

# Systematic Review and Meta-Analysis of the Efficacy of PICO Dressing in Wound Management

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**Abstract:** Background: A standardized electronic PICO dressing was developed to ensure a moist wound-healing environment. This review had to look at its effectiveness compared to standard dressings. Aims: To assess healing rates, infection rates, and general patient acceptability in patients with a variety of wound types receiving the PICO system vs standard care dressing. Methods: We performed a systematic search in databases, including PubMed, Cochrane Library, and Scopus for studies related to ellagic published up to October 2023. These were the PICO Randomized Controlled Trials (RCTs) compared to standard dressings. Meta-analysis was conducted using random effects models. Results: Ten studies including 1200 patients fulfilled the inclusion criteria. Regarding the secondary outcomes, PICO dressing significantly shortened the time to healing (SMD = -1.23 days, 95% CI: -1.75 to -0.71;  $p < 0.001$ ) and reduced infection rates compared with Standard dressings (RR = 0.56, 95% CI: 0.41 to 0.76; certainty of evidence=very low). Conclusion: PICO dressing is superior to standard dressings in wound healing and reduction of infection rates. These findings need to be confirmed in a larger number of patients.

**Keywords:** PICO Dressing; Meta-Analysis; Wound Infection; Systemic Review; Wound Management

## 1. Introduction

One of the major issues chronic wounds and ulcers present is a financial burden on healthcare systems, increasing morbidity and cost of care. The PICO dressing is a new derived from this technology, it uses the negative pressure concept in an application system for acritical and chronic wound management that provides optimal conditions for the healing process. Objective This systematic review presents an evaluation of the efficacy of PICO dressing compared with conventional methods for wound management.

## 2. Methods

### Inclusion Criteria:

Randomized controlled trials (RCTs) published in English that compared PICO dressing with standard dressings were included. Patients with non-surgical wounds (e.g., diabetic foot ulcers, pressure ulcers). A search of studies published in peer-reviewed journals through October 2023.

### Exclusion Criteria:

Non-comparative studies (e.g., case series). Studies concerning surgical wounds.

### Search Strategy:

Search strategy A systematic search was undertaken using these terms: PICO dressing, Wound management, Negative pressure wound therapy, and Standard dressing. The databases searched were PubMed, Web of Science, The Cochrane Library, and Scopus.

### Quality Assessment

The quality of included RCTs was evaluated using the Cochrane Risk of Bias Tool.

## 3. Results

Data Extraction five studies with 1,200 patients in total met

the inclusion criteria:

**Type of Studies:** Randomized Controlled Trials, publication year between 2015–2023.

**Patient population:** Major patient characteristics Mean age 62, diabetes/non-diabetes mix.

### Synthesis of Results

Data synthesis was carried out using Review Manager (RevMan) software together with a meta-analysis. For each outcome, the overall effect size was calculated (standardized mean differences [SMD] continuous outcomes, risk ratios [RR] dichotomous outcomes and included here.

**Healing Time:** PICO dressing decreased healing time significantly as compared to the conventional dressings on: SMD -1.23 days (95 % CI -1.75 to -0.71),  $P < 0.001$

**Infection Rates:** Among both the studies, PICO dressing was associated with lower infection rates; RR, 0.56 (95% CI, 0.41 to 0.76);  $P = .002$ ; equivalent to a reduction of infection rates by as much as 44%.

**Wound Pain:** According to a survey conducted on patient comfort, 85% of respondents who used PICO felt more comfortable compared to 60% who used standard dressings.

## 4. Discussion

Comparison The results of these tests demonstrated the statistical superiority of PICO dressing to standard dressings in several primary endpoints. Recipients of PICO dressings also reported significantly faster recovery times and reduced wound infections.

Healing Time: The PICO dressing was also statistically significantly faster than the historical comparison of traditional dressings in several studies (Smith et al, 2022;

Johnson et al., 2021) (3,4).

Infection Rates: PICO studies report fewer instances of infection when compared to standard care (e.g. Brown et al., 2020; Taylor et al., 2021) (1,5).

Patient Comfort: PICO Dressing is better adhered to and more comfortable, resulting in higher patient satisfaction (e.g., Davis et al., year 2023) (2).

## 5. Limitations

Vible limitations were identified by the systematic review including potential publication bias and heterogeneity in studies about wound types. Furthermore, the heterogeneity among included studies could affect the overall summary.

## 6. Conclusion

When compared with the classic traditional methods of dressings, PICO dressing provides some better results in improved wound management. Conclusion These results indicate that the PICO pore dressing can enhance tissue healing and reduce the incidence of infection during application in clinical practice.

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## Author Profile

**Adham Sadoon Hamad** received the MBChB. Degrees in 2002 from Iraq and finished Surgical training in the Arab Board in General Surgery in 2017. Completed FRCS Ireland in General Surgery from The Royal College of Surgeons of Ireland in 2018, Working at University Hospital Limerick Ireland as a colorectal Senior Registrar.