

# INPLASY PROTOCOL

To cite: Gan et al. Impact of peripherally inserted central venous catheter associated phlebitis in Neonate guided by intracavitary

electrocardiogram: A Systematic Review and Meta-analysis. Inplasy protocol 202280012. doi: 10.37766/inplasy2022.8.0012

Received: 03 August 2022

Published: 03 August 2022

**Corresponding author:**  
Menglin Tang

tangmenglin777@163.com

**Author Affiliation:**  
Department of Pediatrics  
Intensive Care Unit, West  
China Second University  
Hospital

**Support:** West China Hospital.

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

**Conflicts of interest:**  
None declared.

## Impact of peripherally inserted central venous catheter associated phlebitis in Neonate guided by intracavitary electrocardiogram: A Systematic Review and Meta-analysis

Gan, WY<sup>1</sup>; Hu, L<sup>2</sup>; Luo, YL<sup>3</sup>; Tang, ML<sup>4</sup>.

**Review question / Objective:** This paper aims to report a meta-analysis of phlebitis prevalence by pooling estimations from individual studies, providing evidence for the PICC treatment.

**Condition being studied:** Phlebitis as a common complication associated with PICC lines and the inflammation of the tunica intima of the vein, may lead to further consequences, such as discomfort, damage of affected veins, missed medication doses, significant morbidity or mortality, and a subsequent longer hospital stay with increased treatment costs. PICC is a highly recommended venous infusion technique which provides long-term intravenous medication and nutrition to critically ill newborns in neonatal intensive care units. Proper placement of the catheter tip play a crucial role in ensuring the effectiveness of PICC. In clinical studies, incorrect tip placement is accompanied by the risk of phlebitis. As phlebitis is irreversible, early diagnosis and treatment are particularly important for neonates with PICC.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 03 August 2022 and was last updated on 03 August 2022 (registration number INPLASY202280012).

### INTRODUCTION

**Review question / Objective:** This paper aims to report a meta-analysis of phlebitis prevalence by pooling estimations from individual studies, providing evidence for the PICC treatment.

**Condition being studied:** Phlebitis as a common complication associated with PICC lines and the inflammation of the tunica intima of the vein, may lead to further consequences, such as discomfort, damage of affected veins, missed medication doses, significant morbidity or

mortality, and a subsequent longer hospital stay with increased treatment costs. PICC is a highly recommended venous infusion technique which provides long-term intravenous medication and nutrition to critically ill newborns in neonatal intensive care units. Proper placement of the catheter tip play a crucial role in ensuring the effectiveness of PICC. In clinical studies, incorrect tip placement is accompanied by the risk of phlebitis. As phlebitis is irreversible, early diagnosis and treatment are particularly important for neonates with PICC.

## METHODS

**Participant or population:** Neonates with PICC catheterization.

**Intervention:** Intracavitary electrocardiogram (IC-ECG) examination.

**Comparator:** X-ray chest examination.

**Study designs to be included:** Randomized Controlled Trial (RCT).

**Eligibility criteria:** The following inclusion criteria were implemented: (1) RCTs of intracavitary electrocardiogram-guided PICC tip placement in the treatment of neonates; (2) all patients were diagnosed with PICC. The experimental group received treatment with intracavitary electrocardiogram while the control group received the conventional X-ray chest examination. Other clinical treatments were the same on the two groups. (3) The indicators for phlebitis estimation were reported. The exclusion criteria included (1) duplicate publications; (2) studies which failed to provide sufficient original data.

**Information sources:** PubMed, Google Scholar, Cochrane library and CNKI.

**Main outcome(s):** The incidence of phlebitis.

**Additional outcome(s):** The success rate of catheterization.

**Quality assessment / Risk of bias analysis:** The second version of the Cochrane risk of bias tool (RoB 2.0) was used to evaluate the methodological quality and risk of bias of included RCTs, and any disagreement concerning the quality evaluation was resolved by discussion and consensus.

**Strategy of data synthesis:** The STATA 17.0 software was adopted in this study to perform a meta-analysis of the included literature. Odds ratio (OR) was used to describe dichotomous variables, mean difference (MD) was used to describe continuity variables, and all effect sizes were expressed as 95% confidence interval (CI).  $P < 0.05$  suggests that the difference between the experimental group and the control group was statistically significant.

**Subgroup analysis:** We conducted subgroup analyses to explore statistical heterogeneity across trials. We focused on the following effect modifier: preterm neonates.

**Sensitivity analysis:** None.

**Country(ies) involved:** China.

**Keywords:** Phlebitis, Intracavitary electrocardiogram, PICC, Neonate, Meta-analysis.

**Contributions of each author:**

Author 1 - Menglin Tang.

Author 2 - Wenyi Gan.

Author 3 - Lin Hu.

Author 4 - Yulan Luo.