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a systematic review**

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# Effectiveness of monitoring patients with acute dyspnea with serial ultrasound of the lungs and inferior vena cava: a systematic review

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## Background and objective

Acute dyspnea is one of the most common complaints in the emergency department with high in-hospital mortality. The current methods of monitoring the patients lack both sensitivity and specificity. The objective of the review is to evaluate the effectiveness of monitoring patients with acute dyspnea with repeated focused ultrasound of the lungs (FLUS) and inferior vena cava (IVC) compared to standard care.

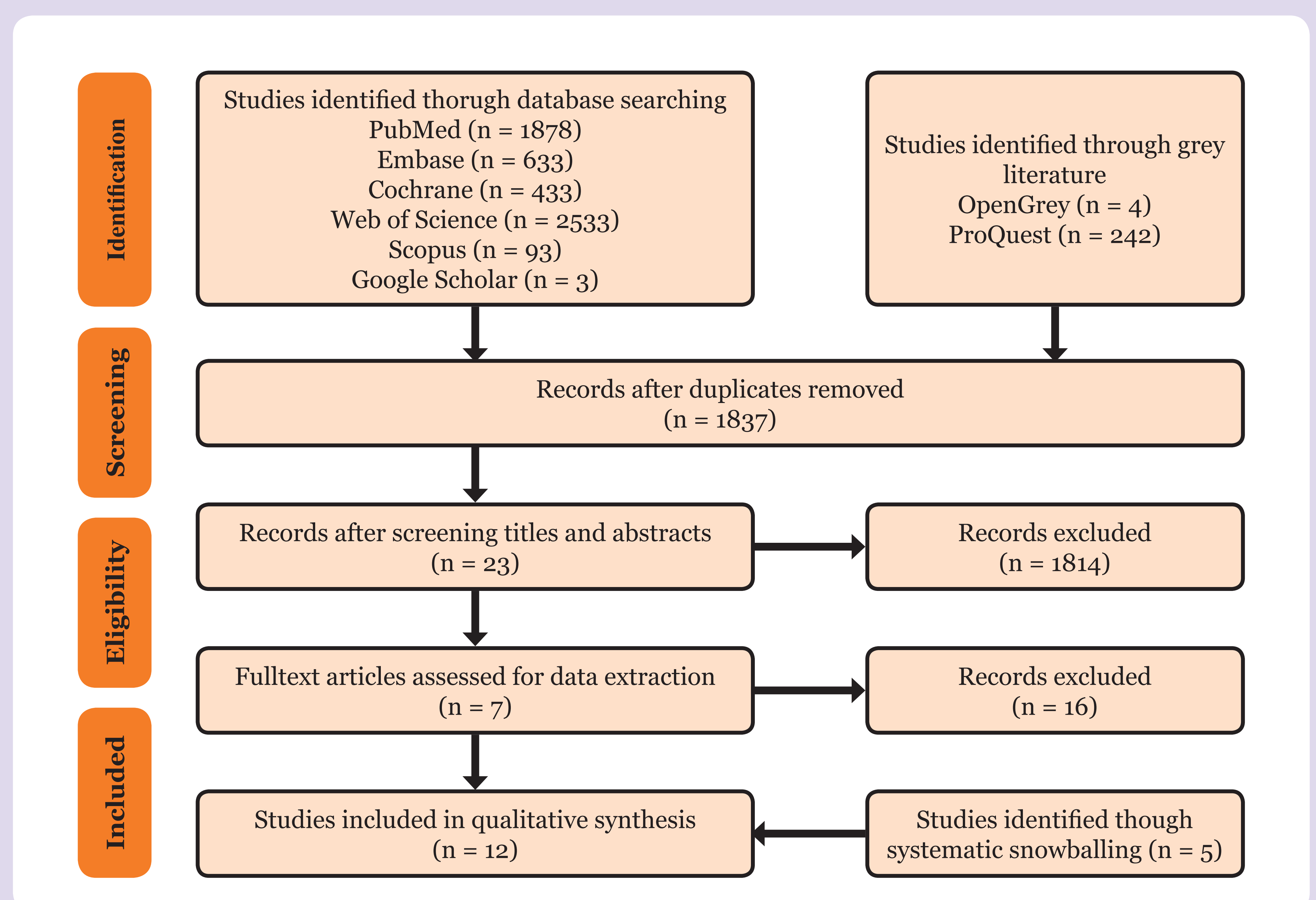
## Methods

A systematic search was conducted on 12th of June 2018 on PubMed, Embase, Cochrane, Web of Science, Google Scholar, and Scopus. The grey literature was sought in OpenGrey and ProQuest. We included trials with adult patients with acute dyspnea admitted to a hospital who underwent either repeated FLUS or IVC scans or both. In the 1837 studies identified, first titles and abstracts were screened. 23 studies were selected for full-text screening, and of those, 7 were chosen for data extraction. Additional 5 papers were identified through systematic snowballing. Risk of bias was assessed according to the study design.

## Results

Twelve studies were included (824 patients). Generally, the studies had small study populations, and no sample size calculations were made. Only patients suspected of heart failure were investigated, and the studies were methodological heterogeneous. Four studies reported that patients with a reduction in either B-lines, IVC size or an increased IVC collapsibility index (IVCCI) had fewer readmissions and deaths. Three studies reported on optimized treatment in relation to the same findings. All studies reported either a reduction of B-lines, IVC size or an increase in IVCCI as a sign of possible decreased congestion of fluid but few studies related the findings to other parameters.

**Figure 1:** PRISMA flow chart.



## Conclusions

Repeated FLUS and IVC scans showed promising results as a monitoring tool, but further investigations with larger study populations and with patients with undifferentiated dyspnea are needed to generalize the findings.



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