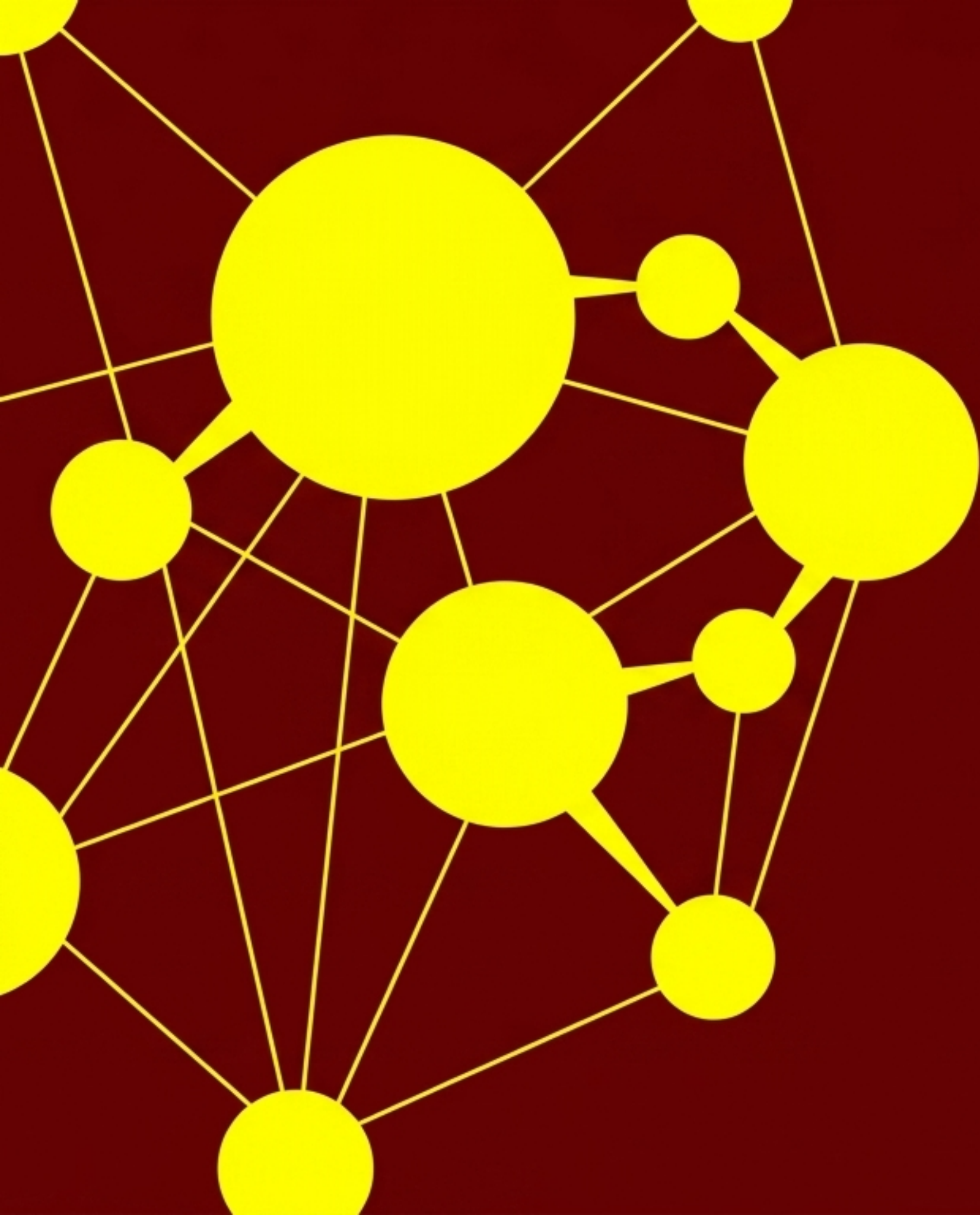




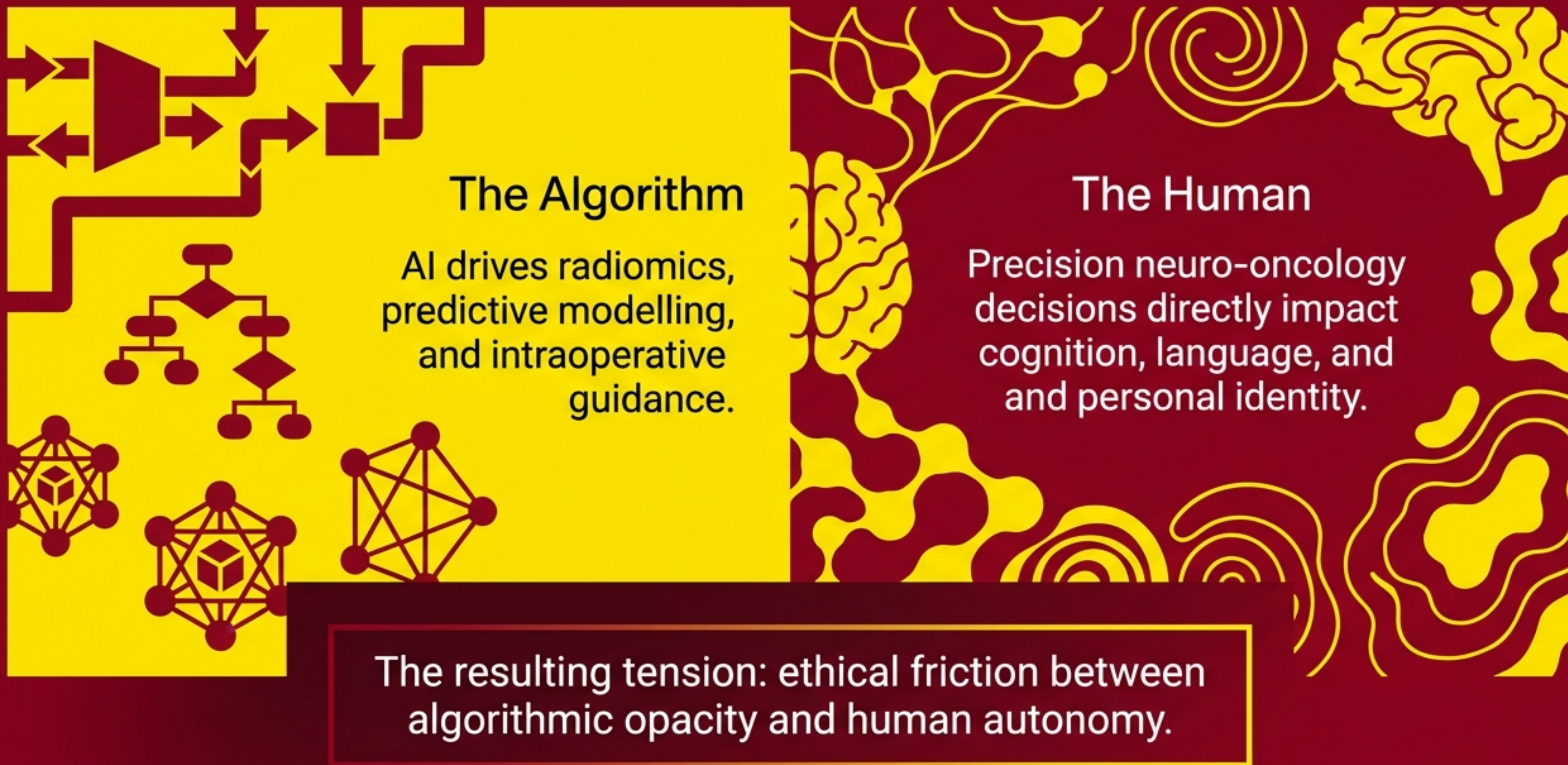
Ethics in Precision Neuro-Oncology: A Systematic Review of Empirical Evidence on Autonomy and Consent in AI-Guided Neurosurgery

