




# The Do's and Don'ts of Using AI in Your Clinic

**Joaquin Cervantes, MD, MSPH, CPH**  
Panel Physician | Assistant Medical Director  
Clinica Medica Internacional

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Good morning everyone!

# Objectives



Understand **AI fundamentals** in Healthcare.



Recognize current **applications** of AI in **Public Health**.



Identify **risks** associated with AI use in clinical practice.



Apply **best practices** for **safe and compliant AI use**.



**Integrate AI responsibly** into Panel Physician workflows.



**Evaluate AI limitations** using clinical scenarios.



# What is Artificial Intelligence (AI)?



Computer systems that perform tasks requiring human intelligence.



Learn Patterns from large datasets to make predictions or generate outputs.



An AI system is a machine-based system that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments.



# Core Components of AI



## Machine Learning (ML):

The subset of AI that focuses on building systems that learn, or improve performance, based on the data they consume.



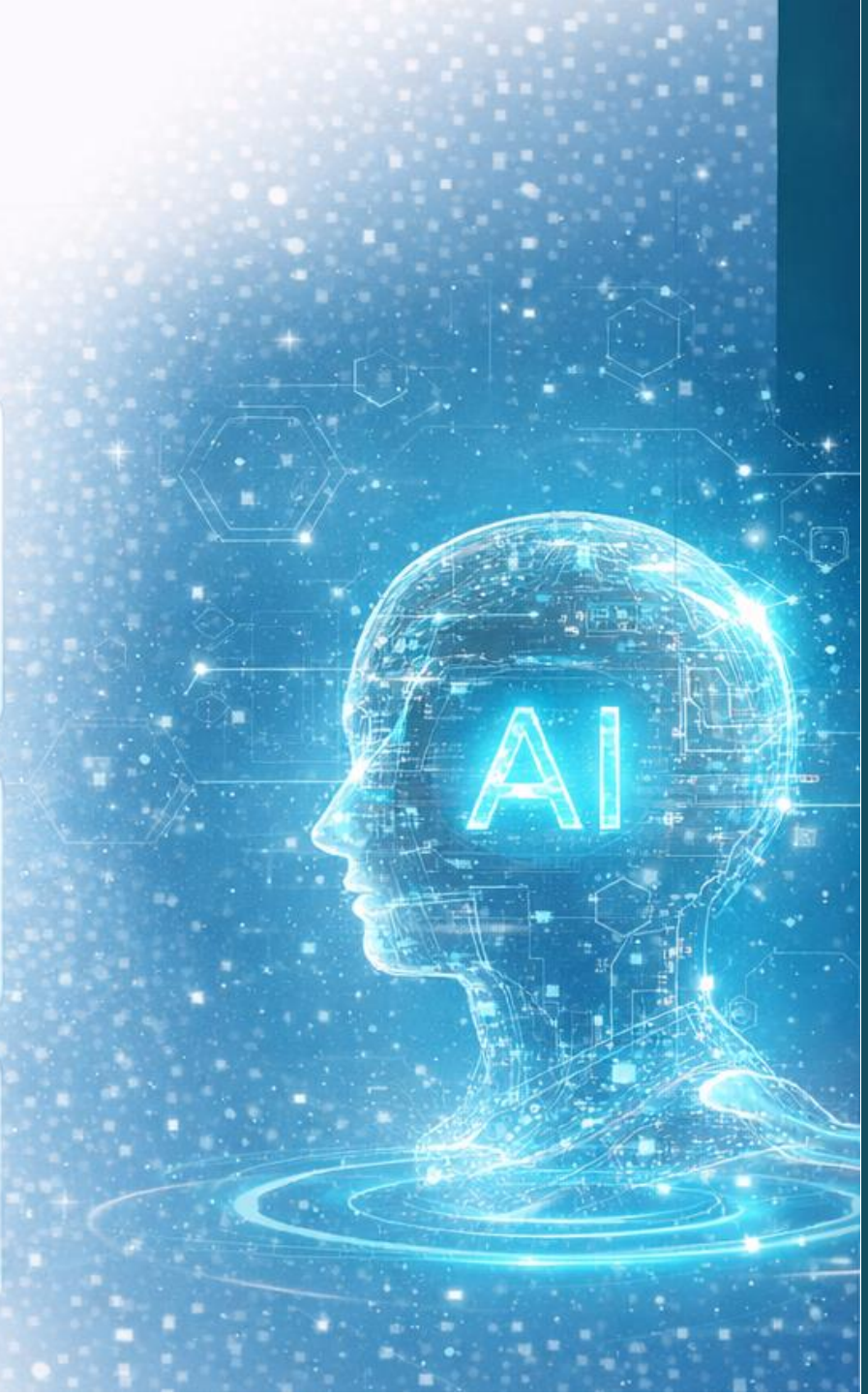
## Neural Networks

A method in AI that teaches computers to process data in a way that is inspired by the human brain.



