



# Prenatal Diagnosis, Birth Location, Surgical Center, and Neonatal Mortality in Infants with Hypoplastic Left Heart Syndrome

Morris SA, Ethen MK, Penny DJ, Canfield MA, Minard CG, Fixler DE, Nembhard WN. Prenatal diagnosis, birth location, surgical center, and neonatal mortality in infants with hypoplastic left heart syndrome. *Circulation*. 2014;129(3): 285-292.

*This study, the first of its kind, used 9 years of data (1999-2007) from the Texas Birth Defects Registry to examine the effect of calculated driving time from birth center to cardiac surgical center (CSC) on mortality among infants with hypoplastic left heart syndrome (HLHS). Researchers also examined the associations between prenatal diagnosis, CSC HLHS volume, and mortality.*

For more information, please contact Dr. Shaine A. Morris at Baylor College of Medicine, Houston (shainem@bcm.edu).

Link to abstract:

<http://www.ncbi.nlm.nih.gov/pubmed/24135071>

## Main findings from this research

- ◇ Of 558 patients that met strict criteria for HLHS, 95 were excluded due to extracardiac birth defects, known genetic disorders, or being a twin, leaving a total of 463 cases for analysis.
- ◇ For infants born less than 10 minutes from a CSC, neonatal mortality (death before 28 days of age) was 21.0%. For those born between 10 and 90 minutes from a CSC, neonatal mortality was 25.2%, and for those born more than 90 minutes away, neonatal mortality was 39.6% (p value for trend <0.001). Therefore, there was a significant increase in neonatal mortality with increasing driving time from birth center to a CSC.
- ◇ When compared with infants born less than 10 minutes from a CSC, even when controlling for other factors like low birthweight, delivery more than 90 minutes from a CSC was associated with two-fold higher odds of neonatal mortality (adjusted odds ratio (OR), 2.03; 95% confidence interval (CI), 1.19-3.45).
- ◇ In 39% of newborns, HLHS was prenatally diagnosed, but no association was found between prenatal diagnosis alone and improved survival (p=0.14).
- ◇ Substantially higher pre-transport mortality was found in infants born greater than 90 minutes from a CSC (adjusted OR, 6.69; 95% CI, 2.52-17.74).
- ◇ Lower surgical mortality was associated with higher CSC volume, with an adjusted OR of 0.88 per 10 HLHS patients (95% CI, 0.84-0.91), meaning the odds of neonatal death decreased by 12% for every 10 additional HLHS patients seen in a CSC.

## Conclusion and discussion

Increased neonatal mortality was found in infants with HLHS born far from a CSC. Therefore, improving prenatal diagnosis, which allows planning of delivery near a large volume CSC, may improve survival in infants with HLHS.