Integrating Artificial Intelligence into Pain Management Practice

Transforming Documentation, Diagnosis, and Decision-Making

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DEFINITIONS

What Is Machine Learning (ML)?

- Definition: Machine Learning is a subset of AI that enables computers to learn from data, identify patterns, and make predictions without explicit programming.

- Core Ideas:
  - Data-driven learning: Uses clinical data – labs, imaging, EMG/NCS, outcomes.
  - Pattern recognition: Detects correlations between symptoms and interventions.
  - Model training: Improves accuracy as new data is added.

Natural Language Processing (NLP)

- Definition: NLP allows computers to understand, interpret, and generate human language.

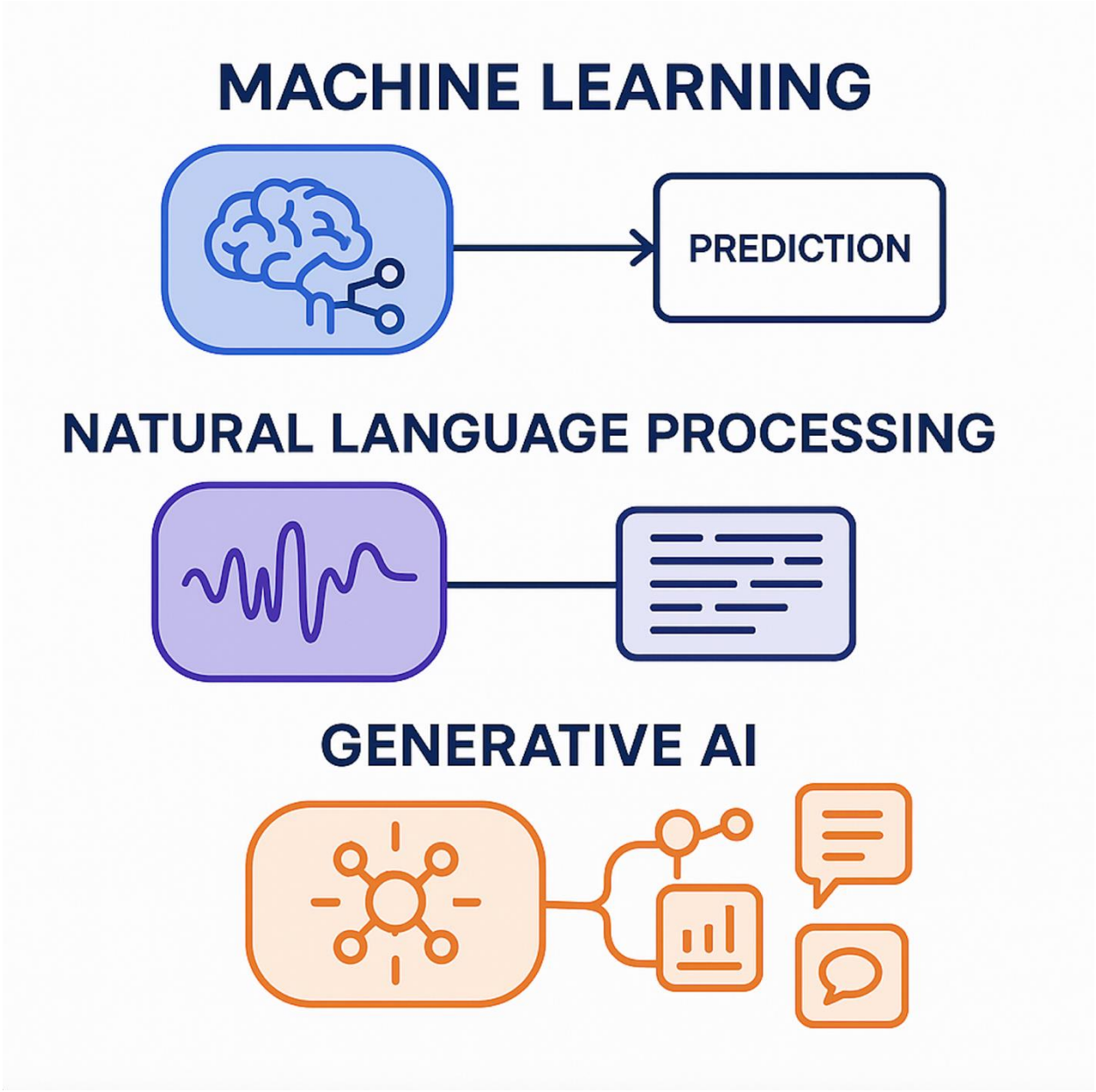
- Core Ideas:
  - Speech-to-text: Converts spoken encounters into transcripts.
  - Text analysis: Extracts diagnoses, medications, and symptoms from notes.
  - Summarization: Converts long transcripts into structured SOAP or CNTP notes.
  - Pain Medicine Examples: AI scribes transcribing visits, auto-summaries of imaging/labs, keyword flagging (e.g., 'radiculopathy', 'RFA', 'opioids').

