2024
SUPPLEMENTAL HEALTH, DI & LTC CONFERENCE

The Winning Trifecta

Revolutionizing Healthcare: The Power of AI in Screening Tools

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Morbidity

Defined as the occurrence of disease or illness in a population

- The state of being unhealthy or symptomatic for a disease or condition

  - Typically estimated by prevalence or incidence

Disease specific morbidity vs. overall morbidity

Screening Tools in Healthcare Today

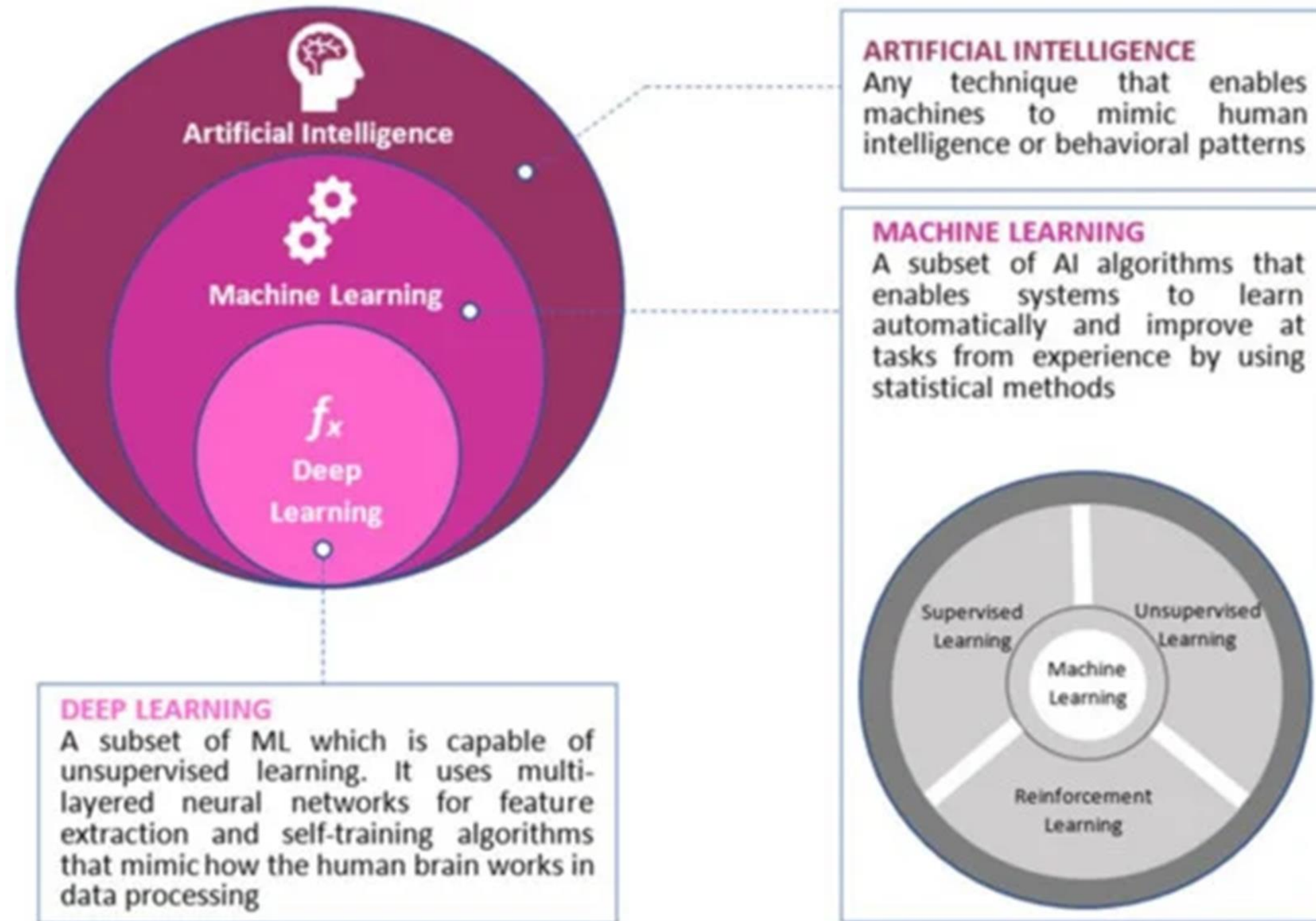Early detection has improved health outcomes

