

AI+ Doctor Practitioner (1 Day)

Program Detailed Curriculum

AI+
Doctor
Practitioner™

Executive Summary

The AI+ Doctor Practitioner Certificate is a hands-on, practitioner-oriented training program crafted for physicians and healthcare professionals. In eight hours across eight modules, the course demystifies artificial intelligence in medicine. Learners engage with key concepts in machine learning, clinical decision support, imaging AI, NLP (ChatGPT/LLMs), and ethical considerations. Through simulated cases and guided activities, clinicians gain confidence to critically evaluate AI tools, understand their integration into practice, and lead responsible innovation within their care environments.

Course Prerequisites

- Basic digital literacy (e.g., using EHRs, accessing online platforms)
- Clinical background (MBBS, MD, DO, RN, NP, PA, etc.)
- No programming or data science background required

Module 1

What is AI in Medicine?

1.1 Understanding AI Fundamentals

- **Definitions – AI vs. ML vs. Deep Learning:** Understand AI as intelligent systems, ML as learning from data, and Deep Learning as advanced neural networks for complex tasks.
- **Types of Machine Learning – Supervised, Unsupervised, Reinforcement:** Learn supervised learning (labeled data), unsupervised learning (pattern discovery), and reinforcement learning (decision-making through feedback).
- **Algorithms in Medicine – How AI "Learns" from Data:** Understand how AI learns from medical data to identify patterns, predict outcomes, and support clinical decisions.

1.2 Clinical Relevance of AI

- **AI in Practice – Use Cases Across Specialties:** Understand how AI supports diagnostics, radiology, pathology, cardiology, and personalized treatment planning.
- **Myths and Facts – Will AI Replace Doctors?:** Learn that AI enhances doctors, not replaces them—supporting faster, more accurate clinical decisions.
- **Real-World Tools – DeepMind, Epic Systems, SkinVision:** Explore real tools used for medical imaging, EHR management, and early skin cancer detection.

Module 2

AI in Diagnostics & Imaging

2.1 Deep Learning in Clinical Imaging

- **How CNNs Work – X-ray, CT, and Histology Analysis:** Understand how Convolutional Neural Networks (CNNs) analyze medical images by detecting patterns, edges, and anomalies in X-rays, CT scans, and histology slides.
 - **Radiology AI – Pneumonia, Stroke, Cancer Use Cases:** Learn how AI supports radiology by identifying conditions like pneumonia, detecting strokes early, and assisting in cancer diagnosis with high accuracy.
 - **Model Training – From Labeling to Deployment:** Understand how AI models are trained using labeled medical data, validated for accuracy, and deployed into clinical workflows for real-world use.
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2.2 Interpreting and Using AI Outputs

- **Heatmaps, Saliency Maps, Confidence Scores:** Understand how heatmaps and saliency maps highlight key image areas, while confidence scores indicate prediction reliability.
 - **FDA-Approved Tools – What to Trust and How:** Learn how to evaluate approved AI tools based on validation, accuracy, and clinical reliability before use.
 - **Human-AI Collaboration – Diagnostic Decision Support:** Understand how AI supports clinicians by enhancing diagnostic decisions while keeping human judgment central.
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Module 3

Predictive Analytics & Clinical Decision Support

3.1 Building Predictive Risk Models

- **Structured Clinical Data – Labs, Vitals, Notes:** Understand how structured data like lab results, vital signs, and clinical notes are used to build predictive models.
 - **ML Methods – Logistic Regression, Tree Models:** Learn how models like logistic regression and decision trees analyze data to predict clinical risks and outcomes.
 - **Use Cases – Sepsis Alerts, Readmission Prediction:** Understand how predictive models enable early sepsis detection and identify patients at risk of readmission.
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3.2 Implementing Clinical AI Alerts

- **Early Warning Systems – NEWS, MEWS:** Understand how scoring systems like NEWS and MEWS detect early patient deterioration using vital signs.
 - **Real-Time Case Review – ICU Alerts in Practice:** Learn how AI-driven alerts support real-time monitoring and rapid intervention in ICU settings.
 - **Evaluating Risk Models – Sensitivity vs. Specificity:** Understand how sensitivity identifies true positives, while specificity reduces false alarms in clinical alerts.
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Module 4

NLP and Generative AI in Clinical Use

4.1 Foundations of NLP and LLMs

- **What is NLP? – From Text Mining to Classification:** Understand how NLP processes clinical text for tasks like extraction, classification, and summarization.
 - **Prompting AI – Basic to Advanced Prompts:** Learn how to write effective prompts to guide AI for accurate clinical outputs and insights.
 - **Introduction to LLMs – GPT, Med-PaLM, ClinicalBERT:** Understand how LLMs generate, interpret, and analyze medical text for decision support.
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4.2 Using ChatGPT in Medicine

- **Discharge Summaries, Referral Letters, Patient Instructions:** Learn how ChatGPT assists in drafting discharge summaries, referral notes, and clear patient instructions.
 - **Clinical Documentation Integration – Ambient Intelligence:** Understand how AI enables ambient documentation by capturing and structuring clinical conversations in real time.
 - **Limitations – Hallucination, Accuracy, Overreliance:** Learn the risks of AI hallucinations, variable accuracy, and the need to avoid overreliance in clinical decisions.
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Module 5

Predictive Analytics & Clinical Decision Support

5.1 Ethical and Equitable AI Use

- **Algorithmic Bias – Racial, Socioeconomic, Gender:** Understand how bias in data can lead to unequal outcomes across race, socioeconomic status, and gender.
 - **Fairness in Practice – Validating Across Populations:** Learn how to ensure fairness by testing AI models across diverse patient groups.
 - **Explainability Tools – SHAP, LIME for Doctors:** Understand how explainability tools help doctors interpret AI decisions and build trust.
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5.2 Regulation and Responsibility