Generative AI

- Definition: Generative AI refers to systems that create new content – text, images, code, or sound – based on patterns learned from existing data.

- Core Ideas:
  - Content creation: Drafts notes, letters, or summaries.
  - Reasoning & dialogue: Answers clinical or patient questions conversationally.
  - Multi-modal capability: Combines text + images + voice (emerging).
  - Pain Medicine Examples: Drafting patient education materials, referral or insurance letters.

Generative AI



Context

- **Context** refers to the set of information, data, and prior interactions that an AI system can use to understand a task, interpret meaning, and generate relevant responses.
  - **User-provided information** (e.g., a patient's diagnosis, clinical notes, or uploaded lab results).
  - **Persistent memory or project data** (e.g., instructions stored in a ChatGPT Project or a practice's workflow settings).
  - **Environmental or situational data** (e.g., which clinic the user is working in, current patient visit type, or conversation history).

Why AI Matters in Pain Management

- High documentation load – 30–50% of clinician time spent on notes.
- Complex, multimodal data: imaging, EMG/NCS, labs, UDS, outcomes.
- Chronic pain is multifactorial: biological, psychological, functional.
- AI can integrate, summarize, and personalize care better than manual review.

Myths vs. Realities About AI

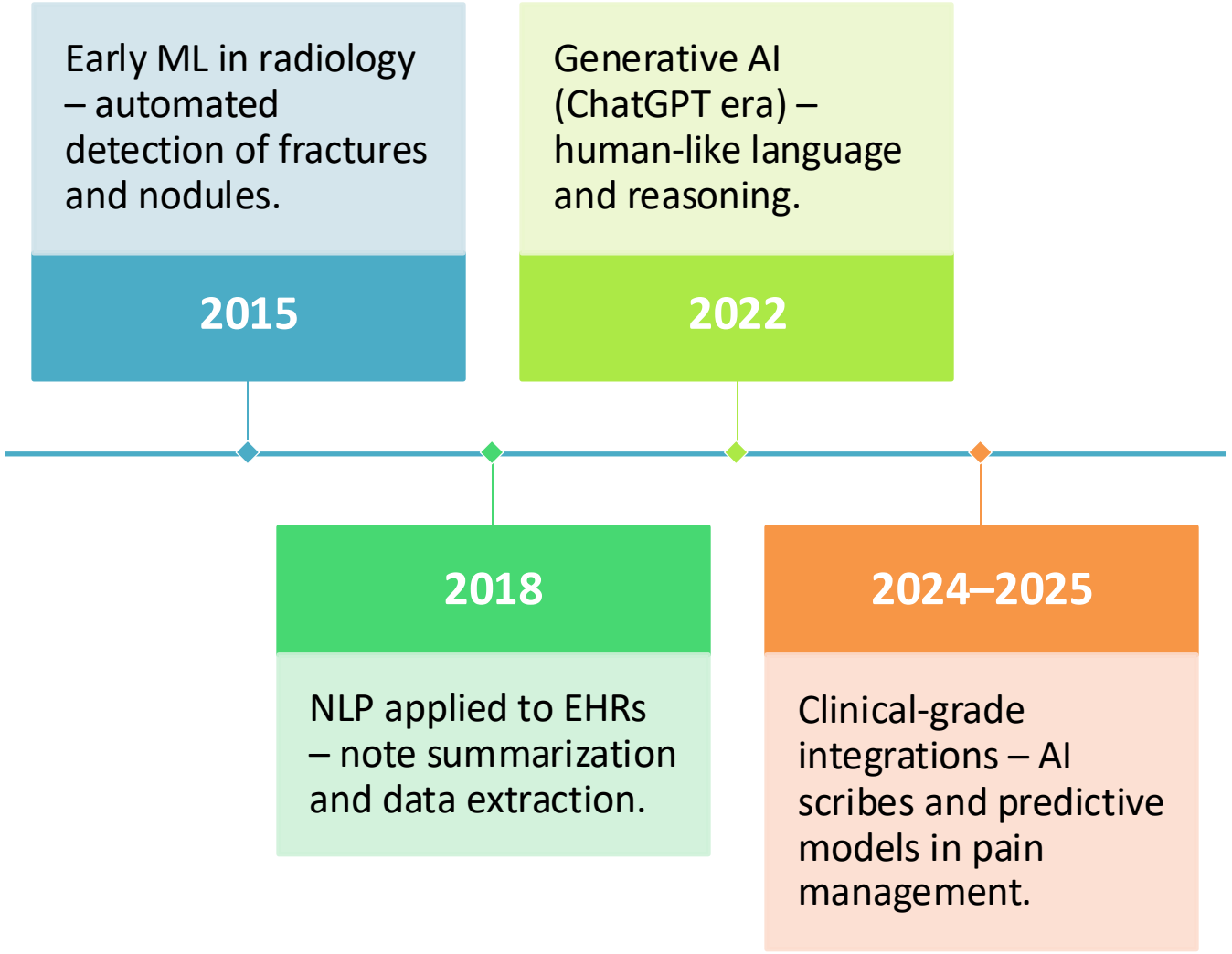
Myth: AI replaces clinicians → Reality: AI supports clinicians by automating repetitive tasks.

