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**Title:** Evaluation of the 'anatomic shunt test' in clinical practice

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**Body:** Introduction Detection of right-to-left shunting may not be clinically straightforward. The 100% oxygen method can be used to quantify shunting as a percentage of cardiac output; where more than 5% shunt exists the likelihood of an anatomic shunt is said to be high. However the clinical value of this test is not established. We conducted a clinical case review of the technique. Method The 100% oxygen method was performed in 189 patients at the Royal Brompton Hospital from 1997 to 2012. Clinical notes from 80 patients were retrievable and analysed. Results The main indication for testing was disproportionate hypoxia (61%). 39% of patients underwent contrast echocardiography, 39% underwent transthoracic echocardiography and 20% underwent cardiac catheterisation. There was a significant difference ( $p=0.008$ ) in the median shunt percentage between patients with an anatomical shunt was identified (10.2 %) and those without (4.8%). Age ( $p=0.16$ ), gender ( $p=0.40$ ) or resting PaO<sub>2</sub> on air ( $p=0.09$ ) were not different between positive and negative cases. A receiver operating characteristic (ROC) curve was plotted based on ability of the shunt test to identify a clinically relevant anatomical shunt defined as a positive bubble echo or findings on cardiac catheterisation: a cutoff of 8.3% yielded a sensitivity of 80% and a specificity of 80% for identifying a shunt. The area under the curve was 0.7. Conclusion The 100% oxygen method is a safe and relatively straightforward technique as a firstline investigation to identify an anatomical shunt; values >8% merit further investigation.