

# The Role of Artificial Intelligence in Oncology Training

Exploring Research Aspects and AI Integration

Dr Seyed Alireza Javadinia

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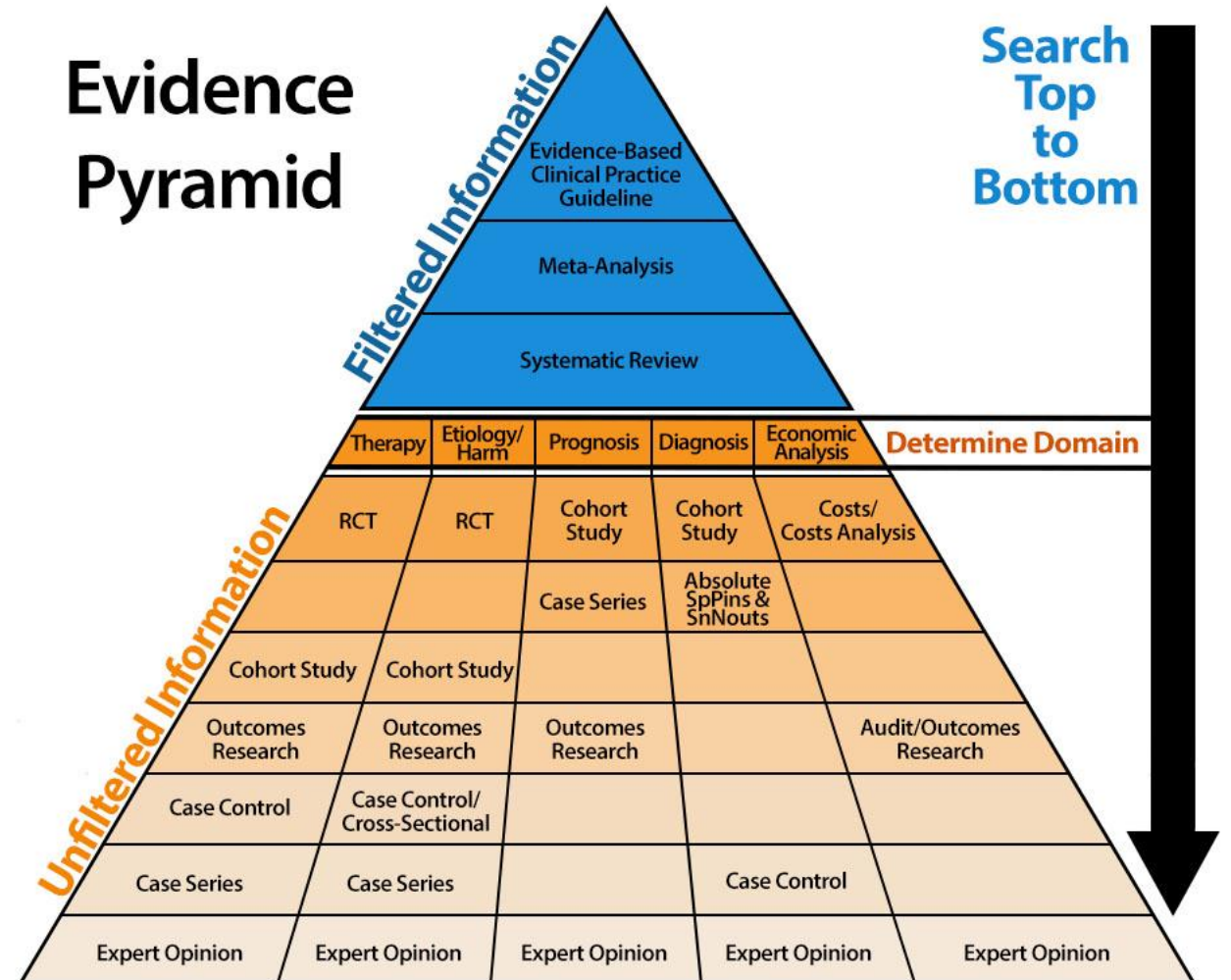
# Introduction to Research in Oncology

- **Why Conduct Research?**
  - Improve patient outcomes
  - Advance medical knowledge
  - Develop new therapies
  - Address healthcare disparities

# Types of Research Studies

- **Clinical Trials**
  - Phase I (safety), II (efficacy), III,
- **Observational Studies**
  - Cohort studies
  - Case-control studies
- **Laboratory Research**
  - In vitro and in vivo studies
- **Translational Research**
  - From bench to bedside

## Evidence Pyramid



# Designing Research Studies

- **Key Elements of Study Design:**

- Defining the research question
  - **PICO** (patient/population, intervention, comparison and outcomes)
  - **SPICE** (Setting, Perspective, Intervention, Comparison, Evaluation)
  - **POE** (Population, Exposure, Outcome)
- Selecting appropriate methodology
- Establishing inclusion/exclusion criteria
- Determining sample size
- Ethical considerations

# Role of AI in Oncology Research

- **Literature Review and Data Mining**

- **Automated Search:** AI can quickly sift through vast amounts of literature to identify relevant studies, saving researchers time.
- **Trend Analysis:** AI can analyze publication trends to identify gaps in research or emerging areas of interest.

- **Natural Language Processing (NLP)**

- **Text Analysis:** AI can analyze qualitative data, extracting themes and sentiments from interviews or open-ended survey responses.
- **Summarization:** NLP models can summarize large volumes of text, making it easier for researchers to digest information.

- **Decision Support**

- **Recommendation Systems:** AI can provide recommendations for interventions based on similar studies and outcomes.
- **Simulation Models:** AI can simulate various scenarios to help researchers understand potential outcomes of different interventions.

# Role of AI in Oncology Research

- **Enhancing Data Analysis**

- Machine learning algorithms for pattern recognition
- Predictive analytics for patient outcomes

- **Improving Clinical Trials**

- Patient recruitment and retention
- Real-time data monitoring

- **Facilitating Personalized Medicine**

- Genomic data analysis
- Tailored treatment plans

# Conclusion

- **Summary:**

- Importance of research in oncology
- Diverse study types and designs
- Transformative role of AI in enhancing research effectiveness