

**Can audit lead to improved outcome in critical congenital heart disease?**

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**Introduction:**

Primary repair of congenital heart disease now has low mortality, but palliation remains sometimes appropriate. With increasing complexity of treated disease, the relative risk of palliation appears to be increasing. Routine audit of our management led us to change our approach in three different time periods. This study documents how altering our approach impacted on outcome.

**Methods:**

Retrospective analysis was performed of first shunt (MBTS) for inadequate pulmonary blood flow. Three periods were audited 2002-2006, 2007-2011 and 2012-2015. After each audit, a change in approach aimed to improve outcome. Adverse outcomes, defined as shunt failure (blockage, redo or additional early MBTS) or death, are presented with median (interquartile range) and p values (Kruskal-Wallis).

**Results:**

In total 137 children underwent first MBTS, 60 were performed at 18 (7-47) days age in 2002-2006 (period A) (78% had thoracotomy), 51 at 9 (6-34) days from 2007-2011 (period B) (41% thoracotomy) and 26 at 12 (8-19) days 2012-2015 (period C) (5% thoracotomy, period A vs C %thoracotomies  $p=0.0001$ ). Median weight at time of MBTS fell from 3.4 to 3.1Kg from period A to C,  $p=ns$ . The number undergoing MBTS with functional single ventricle was stable during the study period (period A=15, B=14, C=13), but the number of patients with two ventricles decreased from 45 (period A) to 13 (period C)  $p=0.043$ . Despite increased complexity of cases, adverse outcome rate did not change for MBTS (A 42%, B 41% and C 40%). In period A we saw MBTS blockages, in period B there was more pulmonary over-circulation and in the last we performed alternative interventions (eg outflow tract stent, duct stent, or sano shunt,  $n=48$ ) in increasing frequency (MBTS in 4.8% of all operations in period A and 1.8% in C,  $p=0.0001$ ) despite a rise in overall number of operations. Only 3 deaths occurred with alternative intervention, so that adverse events for all conditions fell significantly during the study period (period A=42% vs C=26%  $p=0.04$ ).

**Conclusion:**

With improved operative outcomes, the MBTS is now regarded as high risk. A program of repeated audit, planning allows adverse outcomes to be minimised with alternative interventional strategy.