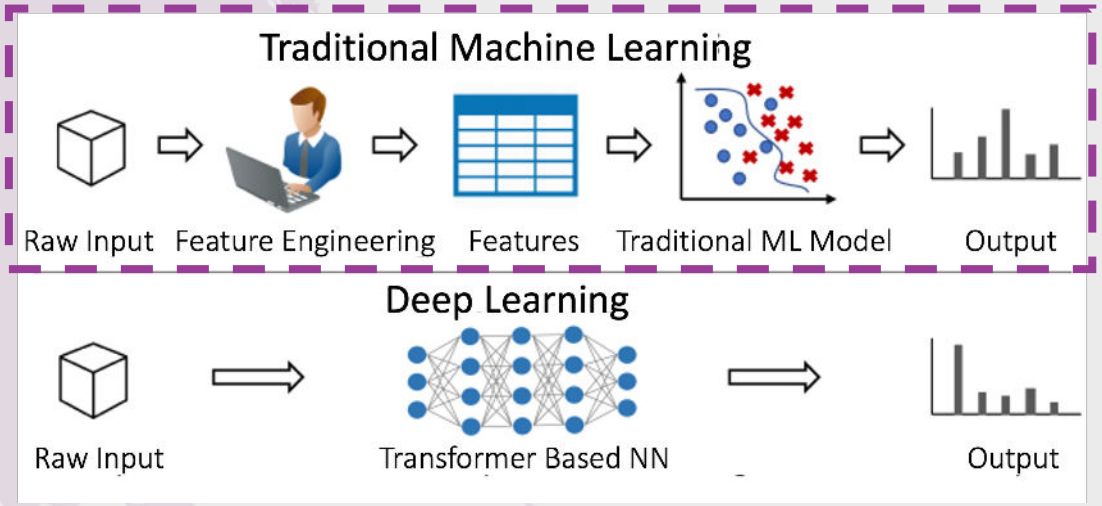
Predictive Alert: Predict 3-6 months earlier.
Gain's time for the patient to get biomarker tested.
Gain time to influence before treatment decision.



Limitations of Traditional ML Predictive Alerts

Manually configured on a fraction of the of data creates an incomplete picture

Build and iterate over ~6-9 months

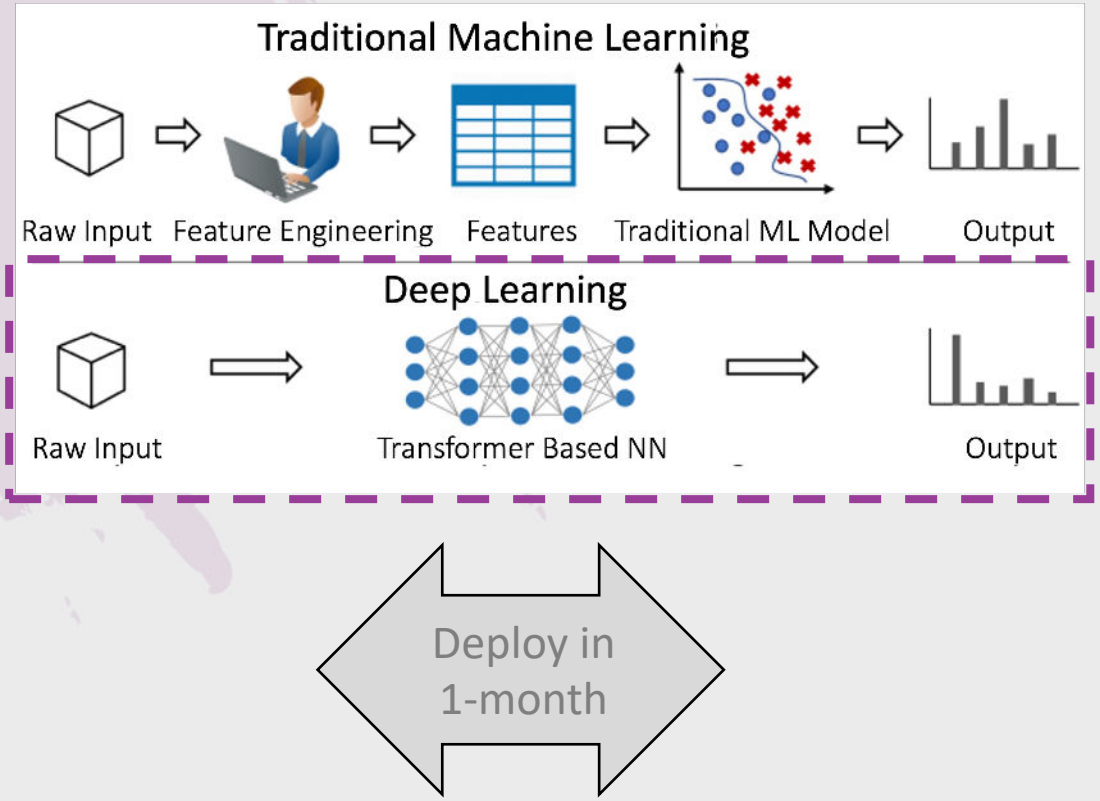


Can deliver results, but:

- Takes a long time to develop
- Highly manual
- Dependent on individual expertise
- Utilizes only a fraction of the data
- Misses temporal/complex signals

Benefits of Transformer based Prediction

Replaces manual steps, utilizes more data, and delivers alerts earlier



Faster, Deeper, More Predictive :

- Faster to build, easier to scale
- No manual feature engineering
- Learns from the full patient journey
- Captures timing, sequence, context
- Surfaces signals we don’t know to look for

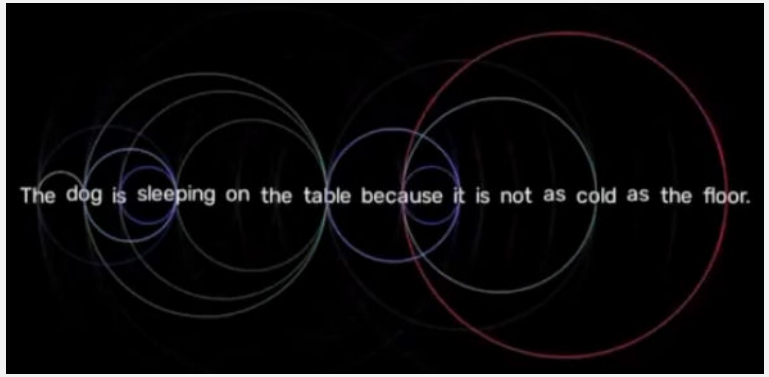
What is a Transformer Model?

Learns patterns from entire sequences, capturing context, timing, and relationships in data.

Language Domain:

Task: Understand and generate text

How: Reads words as sequences.
Relates words in context.
Builds meaning across the full text.



