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# Peritoneal Dialysis in the Management of Cardiorenal Syndrome

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**ADMINISTRATIVE INFORMATION**

**Support -** NON.

**Review Stage at time of this submission -** Completed but not published.

**Conflicts of interest -** None declared.

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**Amendments -** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 7 March 2026 and was last updated on 7 March 2026.

## INTRODUCTION

**Review question / Objective** To evaluate the clinical outcomes associated with peritoneal dialysis therapy in patients with cardiorenal syndrome, including effects on all-cause mortality, heart failure–related hospitalization, functional status, and cardiac function.

**Rationale** Cardiorenal syndrome is characterized by the complex interaction between heart failure and renal dysfunction, often resulting in refractory congestion, diuretic resistance, and recurrent hospitalizations. Peritoneal dialysis has been proposed as a strategy for chronic fluid removal in these patients because it provides continuous ultrafiltration with good hemodynamic tolerance. However, available evidence is mainly derived from observational studies and the overall clinical impact of this therapy remains uncertain. Therefore, a systematic review and meta-analysis was conducted to synthesize current evidence regarding the outcomes of peritoneal dialysis in patients with cardiorenal syndrome.

**Condition being studied** Cardiorenal syndrome associated with advanced heart failure and refractory fluid overload.

## METHODS

**Search strategy** A systematic literature search was performed in PubMed, Embase, Cochrane CENTRAL, and Scopus from database inception to January 2026. The search strategy combined Medical Subject Headings (MeSH) and free-text keywords including “cardiorenal syndrome,” “heart failure,” “peritoneal dialysis,” and “peritoneal ultrafiltration.” Reference lists of relevant articles were also screened to identify additional studies.

**Participant or population** Adult patients with cardiorenal syndrome and refractory heart failure treated with peritoneal dialysis.

**Intervention** Peritoneal dialysis as a chronic ultrafiltration strategy in patients with cardiorenal syndrome.

**Comparator** Standard heart failure medical therapy or pre-treatment clinical status prior to peritoneal dialysis.

**Study designs to be included** Prospective and retrospective observational cohort studies assessing peritoneal dialysis in patients with cardiorenal syndrome.

**Eligibility criteria** Studies were eligible if they included adult patients with cardiorenal syndrome who underwent chronic peritoneal dialysis therapy and reported at least one prespecified outcome such as mortality, hospitalization, functional status, or cardiac function. Both prospective and retrospective observational cohort studies were considered. Case reports, pediatric studies, studies involving acute dialysis, and studies without relevant outcome data were excluded.

**Information sources** Electronic databases including PubMed, Embase, Cochrane CENTRAL, and Scopus were searched from database inception through January 2026. In addition, reference lists of relevant articles and reviews were screened to identify additional eligible studies.

**Main outcome(s)** The primary outcome is all-cause mortality in patients with cardiorenal syndrome undergoing chronic peritoneal dialysis therapy.

**Quality assessment / Risk of bias analysis** The methodological quality of included studies will be assessed using the Newcastle–Ottawa Scale (NOS) for observational studies. This tool evaluates studies across three domains: selection of study groups, comparability of groups, and assessment of outcomes. Studies will be categorized according to their overall risk of bias based on the total score.

**Strategy of data synthesis** A quantitative synthesis (meta-analysis) will be performed when sufficient data are available. Pooled estimates will be calculated using random-effects models to account for between-study variability. Effect measures will be expressed as risk ratios for dichotomous outcomes and mean differences for continuous variables. Statistical heterogeneity will be assessed using the $I^2$ statistic. When meta-analysis is not appropriate, results will be summarized narratively.

**Subgroup analysis** No predefined subgroup analyses were planned due to the limited number of eligible studies and heterogeneity in study design and patient populations.

**Sensitivity analysis** No formal sensitivity analysis was planned due to the limited number of included studies and the observational nature of the available evidence.

**Country(ies) involved** Saudi Arabia – King Abdulaziz University, Jeddah.

**Keywords** cardiorenal syndrome; peritoneal dialysis; heart failure; ultrafiltration; systematic review; meta-analysis.

**Contributions of each author**

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