

# Papaverine Prolonging the Patency of Peripheral Arterial Catheters in the Neonatal Intensive Care Unit

## Problem

- Critically ill infants often require long-term peripheral arterial lines to monitor blood pressures and provide access for frequent blood gas monitoring.
- Neonatal vessels are prone to vasospasms that decrease the duration of the line.
- Peripheral artery vasospasm and occlusion is a very serious complication of peripheral arterial lines.
- A decreased arterial blood flow to the affected limb can deprive the tissue of its essential components to survive.
- Increasing line duration is important in decreasing painful procedures and decreasing infection rates in the NICU
- Papaverine, an anti-vasospastic drug used in the adult population, has had little research conducted in the neonatal population.

## Literature Review

- Review of the current literature on the use of papaverine in the Neonatal Intensive Care Unit is very limited and the Federal Drug Administration has not approved the drug for safe use.
- Papaverine relaxes the smooth musculature of larger blood vessels, especially coronary vessels, systemic peripheral vessels and pulmonary arteries. The vasodilatory effect is thought to be related to its ability to inhibit cyclic nucleotide phosphodiesterase, thus increasing levels of intracellular cyclic AMP (Young & Mangum, 2011).
- Griffin & Siadaty studied papaverine infusion in the neonatal population and found it significantly prolonged the duration of the catheter (Griffin & Siadaty, 2005).

by  
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## Methodology

- **Sample:** n = 30 NICU patients in each group with peripheral arterial lines (PAL)
- **Group 1:** Without papaverine infusing in PAL line
- **Group 2:** With papaverine infusing in PAL line
- **Design** – Retrospective Chart Review in NICU at Children’s Hospital and Medical Center-Omaha
- Noted if patients had congenital heart disease or IVH before/after papaverine administration
- **Data Analysis:** Independent Samples T-test

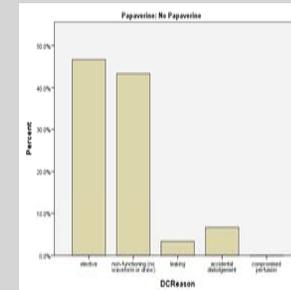
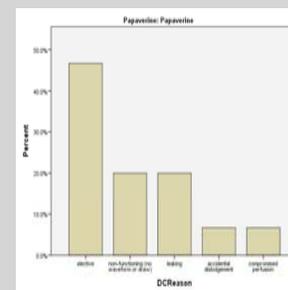
## Demographics of Subjects

- Gestational age at the insert of the line ranged from 23 weeks to 62 weeks.
- 8 out of 30 patients containing papaverine in the PAL had Congenital Heart Disease
- 6 out of 30 patients had Intraventricular Hemorrhage before treatment with only 2 patients having an increase in IVH after treatment



## Results

- There was no significant difference in line duration with papaverine (M= 5.5, SD= 4.2) than without papaverine (M=4.5, SD=4.2, p=.307, df= 58).
- There was no significant difference in line duration in patients with congenital heart disease and those without heart disease (p= .891, df = 58).
- 2 patients had an increase in IVH after papaverine use.



## Discussion

- We cannot conclude that using papaverine in peripheral arterial lines will significantly increase the line duration.
- A peripheral arterial line with papaverine infusing lasted a mean of 1 day longer than lines without papaverine.
- An increase in line duration by one day can be significant enough to reduce frequent painful procedures and introduction of sepsis in the extremely premature infant.
- Line duration did not seem to be impacted by infants with congenital heart disease and also did not further intraventricular hemorrhage in patients with previous intraventricular hemorrhage before papaverine infusion.