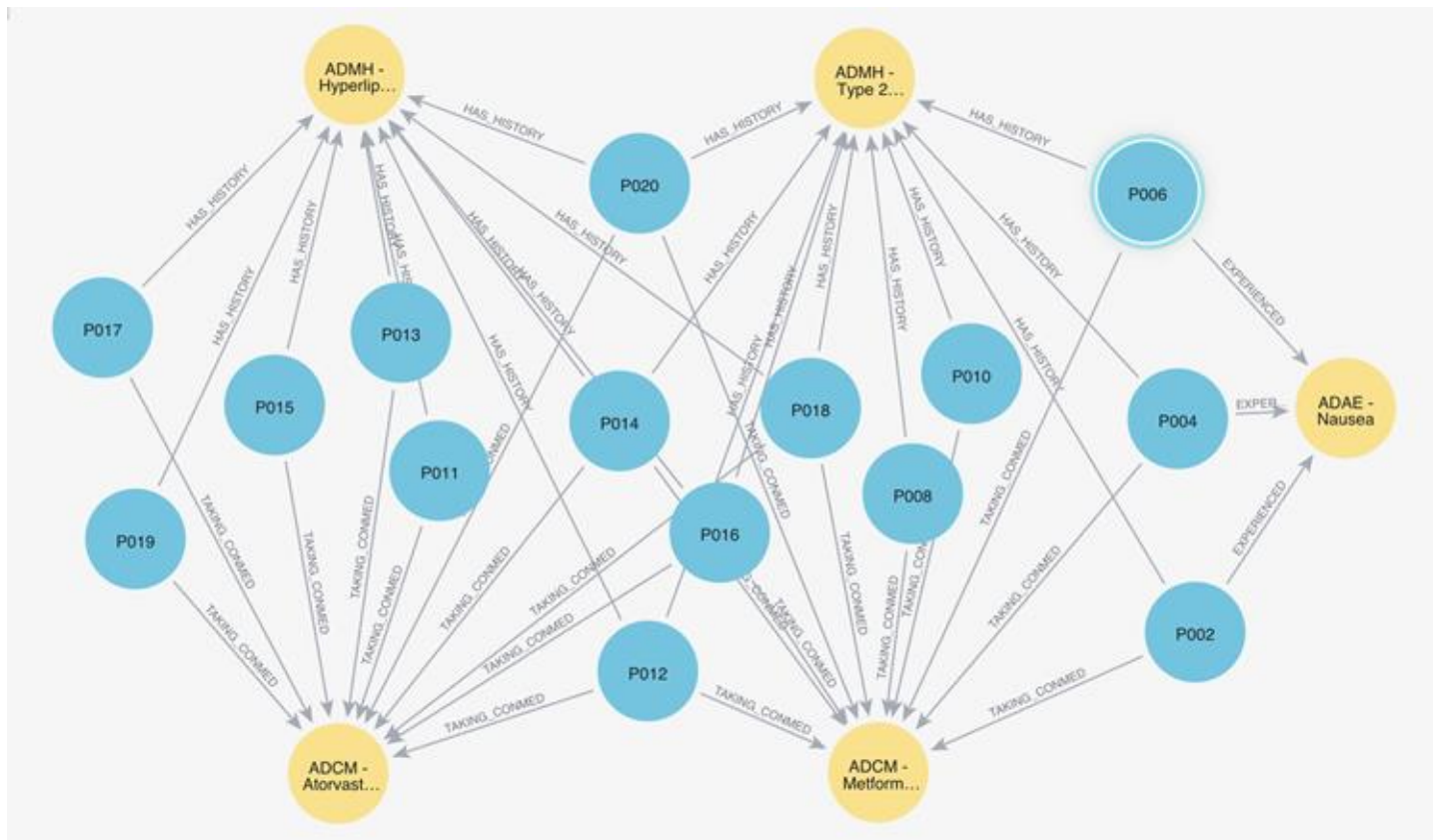


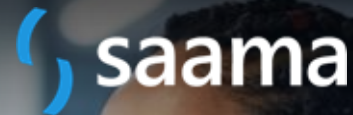


Unveiling Powerful Patient Data Insights Through Graph Database

Patient Data in Graph Database



Clinical Data Lineage in Graph Database

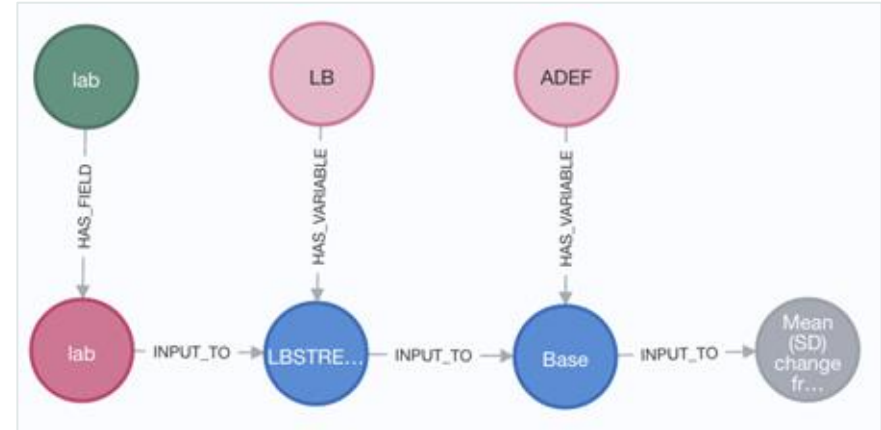
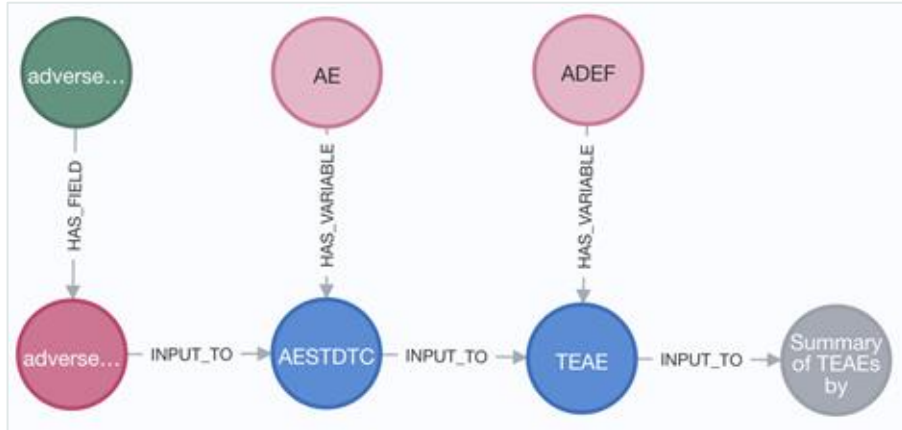


- **End-to-End Traceability:** A single Cypher query can trace an ADaM outlier back to the raw source data point.
- **Impact Analysis:** If a source data format changes, the graph immediately shows which SDTM and ADaM nodes are affected.
- **Complex Cross-Domain Queries:** Easily query relationships between Concomitant Meds (CM) and Adverse Events (AE) without complex SQL joins.

Lineage & traceability - Programs



Lineage & traceability - Specifications





Bridging Structured ADaM Domains with Unstructured Medical Insights



Connects **ADaM domains (ADSL, ADAE, ADCM)** to maintain statistical traceability and regulatory standards.



Links clinical "**row data**" directly to **unstructured sources** like medical journals, protocol PDFs, and investigator brochures.



Enables AI to **answer complex safety and efficacy questions** by grounded reasoning.