Tomasz Tykocki

BRAIN. Broad Research in Artificial Intelligence and Neuroscience

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The Intersection of Artificial Intelligence and Human Identity

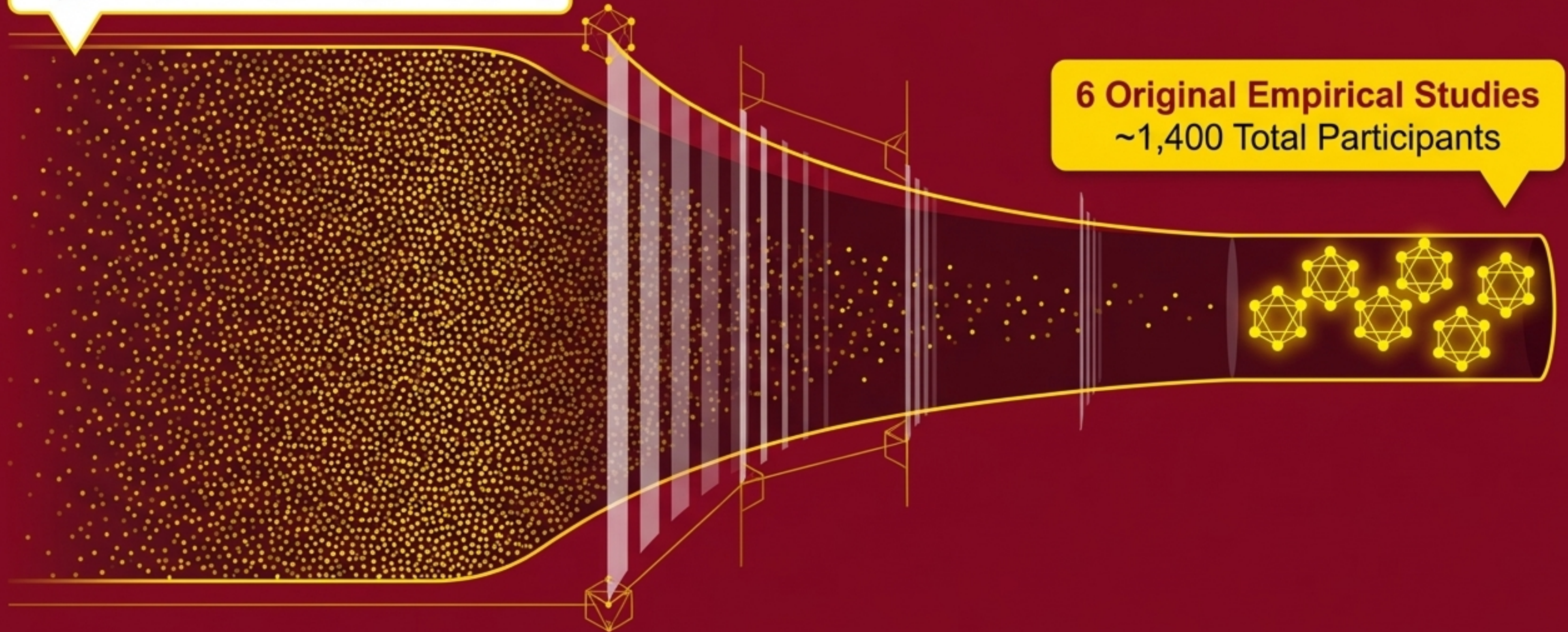


Distilling the Empirical Evidence Base

Decades of theoretical discourse, yet severe scarcity of real-world data.