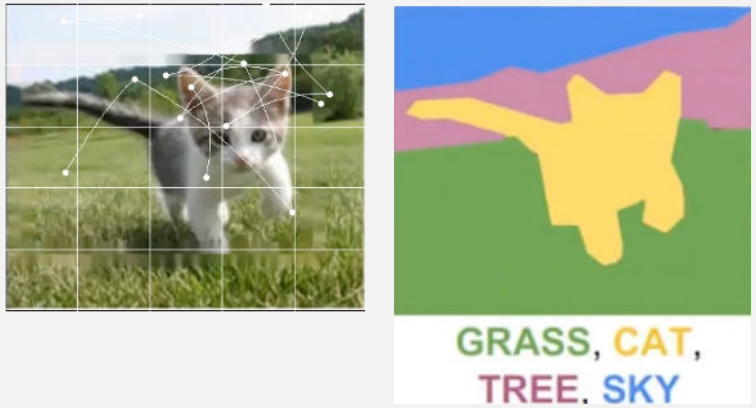
Example: LLM's, Generate Text, Summarise, Q&A, Translation

In Market: Claude, ChatGPT

Image Processing Domain:

Task: Recognize objects in image

How: Image split into patches.
Compares context between regions.
Identifies patterns across the image.



Example: Object recognition, Tumour Detection

In Market: Vision Transformer (ViT)

Patient Journey Domain:

Task: Predict patient progression

How: Reads patient events as a sequence. Connects events over time. Identifies progression/risk patterns.