In GraphRAG, when an LLM is asked a question, it **generates a Cypher query to fetch the exact context.**



Neo4j Graph Data Science uses 65+ algorithms to **pinpoint outliers** outside established clinical clusters and patterns

Siloed Data Sources TO Unified Knowledge Graph



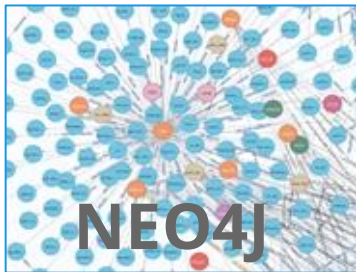
Raw Data



SDTM Datasets



Protocol Document



Unstructured Data



Investigator Brochure

GraphRAG Engine

GDS Algorithms



Vector Search



AI Powered Discovery and Use Cases



Key Use Cases



Safety Signal Detection



Trial Optimization



Patient Stratification

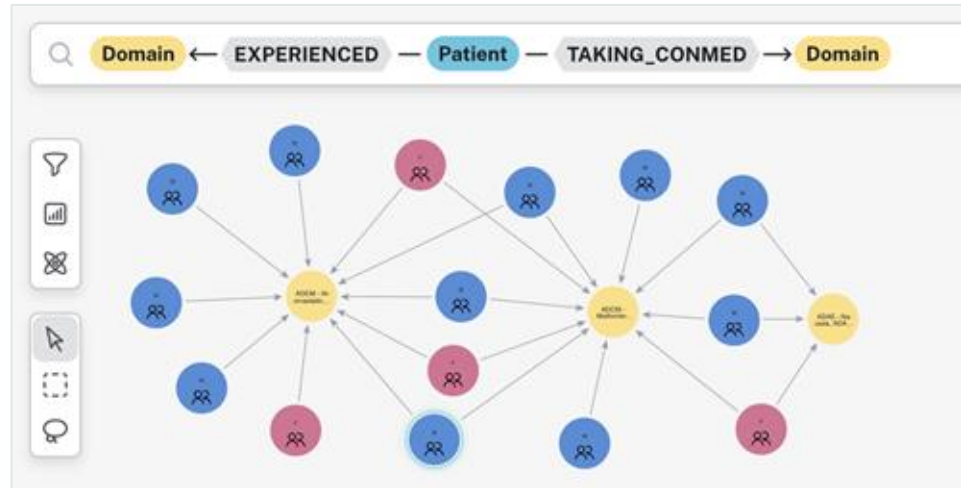
AI-Generated Answers

1. Identify Patient Cohort (ADSL)
2. Correlate non-responders with specific markers via GDS
3. Link to Protocol PDF
4. Link to Medical Journals detailing gene-drug interactions

Neo4j Bloom - Visualizing the 'AI-Driven' Graph

Overview:

- ★ Low-Code Graph exploration
- ★ The “Eyes” of your GDS Pipeline
- ★ Natural Language Search
- ★ Rule Based Styling for Deep exploration
- ★ Highlight outliers



Transforms **abstract mathematical embeddings** into **tangible visual patterns** allowing experts to validate AI-detected anomalies through intuitive navigation

Breaking Data Silos with Graph Analytics



The Problem: Clinical intelligence is fragmented across silos

The Limitation: Traditional RDBMS (rows/columns) obscures the complex, multi-dimensional interactions between biomarkers, concomitant medications, and patient outcomes.

The GDS Solution: Neo4j GDS creates a "Knowledge Graph" that connects disparate data points to uncover non-obvious patterns.

Core Objective: Move from descriptive data (what happened) to predictive analytics (what will happen in this trial)

Similarity (Trial Site Selection): * Application: Compare potential trial sites based on historical performance, patient demographics, and investigator expertise to find the "best-fit" locations.

Algorithm: Node Similarity (Jaccard) or K-Nearest Neighbors (KNN).



We've laid the groundwork. We are now ready for the 'peer review' portion of the session.