## Natural Language Processing (NLP):

The ability of a machine to understand, interpret, and generate human language.



# The New Category: Generative AI

ChatGPT, Gemini, etc. combine the three pillars to create **NEW** content rather than just classifying existing data, creating the new category:

## Generative AI

Feature	Where it falls in the pillars
Learning from the internet	Machine Learning
Processing billions of connections	Neural Networks (Transformers)
Talking back to you	Natural Language Processing
Creating a unique essay or poem	Generative AI



# How AI Learns?



AI is trained on historical data.



Improves through processes like backpropagation (learning from errors).



**Performance depends on:**

- Data Quality
- Data Diversity
- Proper Validation



# Key Characteristics:



Pattern recognition, not understanding (this is critical).



Dependent on training data.  
Can be wrong but sound convincing.



Limited ability to handle novel or complex scenarios.



# Types of Data Used in Healthcare AI



## Imaging Data

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- Chest X-rays (TB Detection)
- CT Scans (Nodules)
- Retinal Images



## Structured Data

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- Lab Results (IGRA, CBC)
- Vital Signs (BP, O<sub>2</sub>)
- Risk Scores



## Unstructured Data

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- Clinical Notes
- Radiology Reports
- Patient Interviews

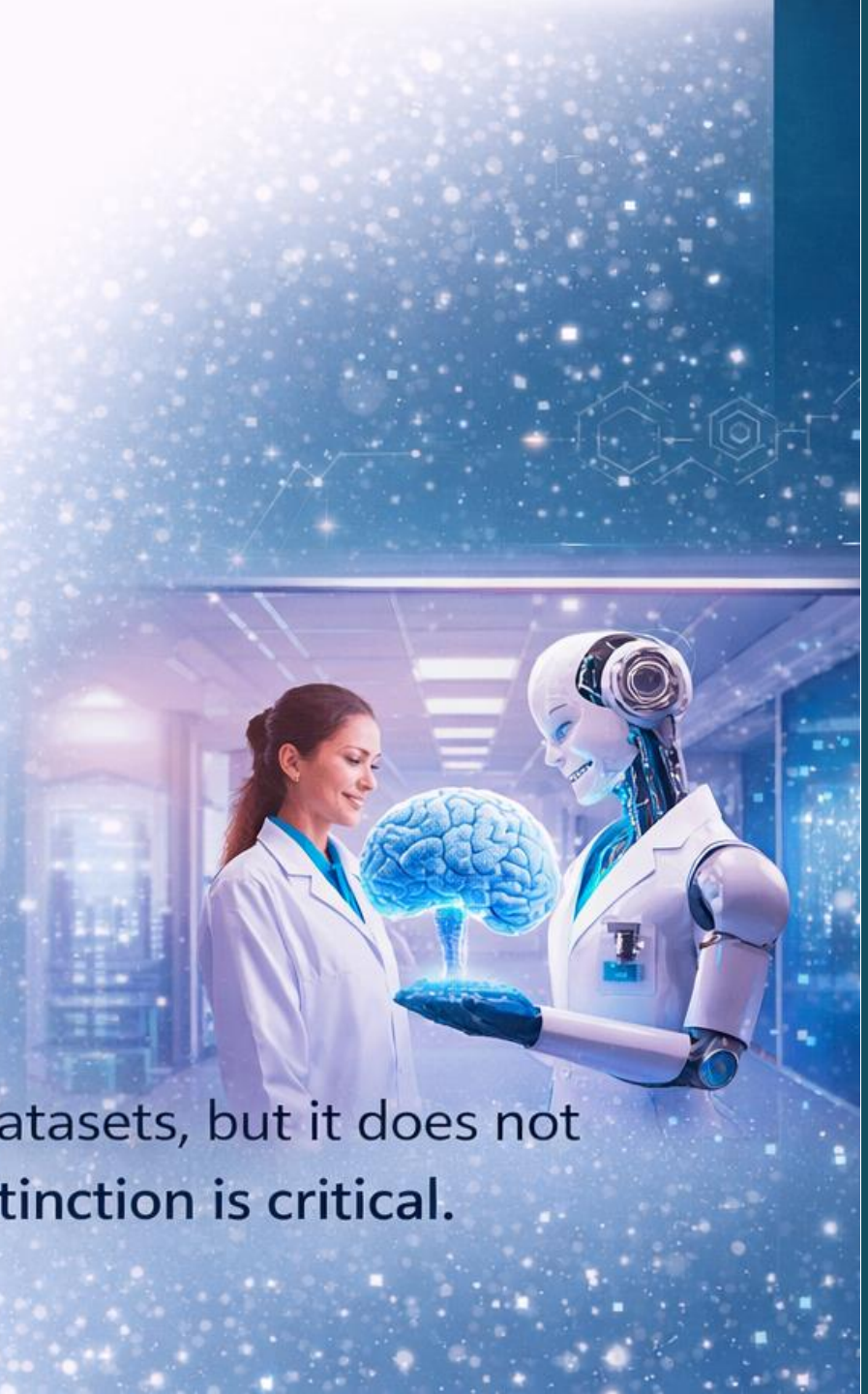
# Key Limitations

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## AI does not replace clinical judgement.

- Cannot interpret context like a physician.
- Cannot resolve conflicting or incomplete data independently.

**AI is very good at recognizing patterns in large datasets, but it does not understand patients the way we do. That distinction is critical.**



# Current Applications of AI in Public Health



Disease surveillance and outbreak detection



Predictive modeling  
(e.g., influenza forecasting)



Environmental health monitoring



Data extraction and analysis (NLP)



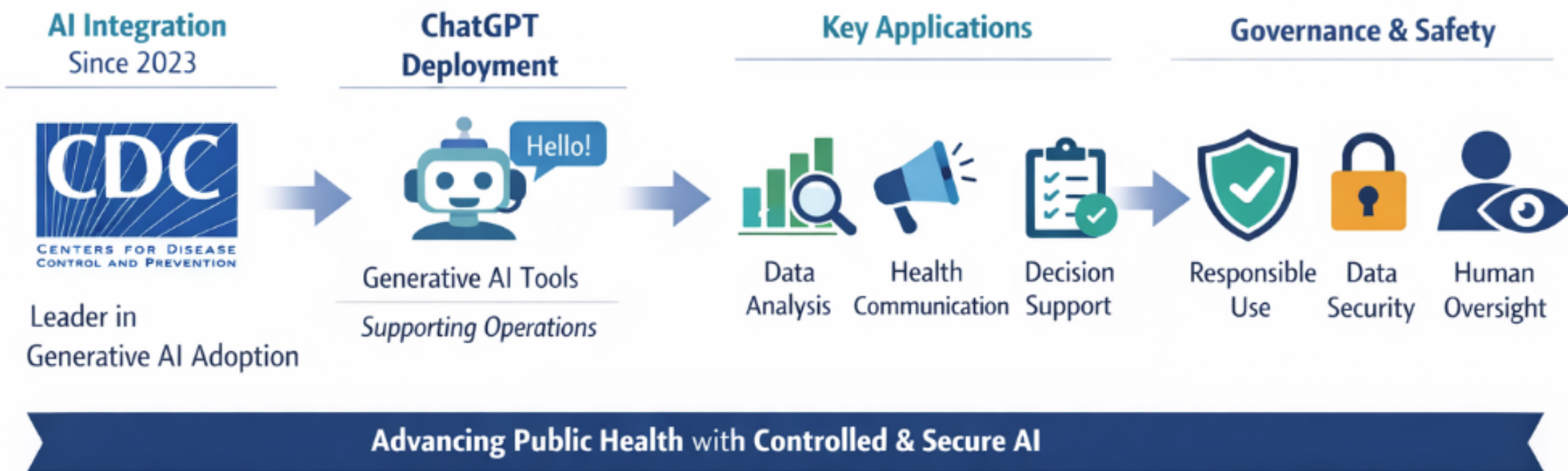
Controlled use of generative AI  
for communication



Environmental health monitoring

Controlled use of generative AI  
for communication

# AI Adoption in U.S. Public Health: The CDC's Journey



# Risks of AI Use in Clinical Practice



## Clinical Risks

- Inaccurate Outputs (“Hallucinations”)
- Automation Bias & Overreliance
- Reduced Clinical Vigilance



## Ethical & Equity Risks

- Bias in Training Data
- Reinforcing Health Disparities



## Privacy & Security Risks

- PHI Breaches & Data Leaks
- Non-Secure AI Tools



## Operational & Legal Risks

- Lack of Transparency
- Liability & Accountability



AI introduces risks—  
but clinical responsibility always remains with the physician.