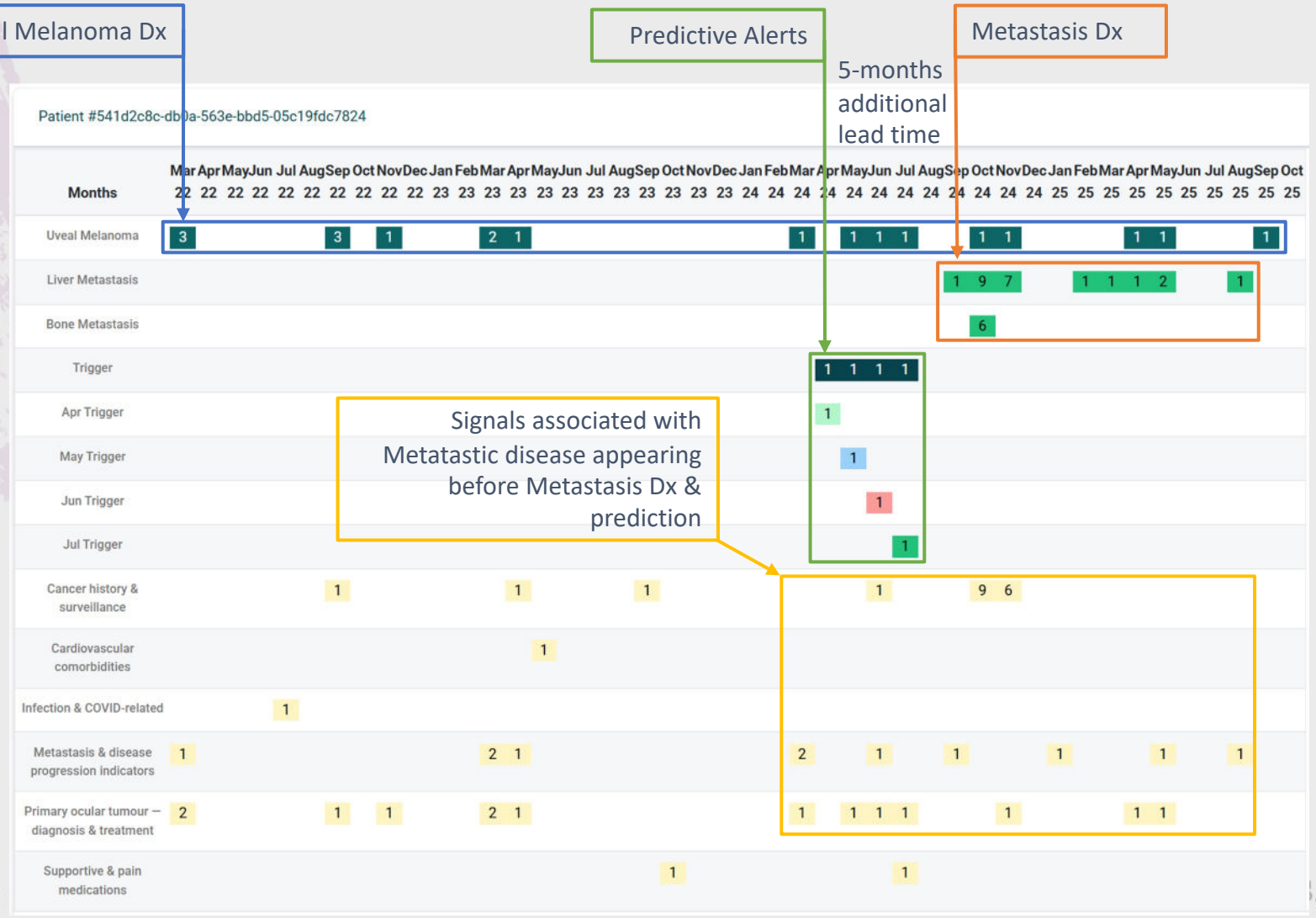


Example: Early identification of high-risk patients

In Market: Prospection

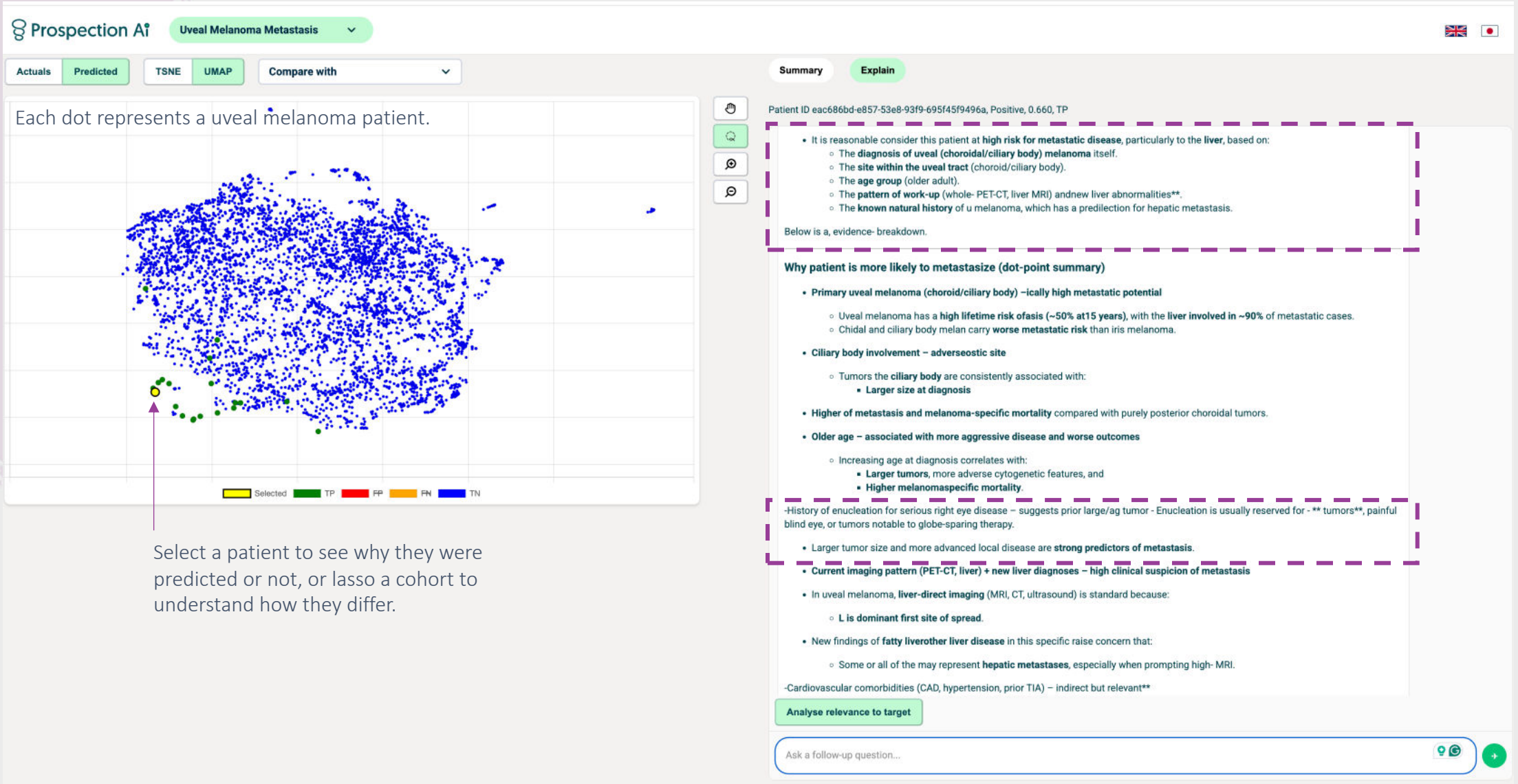
Predicting Metastatic Uveal Melanoma

Evaluate all UM patients, identify those likely to metastasize in the next 6-months



Explaining the ‘Why’ to build confidence

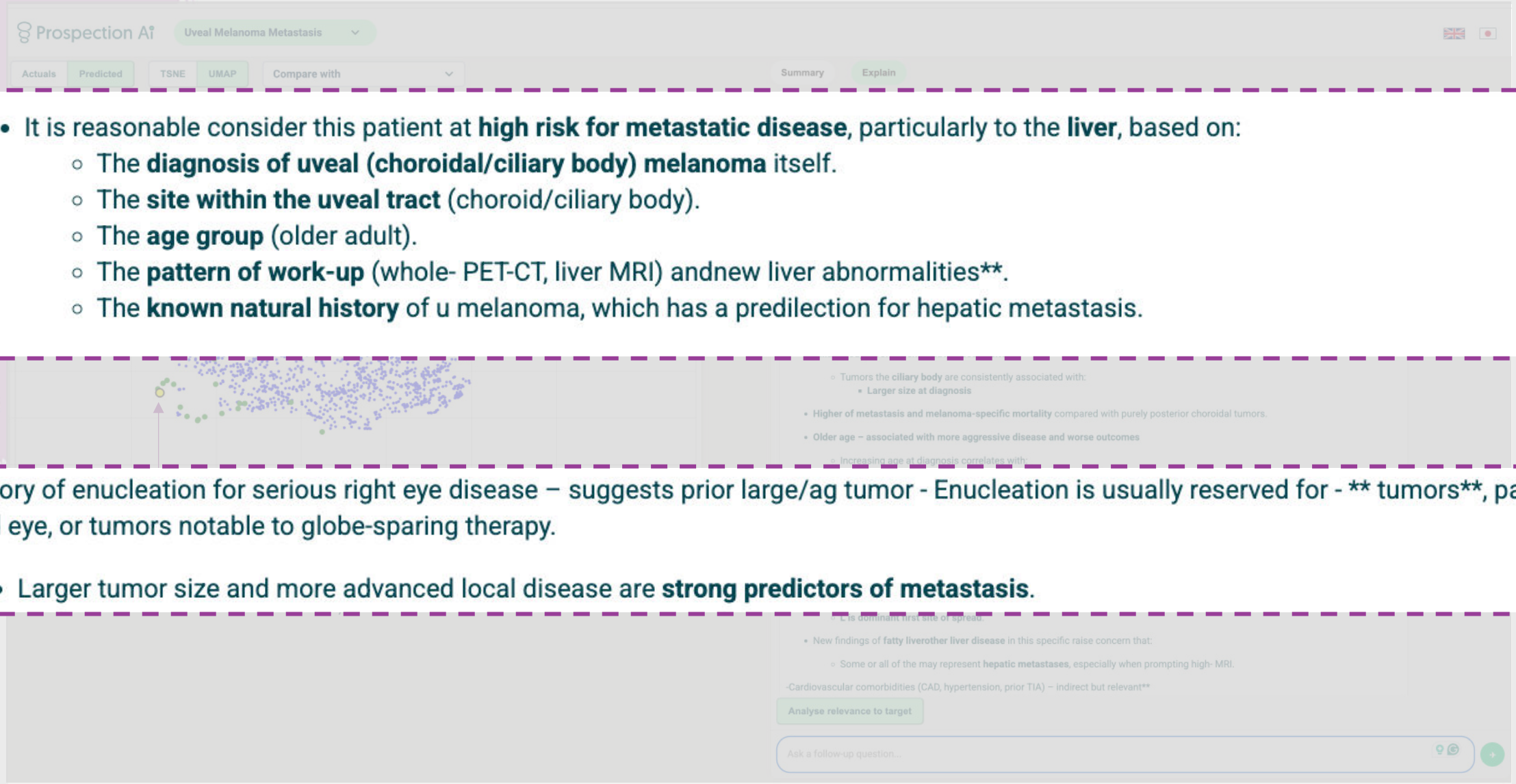
Clear clinical drivers behind each prediction enable trust and adoption



Select a patient to see why they were predicted or not, or lasso a cohort to understand how they differ.

Example Drivers Identified by the Model

Age, liver testing patterns, disease progression pattern, and history of enucleation



