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'In plain language': uniform criteria for organ donor recognition

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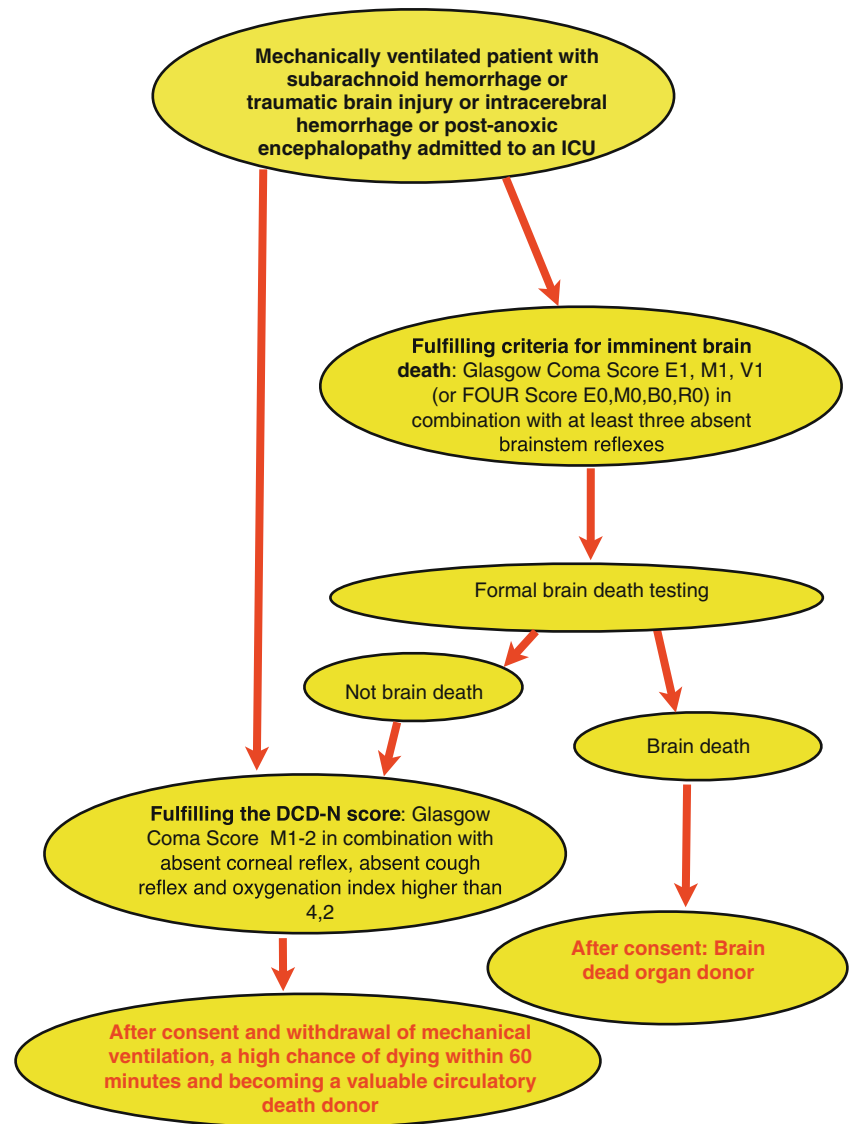
The brain dead patient is the ideal multiorgan donor. However, brain death is an undesirable outcome of neurocritical care and an artefact of nature resulting from the ability of medical technology to distort the dying process. One of the goals of neurocritical care is preventing brain death from occurring. Conditions leading to brain death are limited with subarachnoid hemorrhage (SAH), traumatic brain injury (TBI), and intracerebral hemorrhage (ICH) preceding brain death in over 80 % of the cases. Progress in prevention and treatment of these conditions has resulted in a sharp decline in the number of brain dead patients [1, 2]. For example, in the Netherlands, the number of donations after brain death declined by 30 % in the period 1995–2009 [3]. However, in the same period, donation after circulatory death increased by 282 %. This has great ramifications for the availability of

all organs, but especially for hearts, which, respecting the principle of the 'dead donor rule', can only be obtained from brain dead donors. As this decline is inescapable and desirable, seen from the perspectives of patients and society, the transplant community should anticipate this process by searching for alternatives and for better recognition and use of possible organ donors. Several initiatives have been undertaken to improve organ donation, such as the initiation of presumed consent legislation, improved attention to the request procedures, and improved awareness of ICU-physicians and ICU-nurses in the recognition and identification of possible organ donors.

In this issue of *Intensive Care Medicine*, Kutsogiannis and colleagues [4] report on the number of potential organ donors that are not referred to organ procurement organizations in Canada. They found that the donation of abdominal organs from brain dead donors could improve by between 3.3 and 7.6 per million population, and that the donation of abdominal organs from donors after circulatory death could improve from 3.9 to 6.5 and lung donation by between 2.7 and 4.3 per million population.

