Sepsis prediction: The golden predictors toolkit to develop artificial intelligence models.

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Introduction: Sepsis is a life-threatening condition that is associated with increased mortality. Artificial intelligence tools can inform clinical decision-making by flagging patients who may be at risk of developing infection and subsequent sepsis and assist clinicians with their care management.

Objective: To identify the optimal predictors toolkit, that is needed for highly sensitive and specific machine learning models to predict the likelihood of an infection and subsequent sepsis.

Search databases

- Medline, CINAHL, and Embase databases were examined using appropriate sets of keywords.
- Search timeframe:1st January 2000 till the 5th October 2020

Inclusion and exclusion

- Quantitative studies
- Developed predictive machine learning models
- Sepsis associated with bacterial infection
- Adult population (>18 years)
- All care settings.

Data synthesis and extraction

- A pre-designed data extraction excel sheet was used for data extraction.
- Narrative synthesis of studies.
- Quality assessment was performed using Newcastle-Ottawa Quality Assessment scale.

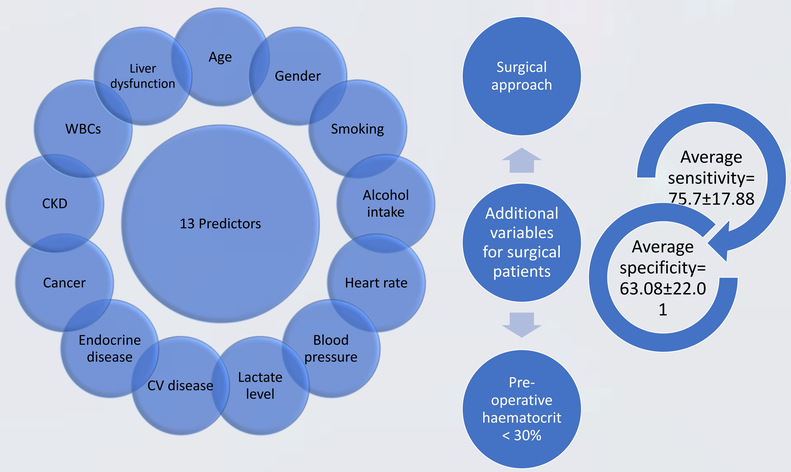
Registration

- This systematic review was registered in PROSPERO database (CRD42020158685).

Results:

17 articles | **194 Predictors**

7 modifiable predictors | **13 most prevalent predictors**



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Review article

Preventing sepsis; how can artificial intelligence inform the clinical decision-making process? A systematic review

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Discussion and conclusion:

- Discrimination power, predictive timeframe and accuracy of predictions are influenced by the type of predictors used and their relation to sepsis process.
- Ideal predictive models should consider predictors that can lengthen the prediction timeframe, to allow extra time for clinicians to take intervention reducing the risk of sepsis.
- Theses findings can guide the future development of predictive machine learning models in terms of the important considerations for models' development.

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