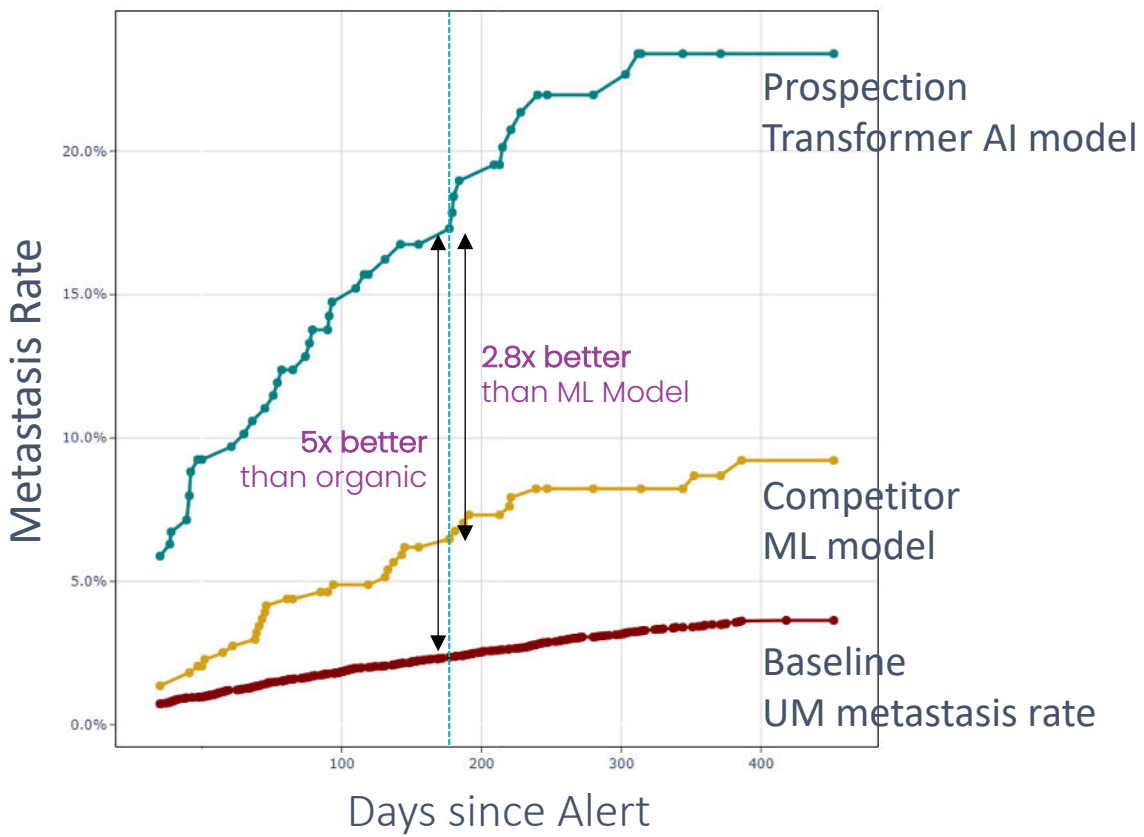
- It is reasonable consider this patient at **high risk for metastatic disease**, particularly to the **liver**, based on:
  - The **diagnosis of uveal (choroidal/ciliary body) melanoma** itself.
  - The **site within the uveal tract** (choroid/ciliary body).
  - The **age group** (older adult).
  - The **pattern of work-up** (whole- PET-CT, liver MRI) andnew liver abnormalities**.
  - The **known natural history** of u melanoma, which has a predilection for hepatic metastasis.

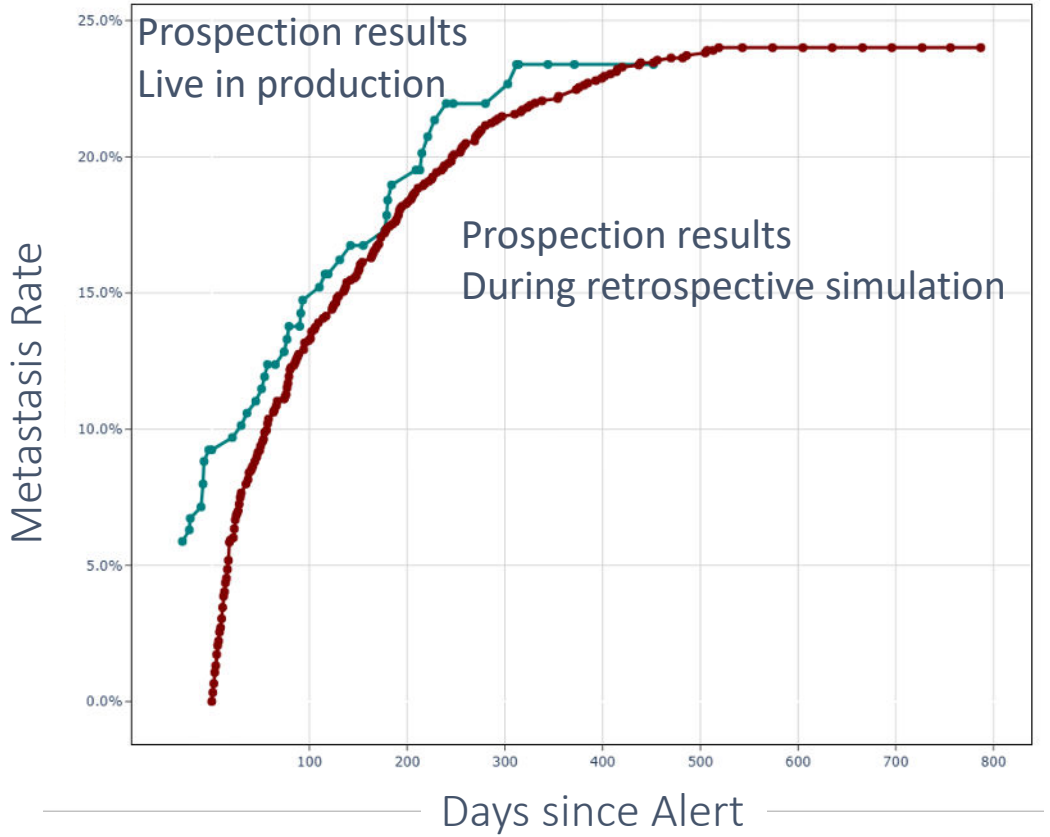
-History of enucleation for serious right eye disease – suggests prior large/ag tumor - Enucleation is usually reserved for - ** tumors**, painful blind eye, or tumors notable to globe-sparing therapy.

- Larger tumor size and more advanced local disease are **strong predictors of metastasis**.

Prediction Accuracy

5× uplift vs baseline metastasis rate, and 2.8× improvement over ML model





Activation and Impact

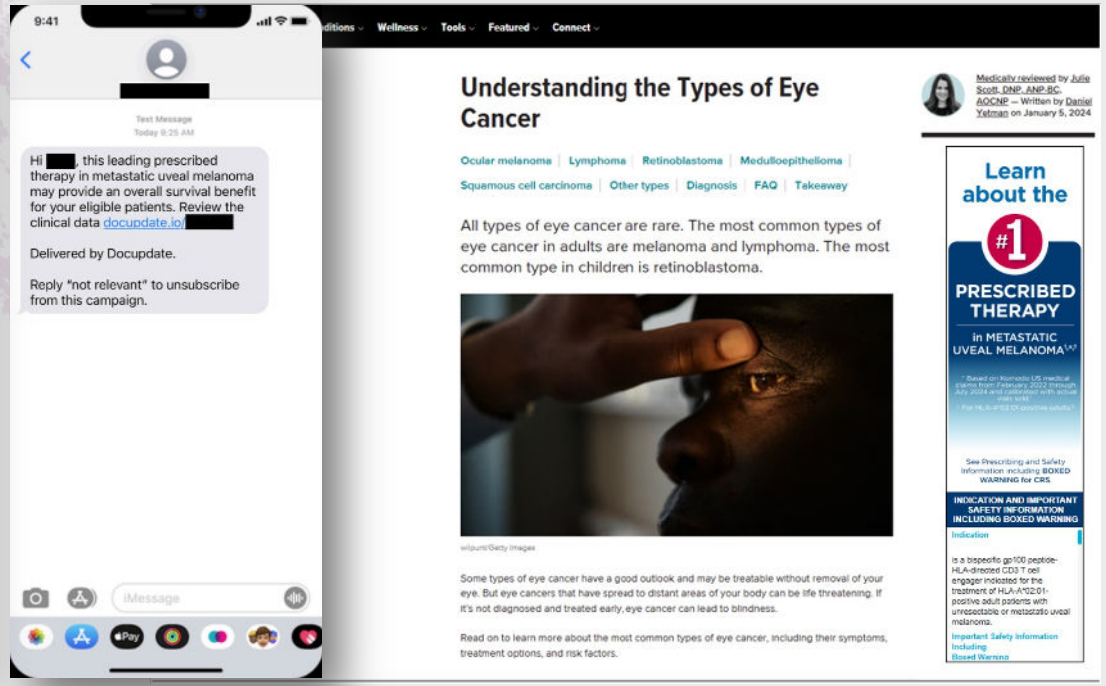
After the Alert: Digital and F2F activation