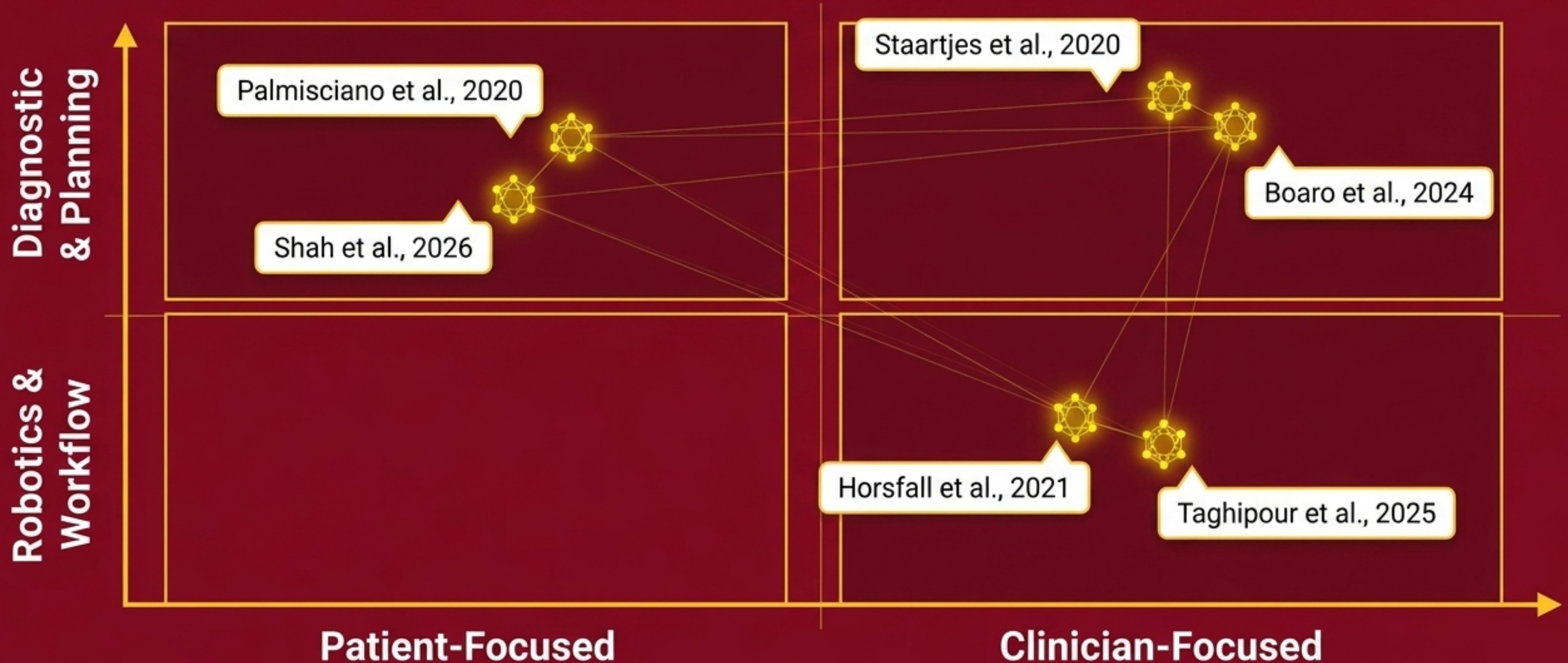
1,374 Initial Records Identified

6 Original Empirical Studies
~1,400 Total Participants