Traditional screening tools: Physical exams, imaging, and lab tests

- Positives vs. Limitations

Artificial Intelligence (AI) is the simulation of human intelligence in machines that are programmed to think and learn like humans.

ARTIFICIAL INTELLIGENCE
Any technique that enables machines to mimic human intelligence or behavioral patterns

MACHINE LEARNING
A subset of AI algorithms that enables systems to learn automatically and improve at tasks from experience by using statistical methods

DEEP LEARNING
A subset of ML which is capable of unsupervised learning. It uses multi-layered neural networks for feature extraction and self-training algorithms that mimic how the human brain works in data processing

Introduction To AI in Healthcare

- **Healthcare Applications:** Screening, surveillance, enhanced diagnostics, treatment, patient care, streamlining processes and risk assessment.

  - **Overarching goal:** improve efficiency, accuracy, and outcomes by leveraging advanced technologies and analysis.

AI-Based Screening and Diagnostic Tools

- **How do AI screening and diagnostic tools work?**

  - Algorithms and machine learning modules analyze large data sets and identify patterns

    - Images, lab results, and records can identify markers of disease

- Improved accuracy and timely decision(s)

- Predictive modeling for disease progression and treatment

# Study of AI Vs. Human Doctors for Triage and Diagnoses

Identical hypothetical cases given

Differential diagnoses and triages evaluated by independent judges

AI Powered Triage and Diagnostic System to identified conditions comparable to human doctors in terms of precision and recall

Triage advice was on average safer than the human doctors when compared with independent expert judges

AI Applications for Cancer Screening
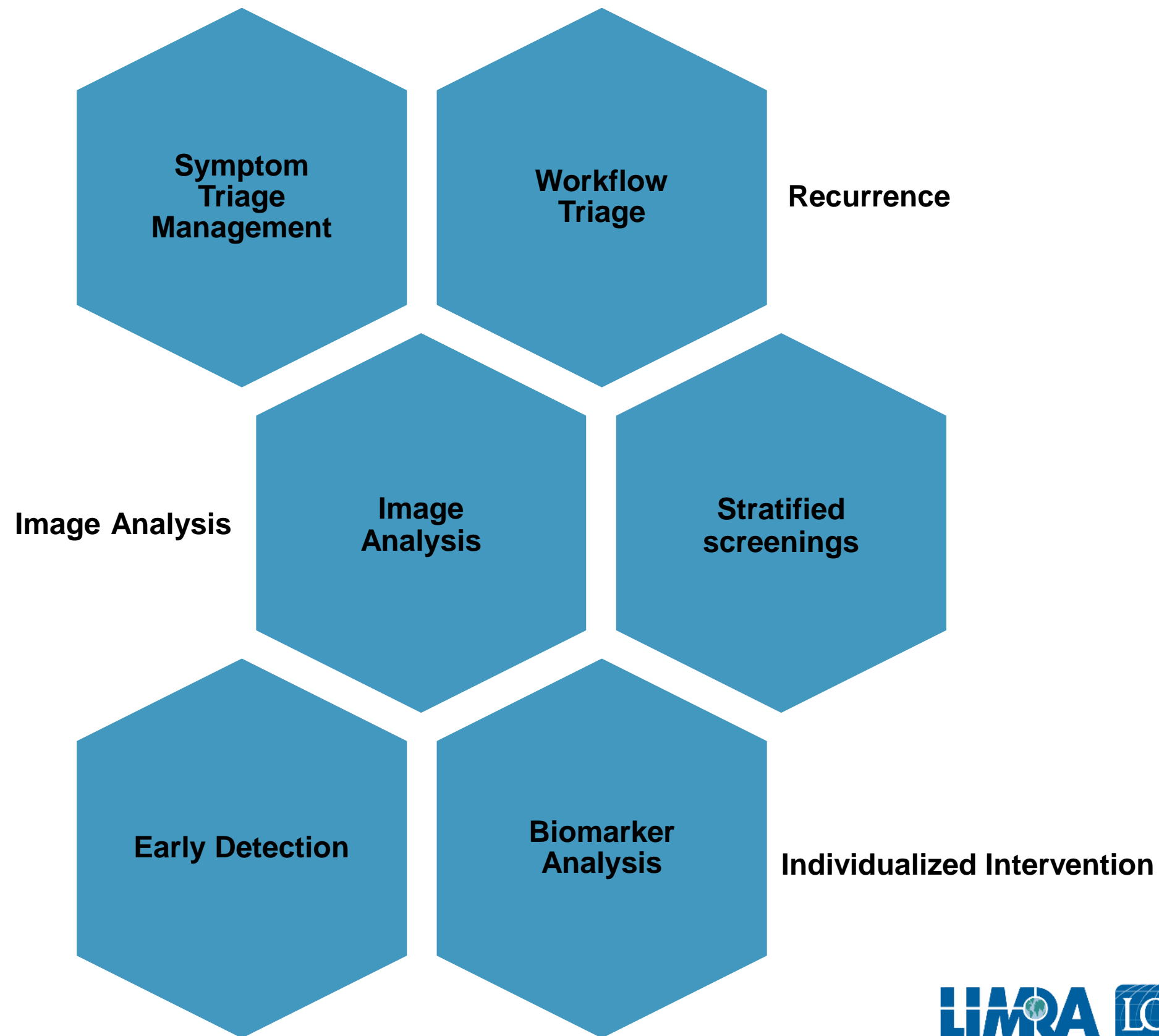
Detecting Novel Biomarkers for non-eye related conditions: Anemia, HbA1c, eGFR, cardiovascular risk

