Comment on Point:Counterpoint: Hypoxia is/is not the optimal means of reducing pulmonary blood flow in the preoperative single ventricle heart

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TO THE EDITOR: I congratulate and thank Ebenroth (3) and Liske and Aschner (5) for their interesting, informative, and well-written Point:Counterpoint article. The physiology in patients with single ventricle, the distribution of flow to the systemic and pulmonary circulations, which are in parallel, largely depends on the relative resistances in the respective vascular beds. The goal of preoperative circulatory management in patients with single ventricle hearts is balancing the flow to lungs and body (6). Keeping pulmonary-to-systemic blood flow ratio (Qp/Qs) <1 is the goal in these patients (1). According to our clinical knowledge, the Qp/Qs ratio can be manipulated by modifying pulmonary vascular resistance (6). An increase in pulmonary vascular resistance can be obtained by decreasing the concentration of inspired oxygen by adding supplemental nitrogen via nasal cannula or adding supplemental inspired CO₂ to the ventilator circuit (4, 6). Hypoxia that causes contraction of pulmonary resistance vessels, in contrast to the vasodilator response of systemic resistance vessels, is an important mechanism by which pulmonary blood flow is controlled in the fetus and by which local lung perfusion is matched to ventilation in the adult. Hypoxia is well tolerated in patients with single ventricle hearts. The persistence of fetal hemoglobin, which possesses a higher affinity than adult hemoglobin for oxygen, in these infants allows for better tissue oxygen delivery at hypoxia (2). In conclusion, according to my opinion, like Ebenroth, hypoxia is the main factor of reducing pulmonary blood flow in the preoperative single ventricle heart.

REFERENCES