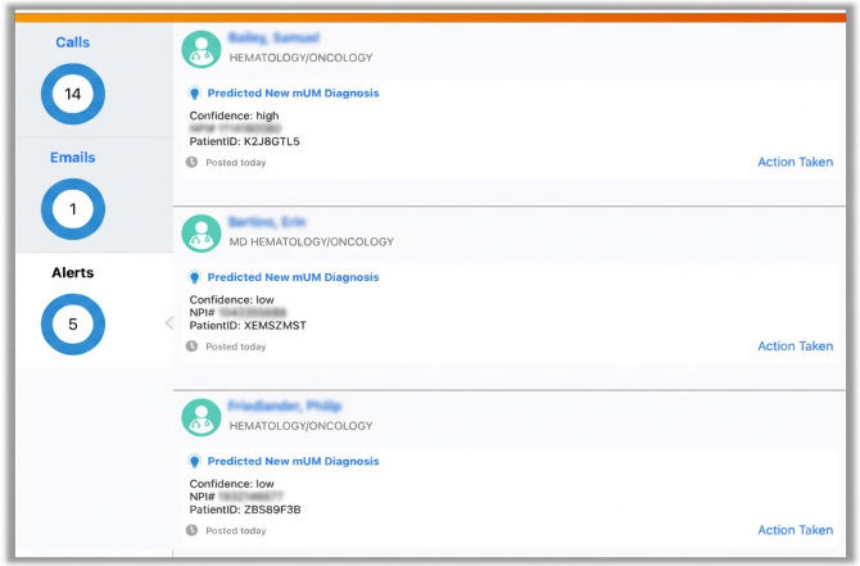
Digital activations followed by targeted rep engagements

Digital activation across Medical Websites, SMS, email, programmatic EHR channels - driving engagement via clicks, opens, and impressions.

F2F activation via Veeva Suggestions, with reps responding positively to increased actionable alerts.

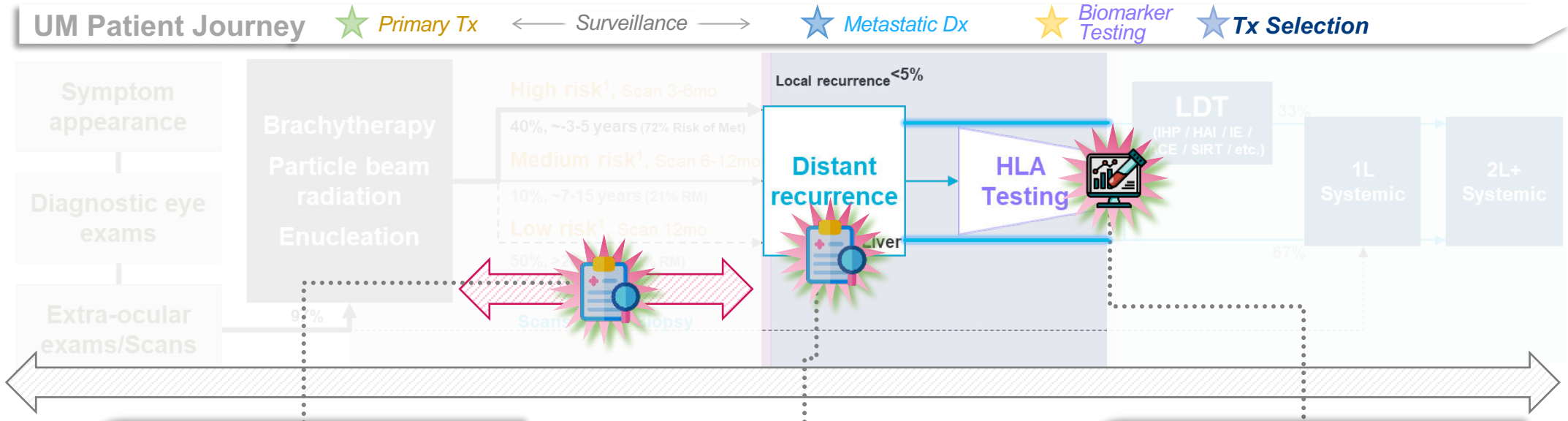






Alerts at Critical Moments in the Patient Journey

Aligned to decision windows, with clear rep expectations on timing and accuracy



Predictive Mets (Claims)

Predictive	*Source:* **Claims**

- Identifies **UM patient likely to metastasize** within 6 mos
- Reports managing HCP (ocular onc, med onc, etc.)

New Mets Dx (EMR)

Deterministic	*Source:* **EMR**

- Identifies **newly diagnosed mUM patient**
- Reports managing med onc

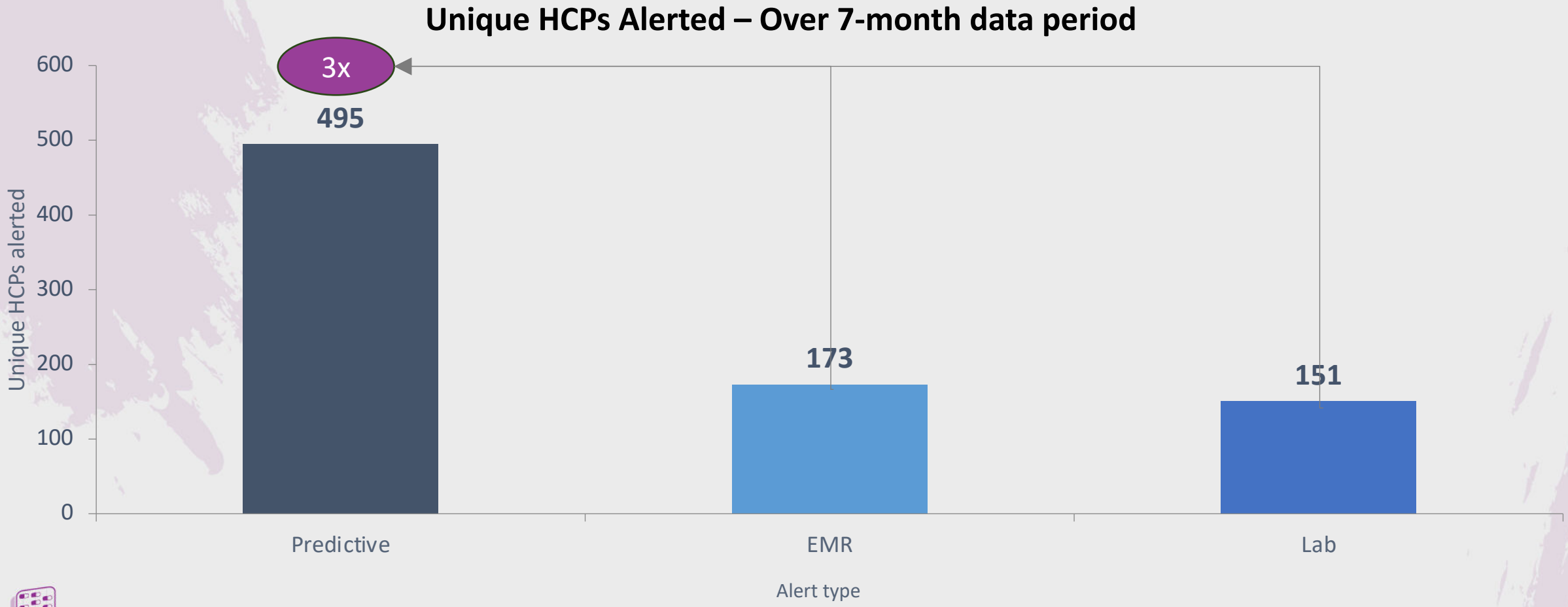
HLA (Lab Data)