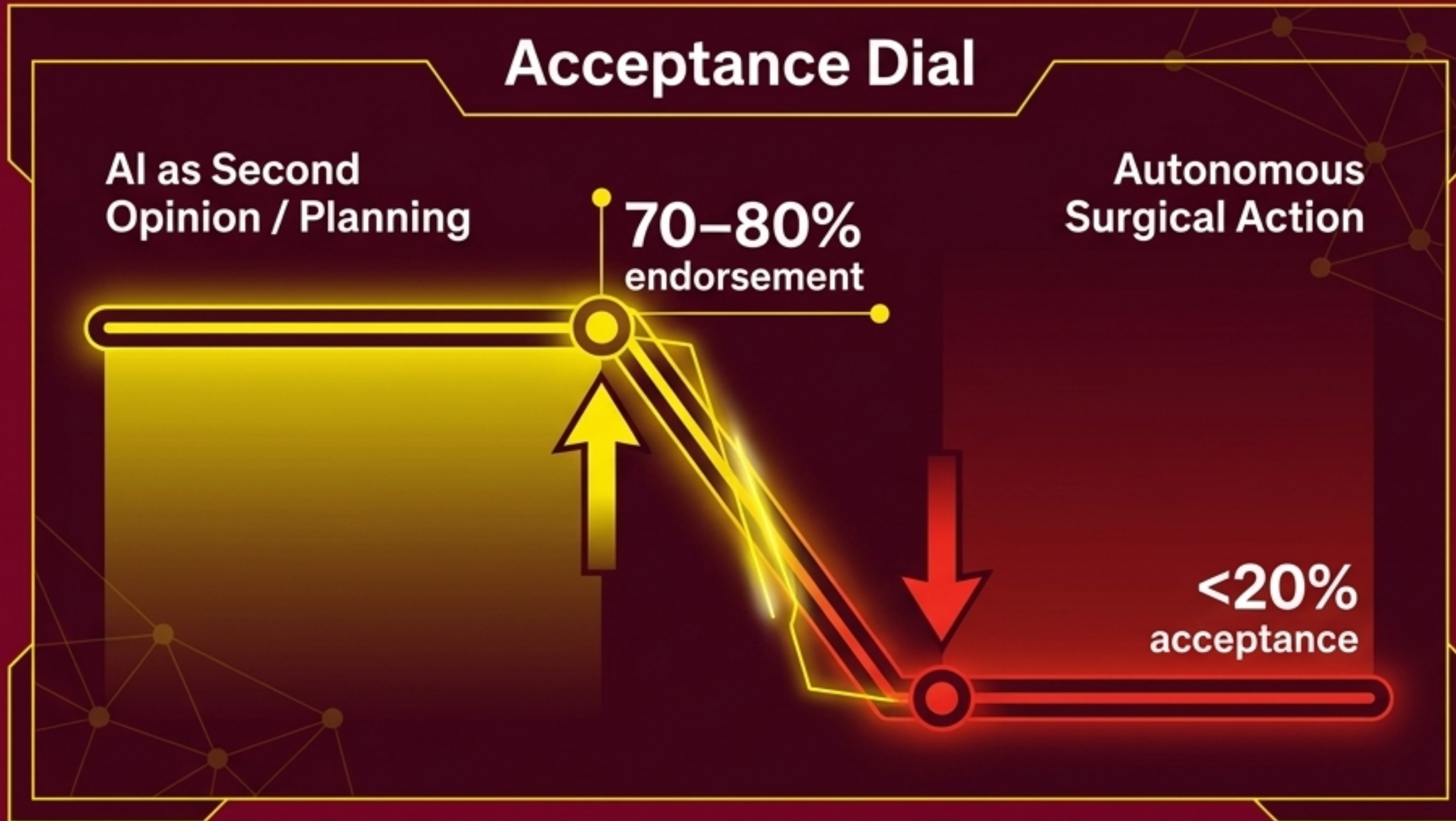


The Study Constellation

Total Sample: ~1,400 participants (550+ neurosurgeons, 350+ patients, plus relatives and staff).