Myth: AI is 100% accurate → Reality: Models can hallucinate or misclassify; human oversight is essential.

Myth: AI is only for large hospitals → Reality: Cloud-based tools make AI accessible to private clinics.

Myth: AI decisions are 'black boxes' → Reality: Modern systems provide explainable outputs and audit trails.

The Evolution of AI in Healthcare



Types of AI Applications in Clinical Practice

Clinical Documentation & Workflow Assistance

- AI that listens, transcribes, and structures notes or automates chart tasks.
- Examples: AI scribes (Heidi, DAX, Ambience, Abridge), automated CFUP/CNTP follow-up plans, EHR-integrated orders.

Non–Patient-Specific Generative AI Tools

- General-purpose AI for reasoning, summarizing, or education.
- Examples: ChatGPT, Claude, Gemini – writing patient handouts, policies, or marketing materials.

Communication & Administrative Automation

- AI that manages operations—calls, messages, scheduling, and document routing.
- Examples: AI receptionists for call triage, fax/email parsing into charts, appointment reminders.

PATIENT SPECIFIC

CLINICAL DOCUMENTATION

AI Scribe

Choosing an AI Scribe

HIPAA – COMPLIANT

EHR INTEGRATION

NOTE CUSTOMIZATION

DISCISSION SUPPORT

AFTER VISIT AUTOMATION

Non-HIPAA Compliant

- ChatGPT
- Grok
- Gemini
- Claude

PHI Risks

Stored or logged on external servers outside your control,

Used to retrain the model, or

Accessed by employees or attackers through a data breach or system vulnerability.

