

ASTS Position Statement on vascular ligation and/or venting of the aortic arch vessels during Thoracoabdominal Normothermic Regional Perfusion (TA-NRP)

“The ASTS is committed to advancing organ donation in a manner that both maximizes the number of lives saved and upholds the safety, dignity, and respect of organ donors—without whom transplantation would not be possible. During the NRP process, it is important to ensure that in-situ perfusion is limited to the regions (abdominal or thoracoabdominal) necessary for organ recovery. While emerging evidence continues to support the absence of cerebral blood flow during NRP, the ASTS affirms the importance of taking every reasonable precaution to ensure donor safety throughout the process. Accordingly, the ASTS recommends both occlusion and venting of the aortic arch vessels during TA-NRP until more definitive evidence becomes available. This recommendation reflects the Society’s commitment to maintaining the highest professional standards and sustaining the public’s trust in the national organ donation and transplantation system.”

There is broad consensus that during NRP it is important to ensure that in-situ perfusion is limited to the regions (abdominal or thoracoabdominal) necessary for organ recovery. Multiple studies have specifically examined the absence of cerebral blood flow during NRP. The first study assessed cerebral circulation during abdominal NRP (A-NRP), in which the thoracic aorta was occluded with an intra-aortic balloon, and during thoracoabdominal NRP (TA-NRP), in which the arch vessels were clamped and their cephalad ends vented to the atmosphere [1]. Intracranial arterial blood pressure (ICBP) was directly measured at the circle of Willis. In all A-NRP and TA-NRP cases, ICBP remained unchanged, while pressures increased appropriately in the targeted regions of in-situ perfusion (abdominal or thoracoabdominal).

A second study evaluated brain perfusion during NRP in DCD donors using perfusion scintigraphy with technetium-99m hexamethylpropyleneamine oxime as the radiotracer [2]. In A-NRP, the supraceliac aorta was occluded with an endoaortic balloon, while in TA-NRP, the aortic arch vessels were clamped with cephalad ends vented to the surgical field. A portable gamma camera acquired three 5-minute static brain images in the operating room. No radiotracer uptake was detected in the brainstem or cerebral hemispheres, confirming the absence of cerebral perfusion in all 20 adult DCD donors during NRP.

[1] Royo-Villanova M, Miñambres E, Sánchez JM, Torres E, Manso C, Ballesteros MÁ, Parrilla G, de Paco Tudela G, Coll E, Pérez-Blanco A, Domínguez-Gil B. Maintaining the permanence principle of death during normothermic regional perfusion in controlled donation after the circulatory determination of death: Results of a prospective clinical study. *Am J Transplant*. 2023 Sep 20:S1600-6135(23)00696-2.

[2] Royo-Villanova M, Sánchez JM, Moreno-Monsalve T, Contreras J, Ortín A, Vargas H, Murcia CM, Llosa MM, Coll E, Pérez-Blanco A, Domínguez-Gil B. A scintigraphic look at the dead donor rule in donation after the circulatory determination of death with the use of normothermic regional perfusion: A single-center interventional trial. *Am J Transplant*. 2025 Aug;25(8):1670-1676.