The Patient Perspective: The Transparency Imperative



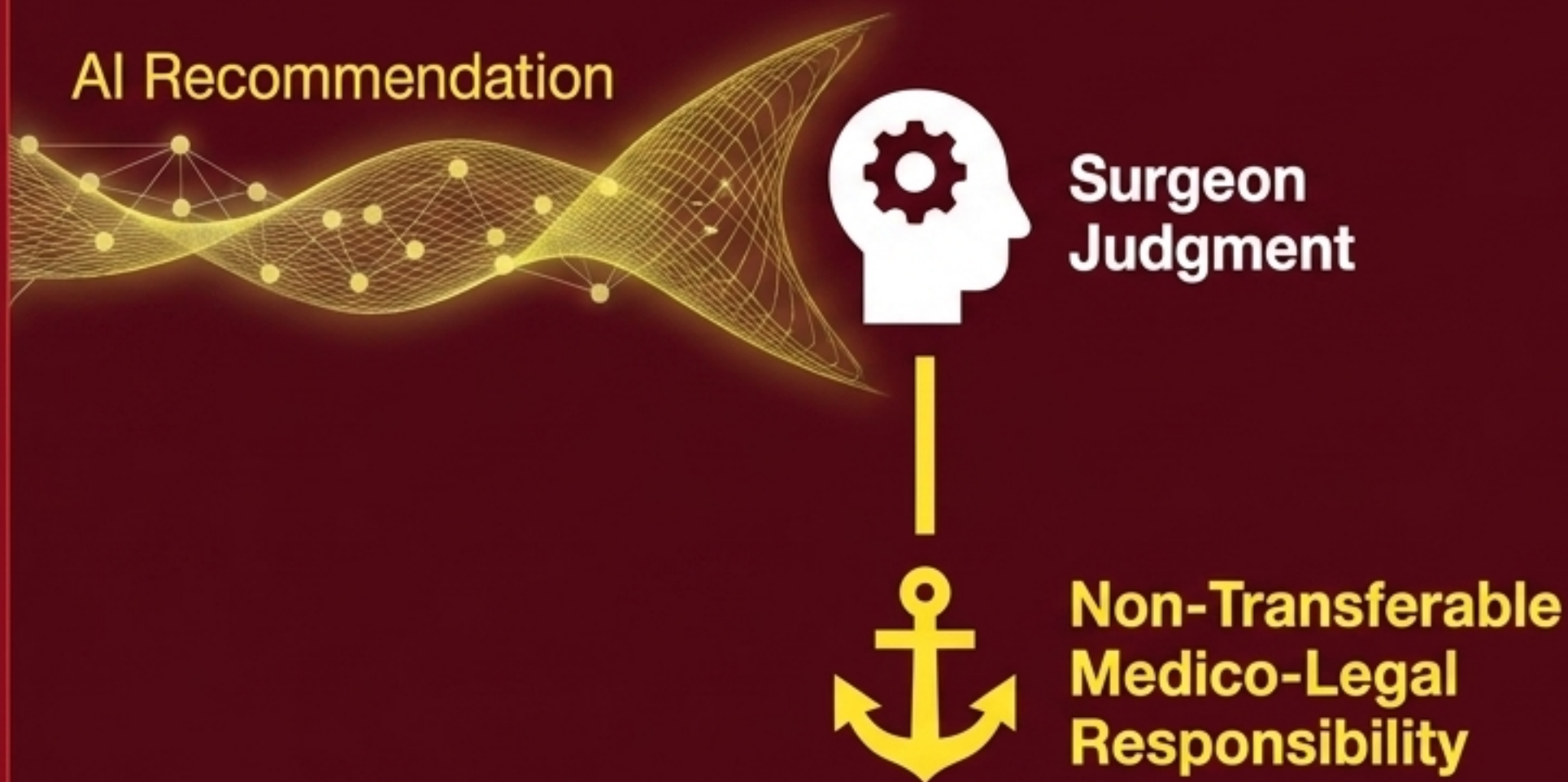
The Demand:
>85% of patients dictate that explicit disclosure of AI involvement is mandatory for informed consent.

“Guidance, not decision-making.”

The Clinician Perspective: The Responsibility Dilemma

Optimism: 60–85% endorse AI for reducing cognitive burden and improving operative planning.

The Automation Bias Hazard



The Threat: The risk of epistemic opacity subtly **distorting human judgment under time pressure.**

The Consensus: Decision-making authority must remain strictly clinician-led.