Deterministic	*Source:* **Lab Data**

- Identifies **(m)UM patient with HLA test**
- Reports ordering med onc
- Alert flavors:
  HLA+ | HLA- | **Wrong Test**

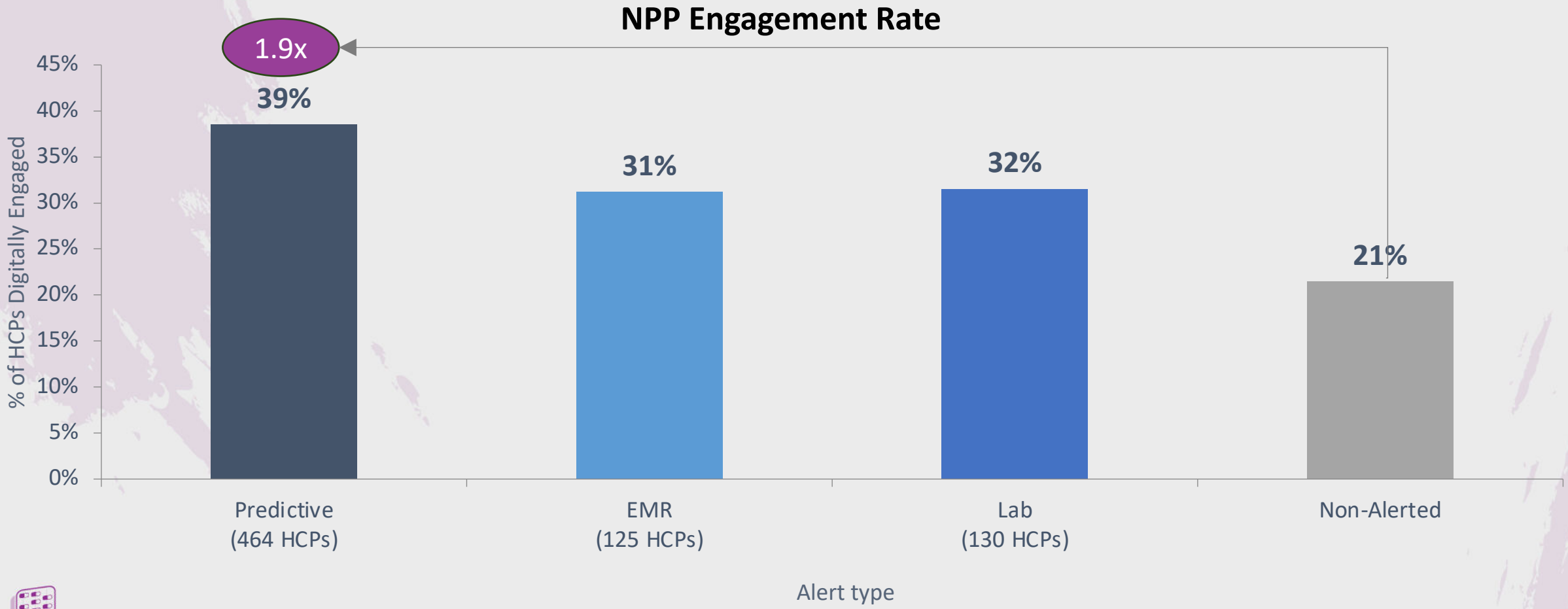
Alert Coverage

Predictive alerts reached ~3x more doctors than EMR or Lab-based alerts



Digital Engagement Rates

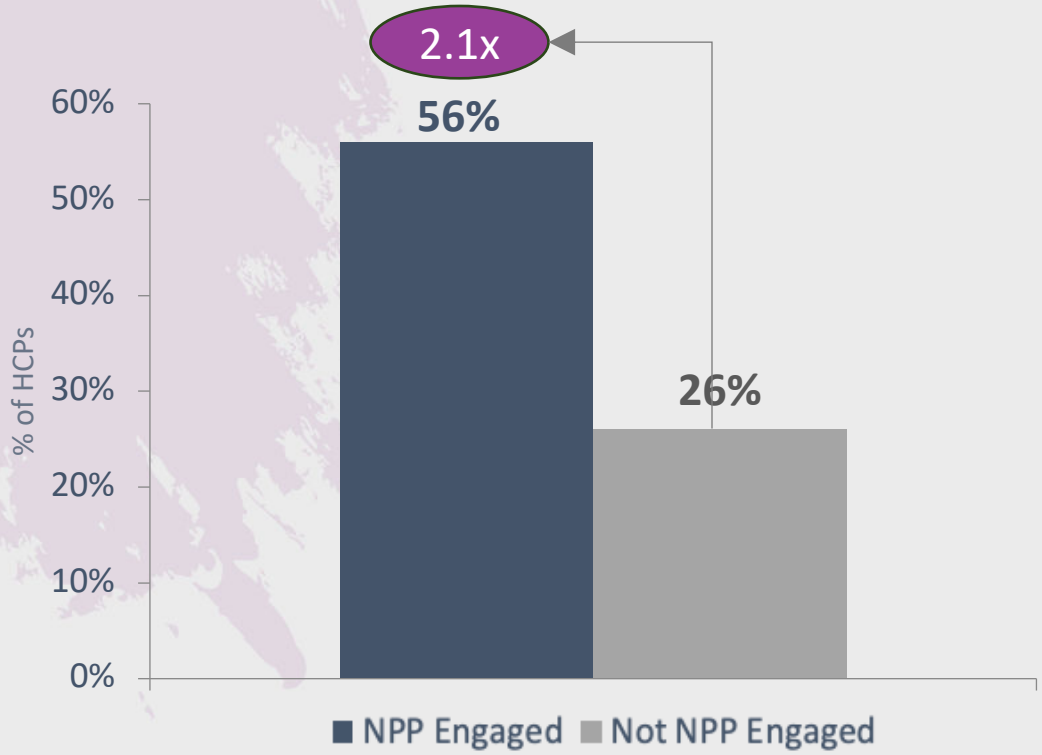
Doctors were ~2x more likely to click through or open the digital content