Training Data Retention

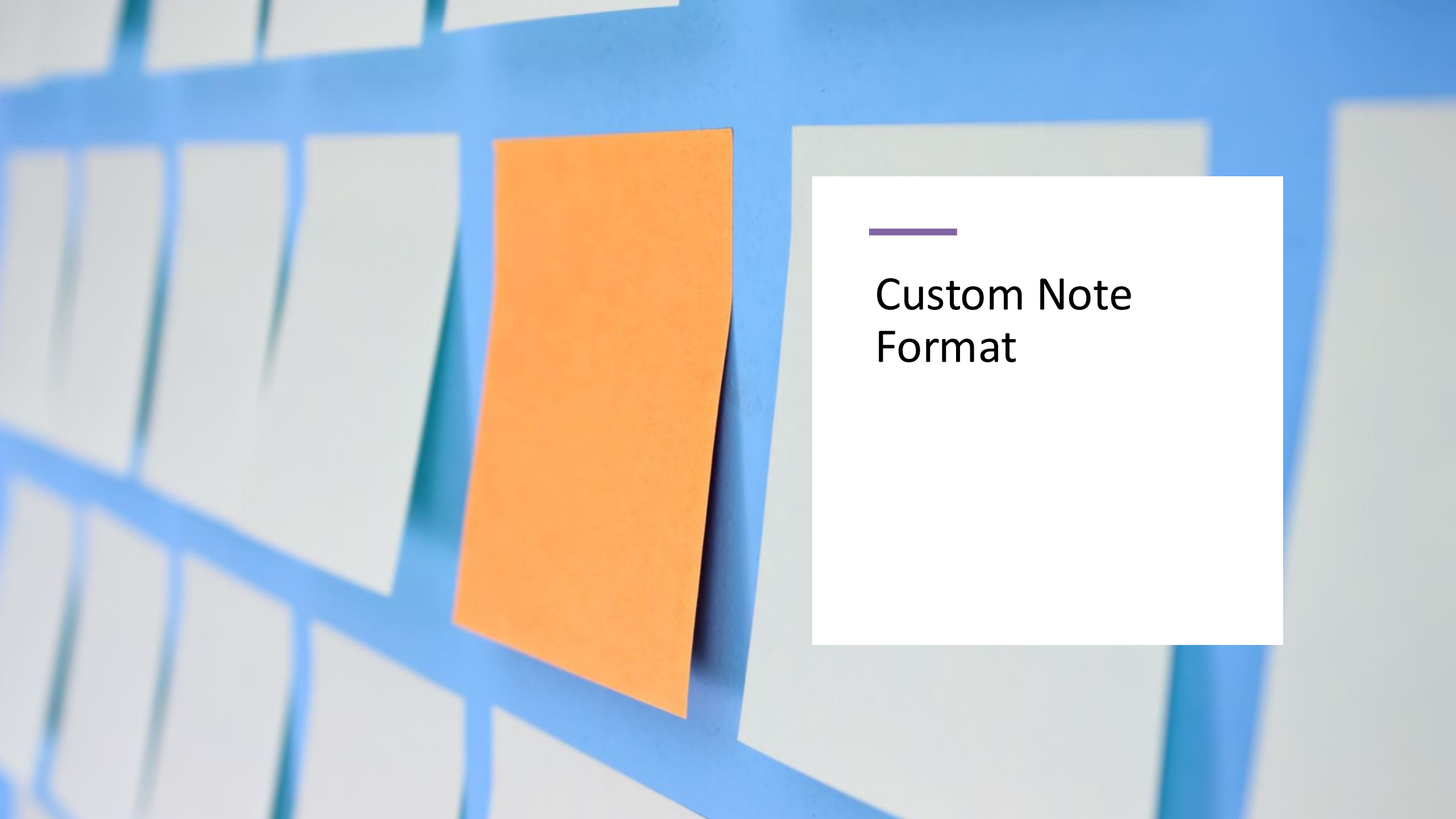
Many public AIs (e.g., free ChatGPT, Gemini, Claude, Grok) store conversation data **for model improvement and training**.

That means your PHI could be incorporated into **future versions** of the model or reviewed by **human trainers**.

Even if the data isn't "published," it's still **accessible** to the vendor — a clear HIPAA violation since no Business Associate Agreement (BAA) exists.

EHR Integration

- Saves Time:
  - Loading session
  - Transferring information in / out scribe
  - Context



Custom Note Format

Decision Support

Discission Support

Is NOT outsourcing clinical discission making

Is curating relevant data (context) to streamline your medical discission making.

Discission Support Examples

Calculate MEDs

Tally Forms (PHQ-9)

Summarize Data (WAPMP)

Prompt when specific criteria are met

Context

After Visit Automation

GENERATIVE AI

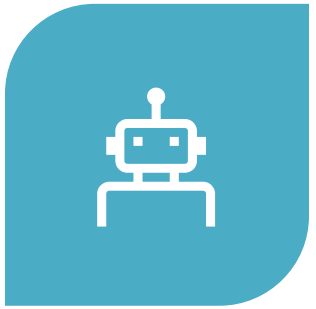
Presented By an AI Dr. Lewis

Generative AI

PATIENT EDUCATION

GRAPHIC ILLUSTRATION

PROJECT TO HOLDS SPECIFIC INFORMATION IN CONTEXT



AGENTS RUN SEMI AUTONOMOUS TASKS

THE END