The Stakeholder Divide

Patients



Primary Focus:

- Transparency & Disclosure

Core Fear:

- Depersonalized care & hidden algorithmic influences

Clinicians



Primary Focus:

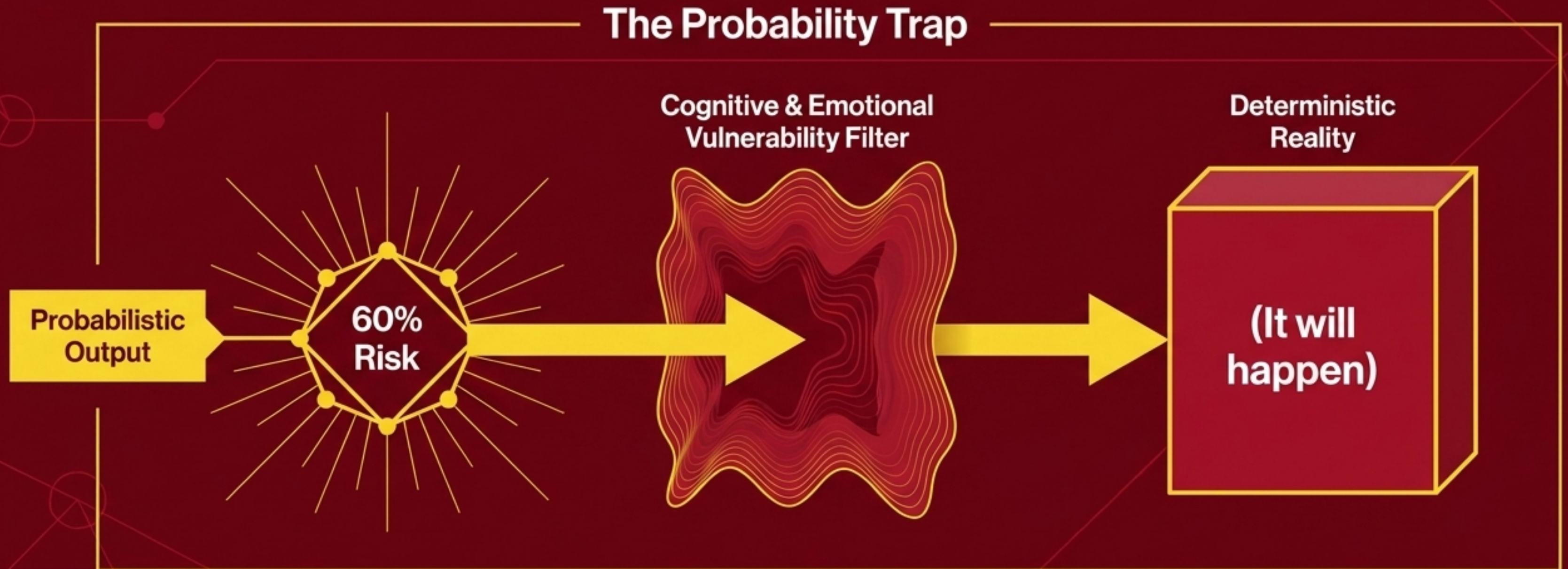
- Interpretability & Oversight

Core Fear:

- Automation bias & diffused medico-legal liability

The Neuro-Oncology Vulnerability

Glioma patients exhibit a specific cognitive vulnerability, mentally translating mathematical probability into categorical certainty. Standard consent models fail here.



Synthesis: Augmentation over Automation

**AI is ethically acceptable only when it augments human judgment.
AI is a tool, not a co-equal partner.**



Adaptive Consent in Precision Medicine

Precision neurosurgery requires a shift from static, one-off preoperative signatures to **iterative, multimodal consent processes tailored to the AI era.**

Sign Here

Sign Here

Waypoint 4

Shared
Decision

Contextualization
of Uncertainty

Waypoint 2

Comprehension
Check

Waypoint 3

Waypoint 1

Explicit Disclosure of AI