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Artificial Intelligence in Predicting Sepsis Risk: A Review of Recent Advances

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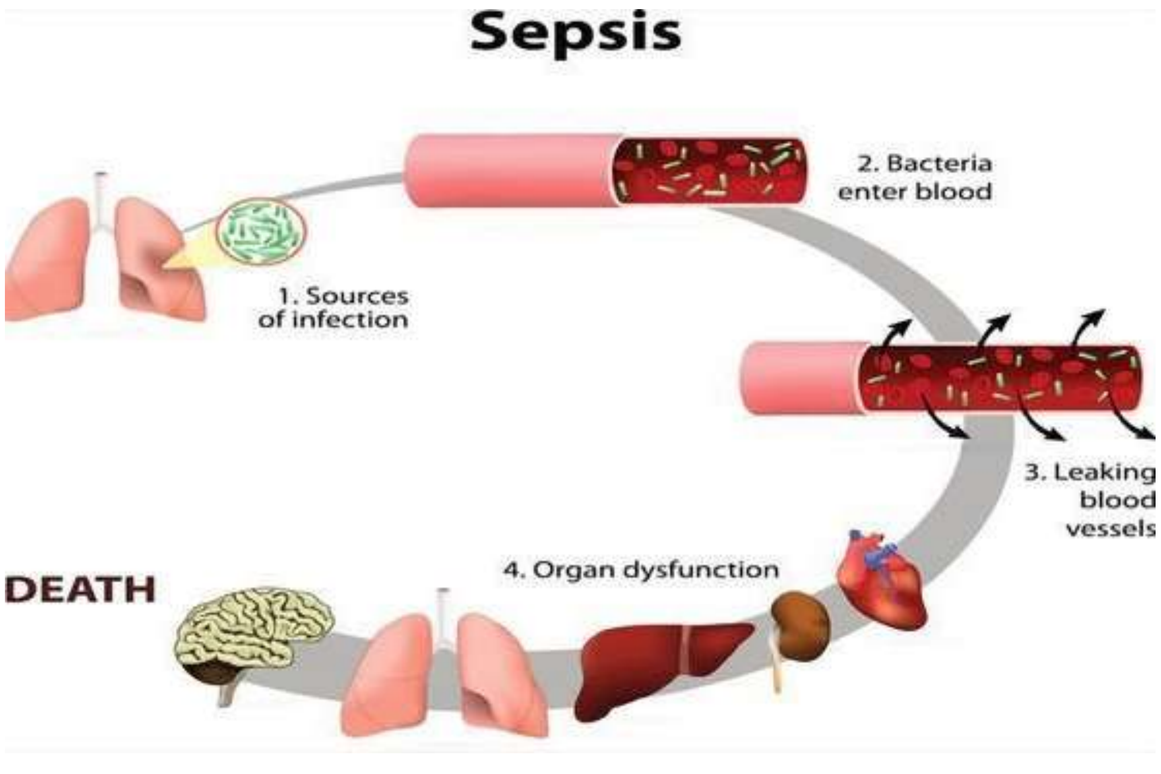
INTRODUCTION & AIM

Sepsis is a life-threatening condition associated with high morbidity and mortality, and early recognition is challenging due to nonspecific symptoms. Artificial Intelligence offers promising tools for timely prediction and risk stratification. The objective of this review is to summarize recent AI approaches for predicting sepsis risk and to evaluate their performance and clinical applicability.



https://www.technologynetworks.com/biopharma/news/metabolism-immunology-interaction-likely-to-be-important-for-understanding-sepsis-320056

METHOD

A literature review was conducted covering studies published in the last five years using PubMed, Scopus, and Web of Science. The focus was on machine learning and deep learning models applied to sepsis prediction. Performance metrics such as AUROC, sensitivity, specificity, and dataset type were extracted from the studies.

RESULTS & DISCUSSION

Machine learning models including Random Forest and Gradient Boosting achieved AUROC values between 0.80 and 0.92, while deep learning models such as LSTM and CNN reached AUROC values of 0.85 to 0.95. Integration with real-time electronic health records improved the ability to detect sepsis earlier. Challenges identified include heterogeneous data, limited interpretability of some models, and difficulties in integrating AI into clinical workflows.

Artificial Intelligence demonstrates considerable potential for enhancing early sepsis prediction and improving risk stratification. Deep learning approaches tend to outperform traditional machine learning models when temporal patterns are considered.

CONCLUSION

Successful implementation of AI in clinical practice requires attention to data quality, model interpretability, and integration into routine workflows. Future research should focus on multicenter validation, development of explainable AI, and seamless incorporation into clinical settings.

SCIENTIFIC SOURCES

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