Rep Access to Digitally Engaged Doctors

Digitally engaged doctors were ~2× more likely to meet with reps F2F

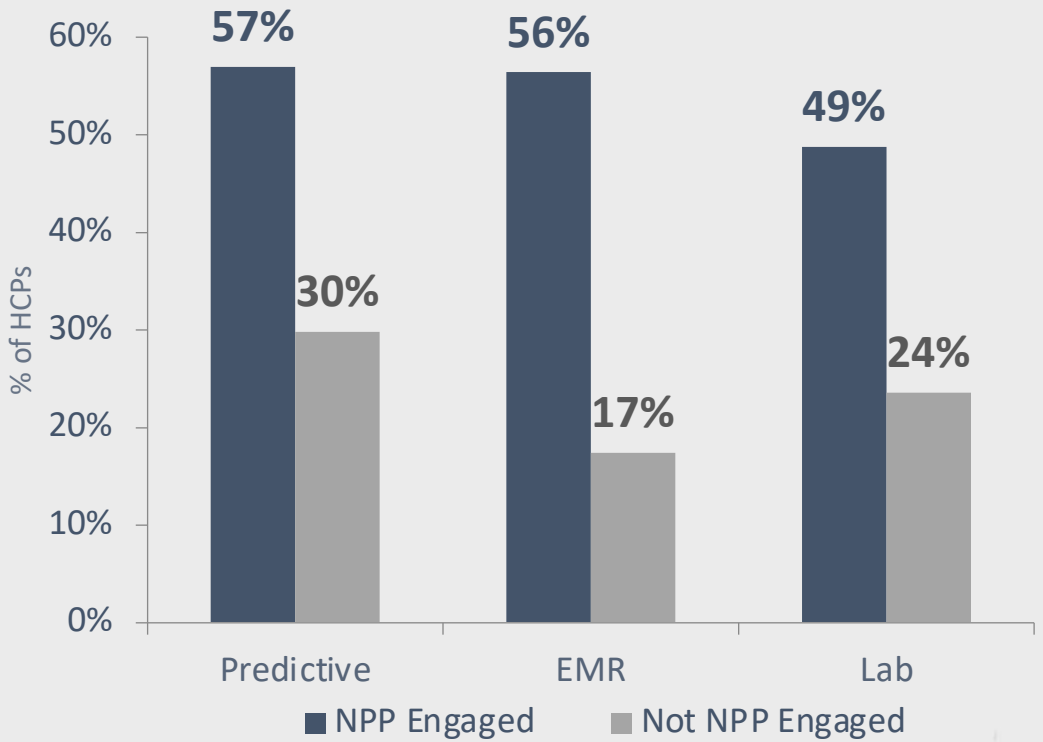
F2F Call Rate - All alerts Combined



All Alerts Combined

F2F Call Rate by alert type

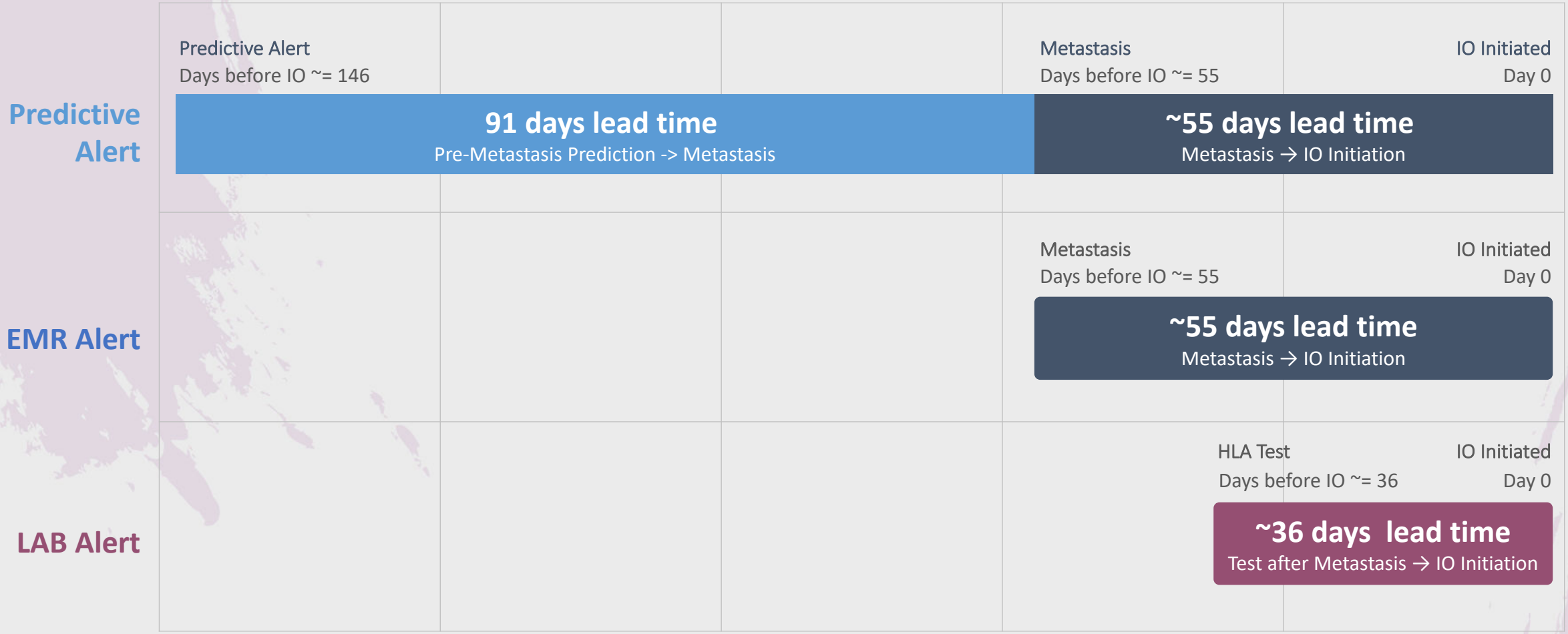
Same uplift in F2F with NPP trend seen across all alert types.



