

## APPENDIX

The period from death to the start of preservation maneuvering is a critical period that constitutes the main problem for obtaining organs from non-heart beating donors. The obtainment of such organs requires an immediate, 24 hours a day, 365 days a year response capability<sup>26</sup>.

The cardiac death donation protocol is activated from the call to the 061 Service that has assisted an out-hospital cardiorespiratory arrest. In Granada, this protocol is referred to as the "Alpha Code", and comprises a progressive cascade, activating health professionals that form part of a rapid response team. The scheme is as follows:

The 061 Service calls the Emergencies Coordinating Center, alerting to the possibility of a non-heart beating donor. The physician of the Coordinating Center calls the medical transplant coordinator, establishing a "three-way" conversation (emergency care physician – medical emergencies coordinator - medical transplant coordinator) to evaluate the information, compliance with the inclusion criteria, conditions, and estimated time of transfer to the hospital. If the medical transplant coordinator accepts the potential donor, the Alpha Code is activated. **FIGURE 1.**

The medical transplant coordinator immediately reports to the Traumatology Hospital of Hospital Universitario Virgen de las Nieves, and makes two calls: one to the nursing transplant coordinator and another to the intensivist on duty in the ICU of the Traumatology Hospital.

After receiving the call, the nursing transplant coordinator immediately reports to the Hospital and makes a number of calls: to the supervisor on duty,

the nurse of the transplant rapid response team, and the vascular surgeon. All of these professionals immediately report to the Hospital.

The supervisor on duty calls the Hospital porter on duty and the personnel of the User Information and Assistance Service.

The Hospital porter on duty calls Security and the Emergencies porter.

The rapid response team is composed of four professionals who report to the Hospital in under 30 minutes: two transplant coordinators, a nurse, and a vascular surgeon.

The transplant coordinators are two medical transplant coordinators (one of which is the sector coordinator) – both of which are intensivists ascribed to the ICU of Hospital Universitario Virgen de las Nieves - and two nursing transplant coordinators.

Six nurses of the rapid response team work in the ICU, Emergencies, Operating room and Neonatal Unit. As a point in common, all of them have at some point worked in Intensive Care.

Five vascular surgeons from both Hospital Clínico San Cecilio and Hospital Universitario Virgen de las Nieves participate as part of the vascular segment harvesting team.

In our protocol, the potential donor is immediately moved by the 061 Service to the ICU of the Traumatology Hospital. On one hand we avoid blocking the Emergencies critical care box of the Traumatology Hospital with the potential donor, and on the other hand the ICU of the Traumatology Hospital has two additional beds without specifically assigned health professionals, but which can be used in the case of an emergency. Since the personnel members

are located and report to assist the potential donor, the ICU of the Traumatology Hospital always allows us to have a bed available for the potential donor.

During admission to the ICU, with a mean time in 2011 of under 22 minutes, the following activities are carried out: evaluation of the potential donor; confirmation of cardiac death according to Spanish legislation (Royal Decree (RD) 2070/1999), with the absence of pulse and breathing for 5 minutes; right jugular or subclavian vein catheterization for sample collection; chest X-ray; nasogastric and bladder catheterization; and the sending of a fax requesting legal court authorization to start preservation maneuvering.

Once cardiac death has been certified, and the potential non-heart beating donor is definitively accepted, transfer to the operating room is carried out. The organ harvesting room is usually the Plastic Surgery operating room, between 15:00-08:00 hours, and holidays. If the Plastic Surgery operating room is occupied in the afternoon, we use the Maxillofacial Surgery operating room. In the case of donation in the morning on a working day, use is made of the Emergencies operating room. Lastly, if temporarily no operating room is available, preservation maneuvering is started in the ICU.

The screening criteria **TABLE 2** and time limits **FIGURE 2** must be strictly followed in order to guarantee the quality of the harvested organs.

The availability of a motivated in-hospital team trained in preservation maneuvering is crucial. Logically, we have had to dedicate time to training in new functions: automatic cardiac compressor, femoro-femoral bypass machines with hypothermia and membrane oxygenation, renal perfusion with preservation solution and hypothermia, etc. This has required effort to know how the systems

work, learn the techniques, and resolve problems with the use of the different systems.

In relation to the family interview, the protocol contemplates first assistance of the family by the User Information and Assistance Service in the Emergencies information or briefing room. Informing of death and providing psychological support for the family is carried out by the transplant coordinator in the information room, and when the coordinating team considers that the family is able to assimilate further information, the request for family consent to donation is made<sup>27</sup>.

**TABLE 2. SPECIFIC INCLUSION / EXCLUSION CRITERIA IN NON-HEART BEATING DONATION.**

Start of cardiac massage and mechanical ventilation (advanced life support measures) in under 15 minutes from the moment of cardiorespiratory arrest.

Age between 7 and 60 years.

Donors who die as a result of assault, and in which donation might interfere with the pertinent legal investigations, are excluded. In cases of doubt, telephone consultation of the forensic specialist on duty is made.

Absence of thoracic or abdominal injuries involving massive bleeding.

Normal external appearance (exclusion of homeless people, subjects with suspected risk practices, vein puncture marks, etc.).

Assistance time, including transfer (to ICU of the Traumatology Hospital), under 90 minutes.