AI Then & Now: A Clinical and Diagnostic Perspective

Zachary McCarty, OD – SouthEast Eye Specialists, PLLC

1 hour

Course Description

AI seeks to revolutionize the clinical and diagnostic device market for optometrists. Building on an introductory level knowledge of AI, this lecture reviews the foundational understanding of AI, which is then used to evaluate new AI diagnostic devices in clinic. AI will further be discussed through the perspective of a primary care optometrist seeking to understand the place that these tools may be/already are being utilized in the clinic and in ophthalmic diagnostics.

Course Objectives

- Understand the history and common terms associated with artificial intelligence.
- Learn the current state of artificial intelligence and how it works.
- Learn the ways that artificial intelligence can safely be incorporated into contemporary optometric practice.

I. What is AI?

- Brief History of AI
  - Turing (1950)
  - Dartmouth Workshop (1956)
  - early topics
- Previous Iteration:
  - GOFAI
    - symbolic representation
    - strengths (explainability)
    - limitations (scalability, complexity, lack of learning)

II. Current Iteration of AI

- Quick Primer
  - AI → ML → Deep Learning → Neural Networks
- Types
  - Narrow AI
  - General AI
  - Superintelligence
- Core Fields
  - NLP, Computer Vision
  - Reinforcement
  - Supervised/Unsupervised

    - Generative AI
- Key Themes
    - Bias
    - Explainability
    - Ethics
    - Automation
    - hallucination
- Why AI Exploded
    - computing power
    - big data
    - advanced algorithms
    - lower costs
    - quantum computing
    - prompt engineering
- How AI Works (LLMs)
    - prediction-based
    - binary encoding
    - backward-looking
    - limitations (bias, creativity, context)

III. AI in Everyday Life

- Examples
    - calendar suggestions
    - chatbots
    - virtual assistants
    - image/text generation

IV. AI in Eye Care

- Current Uses
    - diagnostics (corneal topography, OCT, visual fields)
    - clinical documentation
    - personalized medicine
    - admin workflow
    - patient engagement
    - remote monitoring
- FDA-Cleared Devices
    - IRIS
    - Luminetics Core (IDx-DR)
    - RightEye
    - EyeBOX
    - Clarus
    - EyeArt
    - Eye-SYNC
    - AEye-DS

    - Notal Vision Home OCT
- Future/Developmental Devices
    - Reti-Spec
    - Zilia
    - Perivision
    - OpenEvidence

V. Looking Ahead

- Integration into diagnostics and care
- Ethical and regulatory considerations
- Ongoing research and validation

VI. Q&A and discussion