Alert type

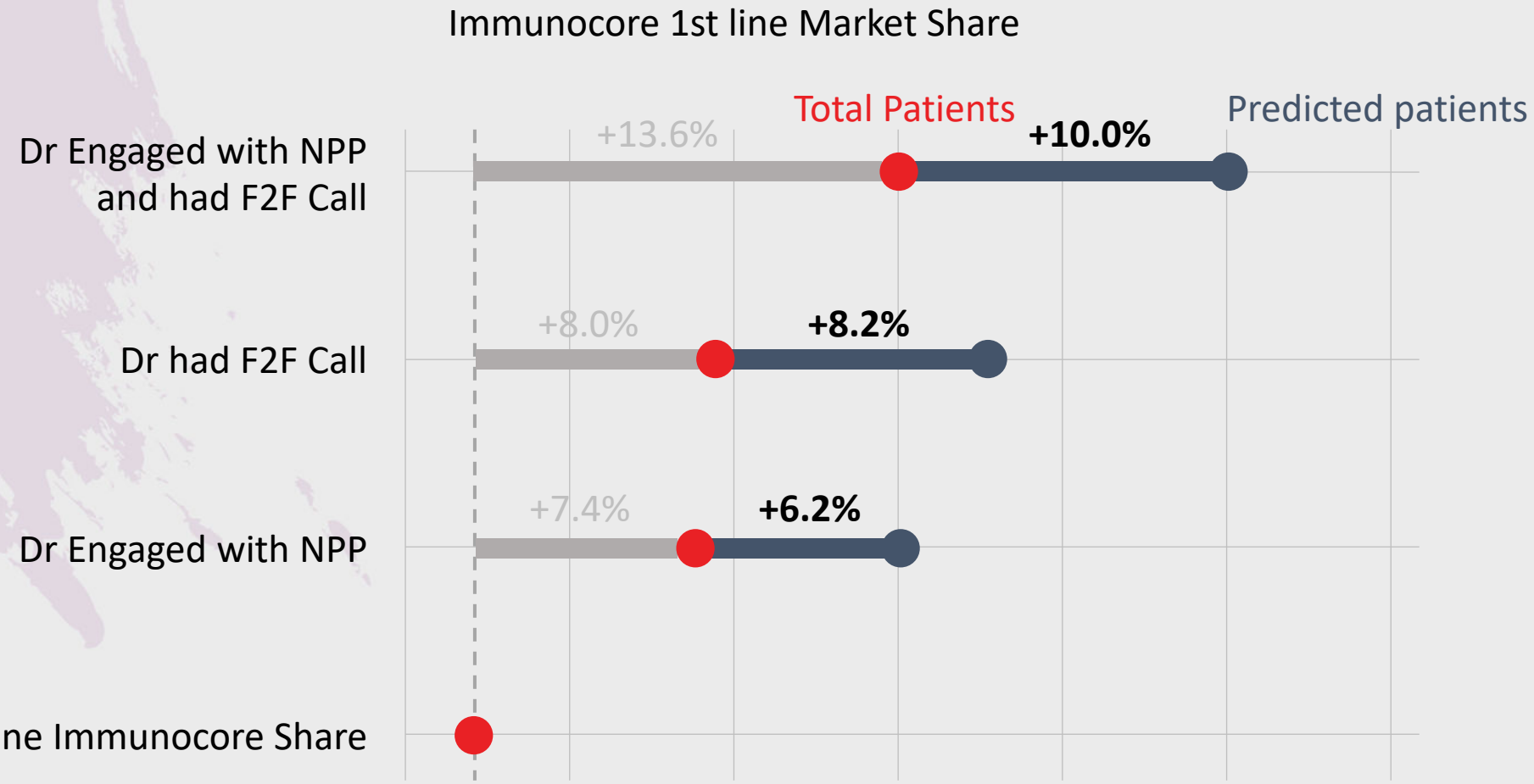
Lead Time Advantage

3-month lead to metastasis and 4.6-month lead to treatment decisions



Market Share Impact

+10% increase in 1st Line share among doctors receiving coordinated engagement



Overall Impact

Earlier predictions, broader reach, and better timing driving higher engagement and market share

- **2.8x more accurate** than existing Machine Learning based model
- **3x more alert volume** than Lab and EMR alert providers
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Immunocore: Lessons, and what next

Learnings

- **Alerts optimize timing** of HCP engagement driving market share, but opportunity to optimize execution exists
- Consistency: **action higher percentage alerts**
- Quality: we know where and when to go, can we help **inform what to say**

Next Steps

- Reinforce what works and provide field team with reasons to believe
- Integrate alerts with HCP intelligence to scale impact

Predictive Patient Finding

Predicted Patients + HCPs to enable more effective F2F, Digital, and DTC promotion

Input Datasets

Open + Closed Insurance Claims Data

Prescriber characteristics

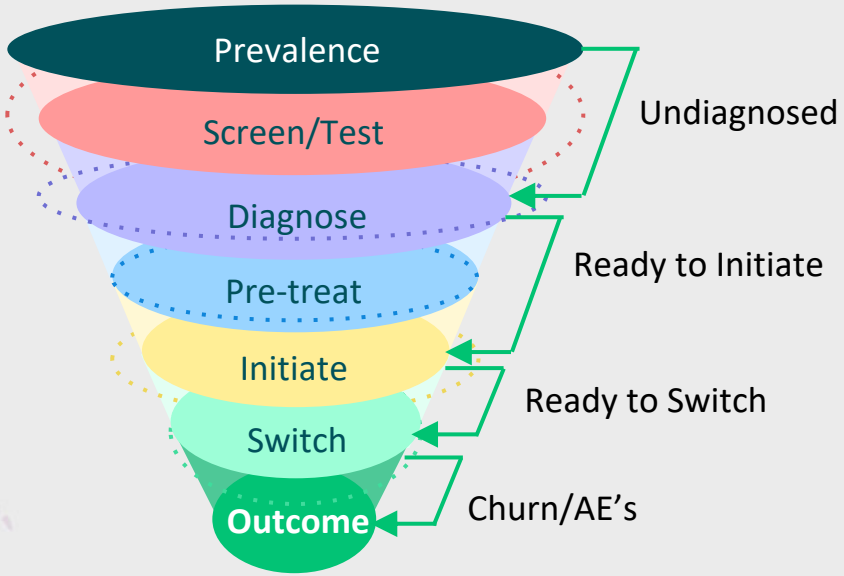
Lab test data

Genomics data

EMR Data

Social Determinants

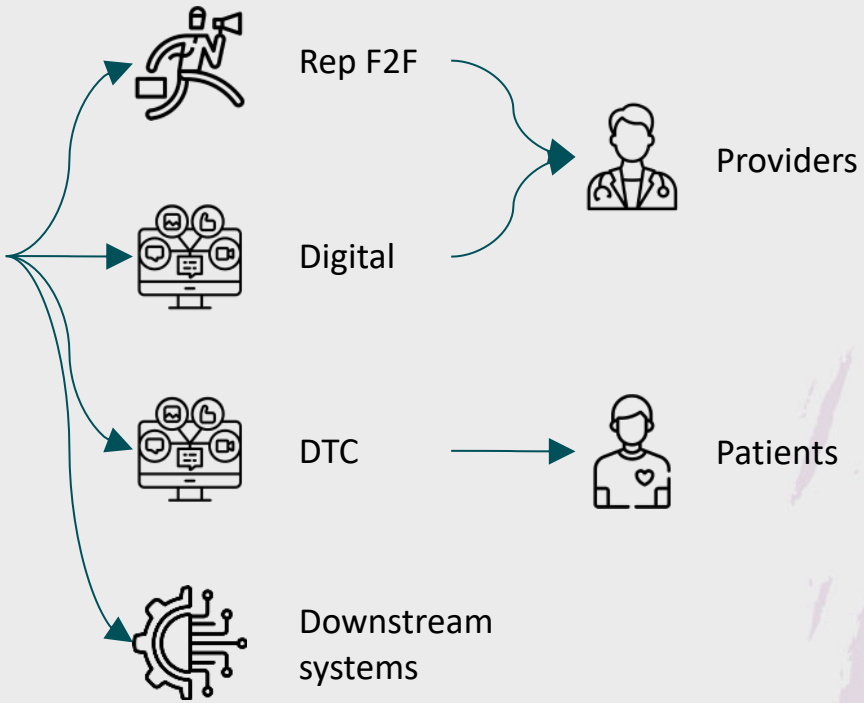
Transformer Based Predictions



Weekly/Monthly list of predicted:

- NPI, Provider Name, Specialty,
- Patient Token, Confidence,
- Reason for Prediction

Commercial Application



Thank you!

Contact details:

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