

# Femoral Occlusion in Neonatal Cardiac Resuscitation: Ovine Model Outcomes

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## Introduction

Neonatal cardiac resuscitation is a critical intervention performed to restore cardiac function in newborns experiencing cardiac arrest or severe cardiovascular compromise. One of the challenges in neonatal resuscitation is achieving effective perfusion during chest compressions, particularly in cases of congenital heart disease or compromised vascular access. Femoral artery occlusion, achieved through manual compression or mechanical devices, has been proposed as a means to enhance central perfusion during neonatal cardiac resuscitation [1]. The Ovine Model Outcomes study aims to investigate the efficacy and safety of femoral occlusion in improving hemodynamic outcomes and survival in neonatal cardiac arrest using an ovine model. This paper provides a comprehensive introduction to the Ovine Model Outcomes study, outlining its objectives, methodology and potential implications for clinical practice and neonatal resuscitation guidelines. The Ovine Model Outcomes study seeks to address this knowledge gap by rigorously evaluating the effects of femoral artery occlusion on hemodynamic outcomes and survival in a preclinical ovine model of neonatal cardiac arrest. By utilizing an animal model that closely approximates human physiology and anatomy, the study aims to provide valuable insights into the physiological mechanisms underlying femoral occlusion and its impact on cardiac function, tissue perfusion and neurodevelopmental outcomes in newborns undergoing resuscitation [2].

## Description

The Ovine Model Outcomes study is a preclinical research endeavor designed to evaluate the effects of femoral artery occlusion on hemodynamic outcomes and survival in neonatal cardiac arrest. The study utilizes an ovine model of neonatal cardiac arrest, which closely mimics physiological and anatomical characteristics of human newborns, to assess the feasibility and safety of femoral occlusion during chest compressions. The rationale for femoral artery occlusion in neonatal cardiac resuscitation stems from the need to optimize central perfusion and organ blood flow during chest compressions. In newborns with congenital heart disease or compromised vascular access, achieving effective perfusion can be challenging, leading to suboptimal outcomes and increased mortality. Femoral artery occlusion redirects blood flow from the lower extremities to the central circulation, potentially enhancing coronary and cerebral perfusion pressures during chest compressions [3].

The Ovine Model Outcomes study employs a rigorous experimental design to evaluate the effects of femoral occlusion on key hemodynamic parameters, including mean arterial pressure, coronary perfusion pressure and cerebral

blood flow. Newborn lambs undergo induction of cardiac arrest through ventricular fibrillation or asphyxia, followed by standardized resuscitation protocols incorporating femoral occlusion techniques. Hemodynamic monitoring and advanced imaging modalities, such as echocardiography and near-infrared spectroscopy, are used to assess cardiac function and tissue oxygenation during resuscitation. In addition to hemodynamic outcomes, the Ovine Model Outcomes study evaluates survival rates, neurodevelopmental outcomes and long-term morbidity in newborn lambs subjected to femoral artery occlusion during cardiac resuscitation. Behavioral assessments, neuroimaging studies and histopathological analyses are performed to evaluate neurological function and tissue injury following resuscitation. Comprehensive data collection and statistical analysis allow for robust interpretation of study findings and identification of potential benefits and risks associated with femoral occlusion techniques [4,5].

## Conclusion

In conclusion, the Ovine Model Outcomes study represents a significant research effort aimed at improving outcomes in neonatal cardiac resuscitation through the use of femoral artery occlusion techniques. By utilizing an ovine model of neonatal cardiac arrest, the study provides valuable insights into the physiological effects of femoral occlusion on hemodynamic stability, organ perfusion and survival in newborns undergoing resuscitation. The findings of the Ovine Model Outcomes study have the potential to inform clinical practice and neonatal resuscitation guidelines, guiding the development of evidence-based strategies to optimize cardiac resuscitation outcomes in newborns with congenital heart disease or compromised vascular access. Additionally, the study highlights the importance of preclinical research in advancing our understanding of complex clinical scenarios and informing the design of future clinical trials aimed at improving outcomes in neonatal cardiac resuscitation.

## Acknowledgment

None.

## Conflict of Interest

No conflict of interest.

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Received: 01 April, 2024, Manuscript No. jhoa-24-135064; Editor Assigned: 03 April, 2024, PreQC No. P-135064; Reviewed: 15 April, 2024, QC No. Q-135064; Revised: 20 April, 2024, Manuscript No. R-135064; Published: 27 April, 2024, DOI: 10.37421/2167-1095.2024.13.454

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**How to cite this article:** Kutkutiamol, Jethiya. "Femoral Occlusion in Neonatal Cardiac Resuscitation: Ovine Model Outcomes." *J Hypertens* 13 (2024): 454.