- **HIPAA, GDPR, and FDA/EMA Guidelines:** Understand key regulations like HIPAA, GDPR, and guidelines from FDA / EMA for safe AI use.
 - **Drafting Ethical AI Usage Policies:** Learn how to create policies ensuring privacy, transparency, accountability, and responsible AI deployment.
 - **Legal Scenarios – Who's Liable When AI is Wrong?:** Understand shared liability across clinicians, developers, and institutions when AI-driven decisions fail.
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Module 6

Evaluating AI Tools in Practice

6.1 Metrics That Matter to Clinicians

- **Accuracy, Recall, Precision – Explained Simply:** Understand accuracy as overall correctness, recall as detecting true cases, and precision as avoiding false alarms.
 - **Case Example – Choosing the Best Model for Stroke Risk:** Learn how to select models based on higher recall for critical conditions like stroke risk detection.
 - **ROC Curves and Confusion Matrix Interpretation:** Understand how ROC curves assess model performance and confusion matrices break down prediction outcomes.
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6.2 Assessing AI Products and Vendors

- **Questions to Ask – Validation, Dataset Diversity:** Understand how to evaluate AI tools by checking clinical validation, dataset quality, and population diversity.
 - **Create a Clinical AI Tool Evaluation Checklist:** Learn to build a checklist covering accuracy, explainability, integration, compliance, and usability.
 - **Red Flags – Misleading Claims, Lack of Transparency:** Understand warning signs like exaggerated performance, unclear data sources, and lack of transparency.
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Module 7

Implementing AI in Clinical Settings

7.1 Integrating AI into Workflows

- **Identifying Use Cases in Your Department:** Understand how to identify tasks where AI can improve efficiency, accuracy, and patient care.
 - **Piloting an AI Tool – Timeline and Milestones:** Learn how to implement AI through pilot phases, setting clear timelines, testing, and evaluation milestones.
 - **Mapping AI to Clinical Tasks – Not Replacing Judgment:** Understand how AI supports clinical tasks while keeping human judgment central to decision-making.
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7.2 Team Collaboration and Monitoring

- **Forming a Clinical-AI Integration Team:** Understand how to build cross-functional teams with clinicians, data scientists, and IT experts.
 - **Root Cause Analysis for AI-Related Errors:** Learn how to identify, analyze, and address errors in AI-driven clinical decisions.
 - **Monitoring Outcomes, Feedback Loops:** Understand how continuous monitoring and feedback improve AI performance and patient outcomes.
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The Future of AI & Your Role

8.1 Emerging Trends in Medical AI

- **Multimodal AI – Combining Images, Text, and Wearables:** Understand how AI integrates imaging, clinical text, and wearable data for holistic patient insights.
 - **Future Regulatory Landscape – Preparing Clinicians:** Learn how evolving regulations will shape safe, compliant AI adoption in healthcare.
 - **AI in Robotics, Genomics, and Virtual Care:** Understand how AI advances robotic surgery, genomic analysis, and virtual healthcare delivery.
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8.2 Becoming an AI Leader in Medicine

- **Career Pathways – Clinical AI Champion, Consultant:** Understand roles like AI champions and consultants driving adoption and innovation in healthcare.
 - **Capstone – Drafting Your Department’s AI Readiness Plan:** Learn how to create a practical roadmap for AI integration, including goals, tools, and timelines.
 - **Staying Current – Journals, Fellowships, Online Training:** Understand how continuous learning through research, fellowships, and courses keeps you updated in medical AI.
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Additional Module

AI+ Doctor Practitioner Agents

- **What Are AI Agents:** Learn about AI agents in healthcare as intelligent systems that assist doctors by analyzing patient data, automating routine tasks, and supporting clinical decisions. These agents leverage machine learning, natural language processing, and predictive analytics to enhance diagnosis, treatment planning, and patient care outcomes.
 - **AI Agents in Healthcare:** Understand how AI agents are transforming healthcare by streamlining clinical workflows, enabling faster and more accurate diagnoses, and improving patient engagement. Explore how they assist in areas like medical imaging, electronic health records (EHR) management, virtual health assistants, and predictive patient monitoring.
 - **Core Characteristics of AI Agents:** Discover the essential features of AI agents, including autonomy, adaptability, real-time decision-making, continuous learning, and data-driven insights. These characteristics enable AI agents to operate effectively in dynamic healthcare environments while supporting clinicians.
 - **Importance of AI Agents (General + Healthcare):** Learn why AI agents are becoming essential across industries and particularly in healthcare. They reduce human error, enhance efficiency, lower operational costs, and improve decision-making, ultimately leading to better patient outcomes and optimized healthcare delivery.
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- **Significance of AI Agents in Healthcare:** Explore the critical role AI agents play in modern healthcare systems, from early disease detection and personalized treatment plans to remote patient monitoring and hospital resource optimization. They are key to advancing precision medicine and improving accessibility to quality care.
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- **Types of AI Agents:** Explore the five types of AI agents: simple reflex, model-based, goal-based, utility-based, and learning agents. Understand how each type functions within healthcare—from basic rule-based alerts to advanced systems that learn from patient data and improve over time.
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- **Applications and Trends in Healthcare:** Discover real-world applications such as AI-powered diagnostics, robotic surgery assistance, virtual nursing assistants, and predictive analytics for disease outbreaks. Learn about emerging trends like AI-driven personalized medicine, telehealth integration, and continuous patient monitoring.
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- **Case Study – AI Agents for Healthcare Data Unification:** Examine how AI agents integrate and unify fragmented healthcare data from multiple sources such as EHRs, lab systems, and wearable devices. Understand how this unified view improves clinical decision-making, enhances care coordination, and delivers a holistic patient experience.
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