- Viewed with deep learning non-invasive image screening tool.

Automated Retinal Disease Assessment (ARDA): Detects diabetic retinopathy which is one of the leading causes of blindness across the world

- Customized treatment and eye screening frequencies

- Treatment is often in late stages due to late diagnoses after development of symptoms

  - Early intervention and discovery could delay or stop disease progression.

- Low dose CT screening has already demonstrated a reduction in lung cancer progression and early intervention

- Combining imaging and biomarkers with AI can assess and decrease morbidity risk

  - Lung nodule(s) volume, calcium score, lung density etc.

- There currently is no CT that does all biomarkers
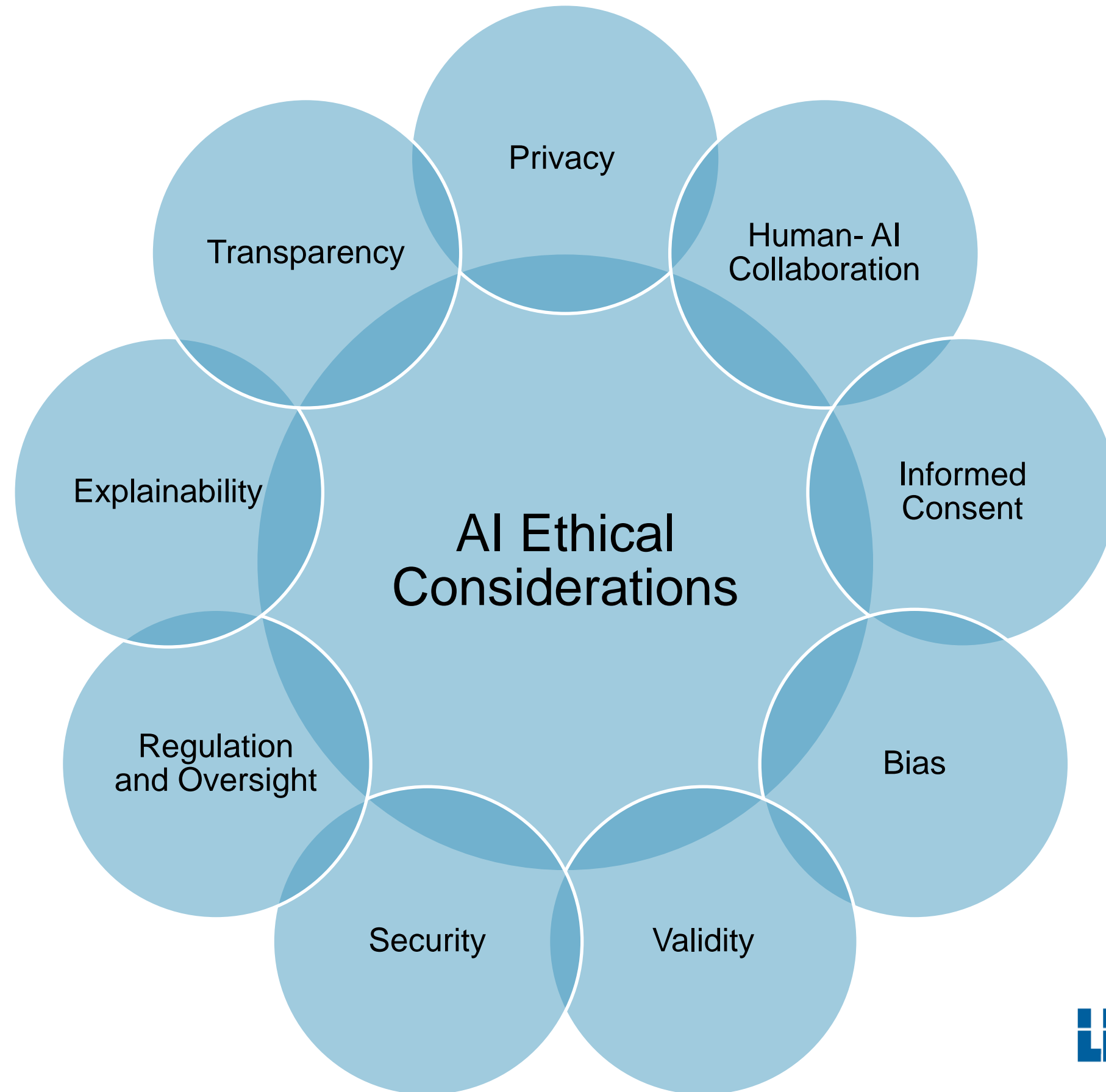
Challenges of Implementing AI in Healthcare

- **Data Quality and Accessibility**

  - AI algorithms require large amounts of accurate data for predictions.

    - Fragmented, inconsistent, privacy-regulated healthcare data

- **Integration with Existing Systems**

  - Workflows can be complex

    - Including integration without healthcare disruption or delay

  - Compatibility issues, data interoperability and system challenges

Potential Impact on Morbidity in Disability Underwriting

- **Helping analyze vast amounts of data:**

  - Medical records, lifestyle, occupation all evaluated and considered.

  - Reduces efforts required in manual underwriting, resulting in faster policy issuance and improved customer experience

- **Fairness and Elimination of Bias**

  - Fair and consistent evaluation for all applicants

  - Decrease overestimation or underestimation of risk

Potential Impact on Morbidity in Disability Underwriting

- **Enhanced Risk Assessment:**

  - AI can assess individual risk for future health conditions or current condition progression