# Best Practices for Safe and Compliant AI Use

## ✓ Clinical Use

- ✓ AI = **decision support**, not decision maker
- ✓ Always verify outputs
- ✓ Use only in validated scenarios



## ✓ Data Protection

- ✓ Never input PHI into public tools
- ✓ Use secure, compliant platforms
- ✓ De-identify data when possible



## 👤 Compliance

- ✓ Follow institutional and CDC policies
- ✓ Maintain documentation
- ✓ Ensure auditability



## ✓ Physician Responsibility

- ✓ Maintain full clinical oversight
- ✓ Do not delegate decisions to AI
- ✓ You remain accountable



*Safe AI use requires validation, data protection, and physician oversight.*

# Integrating AI into Panel Physician Workflows

## Pre-Evaluation (Administrative Support)

- **AI-assisted appointment scheduling**  
Optimizes patient flow and reduces administrative burden.
- **Pre-screening questionnaires (non-diagnostic)**  
Standardizes data collection prior to clinical evaluation.
- **Document organization and checklist generation**  
Ensures completeness of required forms and records.
- **Email communications with key instructions**  
Automates delivery of preparation guidelines and reminders.

**AI enhances efficiency before the clinical encounter,  
but does not replace physician oversight.**



# Integrating AI into Panel Physician Workflows

## During Clinical Evaluation

- **AI for decision support (guidelines reference, not diagnosis)**  
Helps physicians by providing relevant guidelines, research, or alerts, but does not independently diagnose.
- **Structured documentation assistance**  
Suggests templates, validates entries, and highlights discrepancies for accurate and detailed charting.
- **Language support**  
Facilitates translation, helps create multilingual patient instructions, and ensures document validity for immigration or other purposes.

**AI enhances the clinical encounter, but final decisions always rest with the physician.**



# Integrating AI into Panel Physician Workflows

## Post-Evaluation (Reporting and Compliance)

- **Drafting medical notes, summaries and remarks**  
Automates initial drafts that require review before approval.
- **Quality checks for completeness and clarity**  
Helps ensure reports meet regulatory requirements and standards.
- **Administrative support for panel site management**  
Assists with tracking case status and audit readiness.

AI aids in generating and verifying reports,  
but human oversight ensures compliance.



# AI Limitation Scenario #1: TB Diagnostic Discordance

## ➔ Clinical Scenario

- Adult applicant undergoing immigration medical exam
- CXR suggestive of TB
- Sputum smear: 1+ positive
- Molecular Testing: BD Max → **RIF** resistance detected
- Xpert → No RIF resistance detected
- No prior TB treatment



## ▶ AI Output (Hypothetical)

- “Rifampin-resistant TB likely. Recommend MDR-TB regimen.”

## ⚠ Key Issue

- AI overinterprets conflicting molecular data
- Ignores:
  - **Test limitations**
  - Need for phenotypic DST
  - Clinical correlation



## Takeaway

- AI cannot resolve diagnostic discordance—  
*clinical judgment & confirmatory testing required.*

# AI Limitation Scenario #2:

## Administrative Efficiency vs Clinical Risk

### ➔ Clinical Scenario

- AI tool generates:
  - Medical summary
  - Vaccination assessment
  - Suggests applicant is “fully compliant”



### ⚠️ What Was Missed

- Incorrect interpretation of vaccination intervals
- Missed age-specific CDC requirement
- Incomplete documentation



### 🧠 AI Limitation

- Contextual nuance
- Regulatory specificity
- Up-to-date guideline interpretation



### Takeaway

- AI can improve efficiency—but cannot replace guideline-level verification.

# AI Limitation Scenario #3: Privacy & Misuse Risk

## ➔ Clinical Scenario

- Physician uploads:
  - Chest X-ray image
  - Clinical history
  - into a public AI tool for interpretation



## ⚠ Risk

- Exposure of Protected Health Information (PHI)
- Data stored outside secure systems
- Potential regulatory violation



## 🚫 AI Limitation

- AI tools do not guarantee data protection
- Public tools ≠ compliant tools



## Takeaway

- Convenience must never override data security and compliance

# Conclusions

## ✔ Do's

- ✔ Use AI as a decision-support tool, not a decision-maker.
- ✔ Verify AI outputs with clinical judgement and guidelines.
- ✔ Resolve diagnostic discordance with confirmatory testing and correlation.
- ✔ Confirm vaccination schedules, treatment guidelines, etc. against CDC guidance.
- ✔ Protect patient privacy and use only secure, compliant systems.

## ✘ Don'ts

- ✘ Don't rely on AI to resolve conflicting or complex clinical data.
- ✘ Don't accept AI-generated compliance without manual verification.
- ✘ Don't upload PHI to public or unsecured AI tools.
- ✘ Don't assume AI is up-to-date or regulation-specific.
- ✘ Don't let convenience override safety, accuracy, or compliance.

# Thank you!

Contact:

Joaquin Cervantes, MD, MSPH, CPH

+1 915 799 7311

[jcervantes@cmi-medical.com](mailto:jcervantes@cmi-medical.com)

