The study by Wallinder et al. in this issue [1] of the journal demonstrates in a large animal model that heparinization is not a critical requirement in the setting of uncontrolled non-heart beating donors (NHBD). The avoidance of heparin would simplify the donation process and diminish ethical concerns related to interventions prior to family consent for donation in this specific category of donors [2, 3]. These results have also been corroborated by a recent clinical study by Erasmus et al. [4] using category III NHBD. However, in uncontrolled donation, previous studies using large animal lung transplantation models have demonstrated the importance of heparin administration within 30 min of cardiac arrest to avoid severe graft dysfunction [5, 6]. In the current report, both study groups appeared to have similar function during 1 h of ex vivo evaluation, however, organs were not transplanted, therefore the assurance of organ quality in both groups cannot be fully determined and more pre-clinical studies are necessary before safely moving this concept to the clinical arena. The importance of the ‘transplantation test’ becomes more evident in studies like this where microthrombosis and release of inflammatory mediators leading to endothelial injury might only become evident after exposure to immune cells from the recipient. Furthermore, in our experience, only 1 h of ex vivo assessment is insufficient time to determine the ultimate lung quality. We have shown that 3–4 h of stable lung functional parameters during ex vivo lung perfusion (EVLP) are required to achieve predictable post-transplant outcomes in humans [7].

While the routine use of EVLP in controlled NHBD lung transplantation is still somewhat controversial, we fully agree that EVLP should be mandatory in the setting of uncontrolled NHBD. To that end, the Spanish experience demonstrates a significant improvement in post-transplant outcomes, including a decreased incidence of primary graft dysfunction, after they adopted 4 h of EVLP testing (as opposed to a single pass donor blood assessment) as a standard practice for this type of donation [8].

Whereas the current research on avoidance of the use of heparin for NHBD lung donation seems appealing, the question of heparinization or not in uncontrolled NHBD might become a less-relevant topic in the near future when programmes for multi-organ donation from uncontrolled NHBD are established. Microvascular thrombosis seems to be a more significant problem for liver and kidneys in the setting of NHBD. In fact, many liver transplant programmes are now using fibrinolitics for controlled NHBD with the aim to improve their outcomes [9]. Current activities in the well-established Spanish and French programmes using uncontrolled NHBD include the initiation of venoarterial extracorporeal membrane oxygenation as soon as death is declared and obtaining legal permission in order to preserve abdominal organs [8]. In this case, the use of heparin seems to be mandatory.

Finally, we should not forget that only 15% of organs from brain death donors and 5–10% from controlled NHBD are currently utilized by transplant programmes in North America and Europe [10]. While research should continue with uncontrolled NHBD as a promising source of donation, we should continue to direct efforts towards optimizing utilization from the currently available donor pool. Both improvements in donor management and organ assessment, and ex vivo treatment of injured organs using EVLP as a platform aim to bring the utilization of donor lungs to at least 50% in the coming years.
partially contributing towards addressing the problem of organ shortage.

REFERENCES