  - Allows us better insight on how to insure our customers for disabling events while underwriting risks.
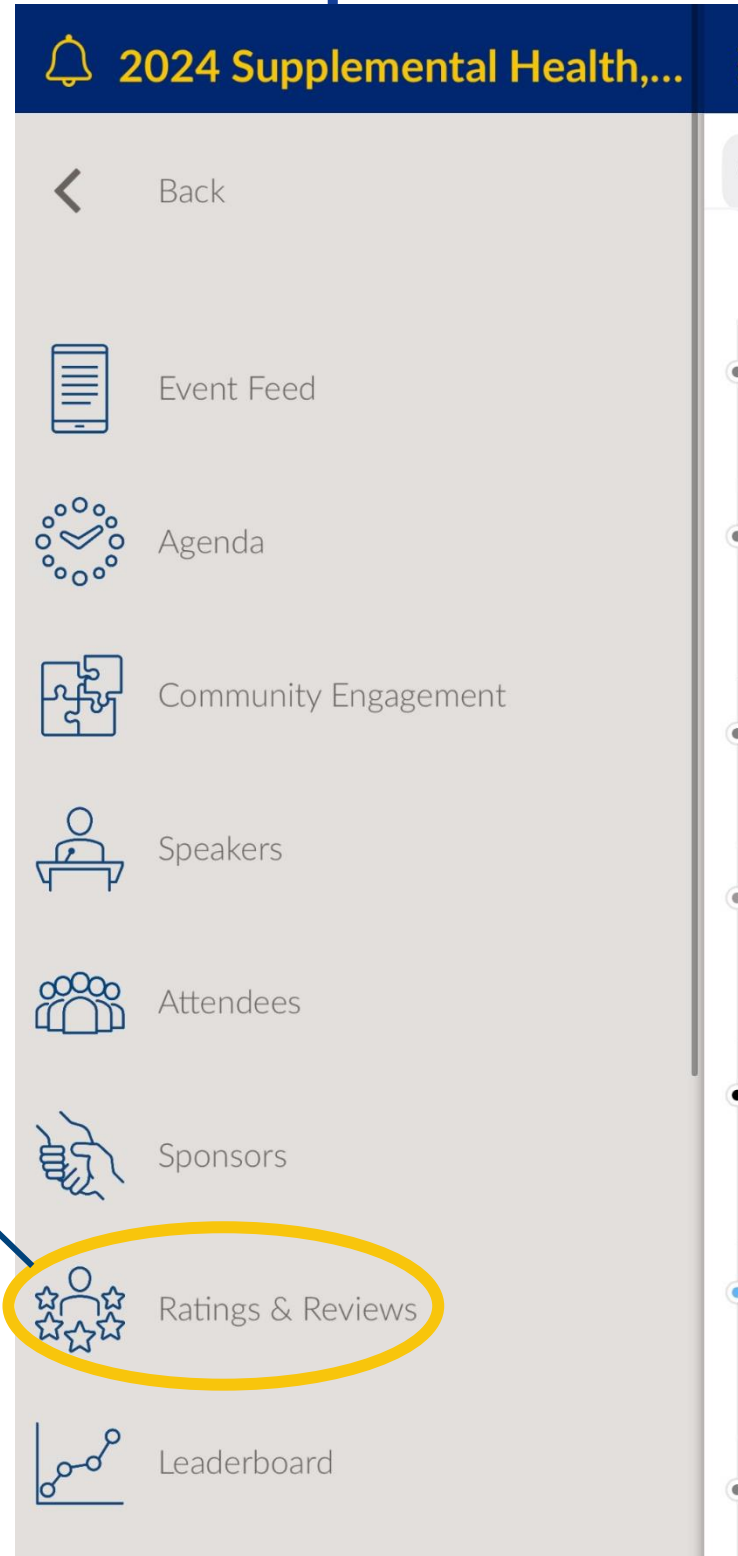
- **Improved Product Offerings**

  - Analyze datasets to identify new risk factors and trends related to disability

  - Innovative and tailored products to meet the needs of individuals
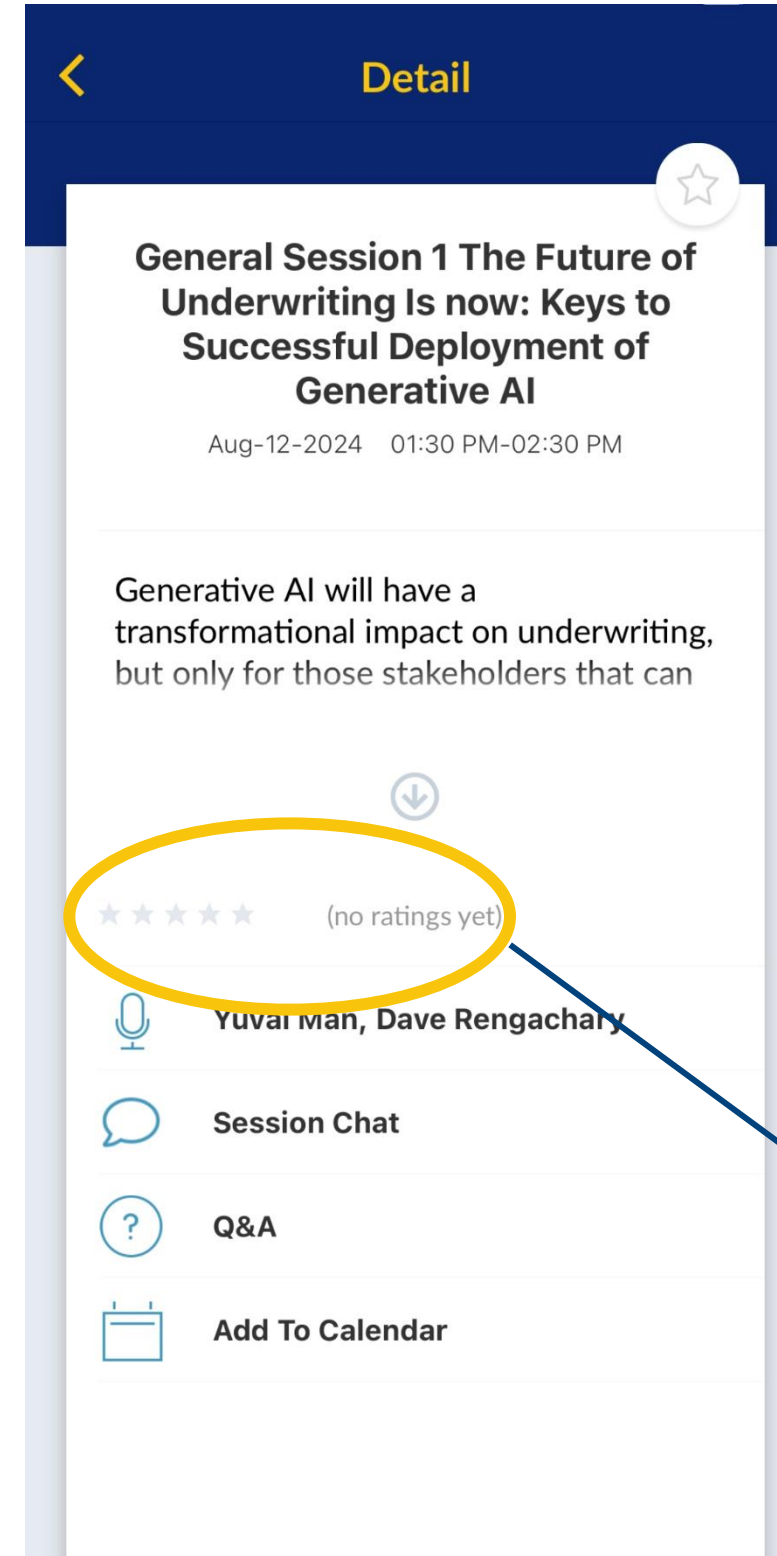
Future Direction and Opportunities

- Advancement in machine learning, deep learning, and natural learning

  - Enhance accuracy and capability.

- Individualized health assessment and management

  - Integration of AI wearable devices for real-time health monitoring and notification

- Collaboration between AI systems and healthcare professionals

  - Enhanced decision making, accuracy, treatment, and management.

- Opportunity for reduced morbidity, improved health prognosis and management

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