This is in line with earlier findings that early recognition of potential organ donors can lead to an increase in the absolute number of available donor organs. Patients with severe neurological damage are not always identified as potential donors. Other patients deteriorate before the declaration of formal brain death. Timely referral of potential organ donors to an organ procurement organization is essential. But early recognition is paramount. For this reason, several organ procurement organizations have developed recognition tools. For example, the Organ Procurement and Transplantation Network (OPTN) in the USA has developed the term 'imminent neurological death'. This definition is solely used for data submission and analysis, not for clinical use as an identification tool, and does not use the Glasgow Coma Scale (GCS) or FOUR score. For this reason, we have proposed a clinical

Fig. 1 Determination of possible brain dead organ donors and donors after circulatory death on the ICU. Based on De Groot et al. [5] and Yee et al. [8]



tool in the form of ‘imminent brain death’ (IBD) (Fig. 1) [5]. In a retrospective chart analysis, IBD proved to be the most practical tool to identify patients with a realistic chance to become brain dead, and therefore to identify patients most likely to become organ donors [6]. It is essential that all researchers use the same definition for potential organ donor recognition. Without this, comparison between countries and hospitals is impossible [7]. That the OPTN definition, which does not use the coma status of the patient, is not a very practical one is proved by the results by Kutsogiannis and colleagues that, out of the 114 patients with at least three absent brainstem reflexes, 74 had this irrespective of the GCS and 64 met the criteria of a GCS score of 3. All 114 patients would be included as potential brain dead donors in the OPTN definition, but only 64 in the IBD definition, resulting in different numbers and ‘potential’. Kutsogiannis and

colleagues included all patients with a GCS of 3, and three or more absent brain stem reflexes, for the recognition of possible brain dead donors, which is close to the IBD definition.

In patients not fulfilling criteria for IBD, donation of organs can take place after withdrawal of life-sustaining treatment and circulatory arrest. The quality of the organs is dependent on the time between the withdrawal of life support and death. Death beyond 2 h after withdrawal can result in the ineligibility of organs. For this reason, the recognition of potential circulatory death organ donors who will die in a short time after withdrawal of life support is of high interest for the transplantation community. A prediction model (DCD-N score) that has proved to be useful in retrospective and prospective analysis has been proposed by Yee et al. [8–10] (Fig. 1). Kutsogiannis and colleagues did not use such a prediction

model, but included all patients who did not meet the requirements for brain death and who were extubated prior to the determination of death. However, in retrospect, they analyzed univariable associations, coming close to the DCD-N score. Their findings of the absence of corneal and cough reflexes and motor response predicting death within 60 min of withdrawal of life support were consistent with the DCD-N score.

Besides the number of non-referred potential organ donors, the refusal rate contributes to the loss of potential donors: 14.2 per million population according to the study by Kutsogiannis et al. Although, Kutsogiannis and colleagues are aware of “collaborative requesting” not being the solution to increasing consent rates, the role of physicians seems crucial. Therefore, they suggest that more effort and experience must be gained by physicians in discussions of non-cognitive issues related to organ donation. This raises the question of whether physicians

have enough time to explore these issues with relatives. We recommend the appointment of ‘trained donation practitioners’ (TDP), who would guide families throughout the time in intensive care until a decision regarding donation has been reached [11]. The TDP will be present all the time to give information, answer questions, explore donation-related issues, and provide emotional support. This long-contact strategy was also suggested as a solution to higher consent rates by the authors of the ACRE study [12].

The study by Kutsogiannis and colleagues shows us that using uniform criteria for donor recognition produces reproducible data; these can then be used to compare countries and hospitals. Lessons can be learned from each other to increase the pool of potential organ donors.

Conflicts of interest None of the authors had potential conflicts of interest to report.

References

- Lovelock CE, Rinkel GJ, Rothwell PM (2010) Time trends in outcome of subarachnoid haemorrhage: population-based study and systematic review. *Neurology* 74:1494–1501
- Kopits E, Cropper M (2008) Why have traffic fatalities declined in industrialised countries? Implications for pedestrians and vehicle occupants. *J Transport Econ Pol* 41:129–154
- Kompanje EJO, De Groot YJ, Bakker J (2011) Is organ donation from brain dead organ donors reaching an inescapable and desirable nadir? *Transplantation* 91:1177–1180
- Kutsogiannis DJ, Asthana S, Singh G, Karvellas CJ (2013) The incidence of potential missed organ donors in intensive care units and emergency rooms: a retrospective cohort. *Intensive Care Med*. doi: [10.1007/s00134-013-2952-6](https://doi.org/10.1007/s00134-013-2952-6)
- De Groot YJ, Jansen NE, Bakker J, Kuiper MA, Aerdts S, Maas AIR, Wijdicks EFM, Van Leiden HA, Hoitsma AJ, Kremer HPH, Kompanje EJO (2010) Imminent brain death: point of departure for potential heart-beating organ donation. *Intensive Care Med* 36:1488–1494
- De Groot YJ, Wijdicks EFM, Van der Jagt M, Bakker J, Lingsma HF, IJzermans JNM, Kompanje EJO (2011) Donor conversion rates depend on the assessment tools used in the evaluation of potential organ donors. *Intensive Care Med* 37:665–670
- Jansen NE, De Groot YJ, Van Leiden HA, Haase-Kromwijk BJ, Kompanje EJO, Hoitsma AJ (2012) Imprecise definitions of starting points in retrospectively reviewing potential organ donors cause confusion: call for a reproducible method like ‘imminent brain death’. *Transpl Int* 25:830–837
- Yee AH, Rabinstein AA, Thapa P, Mandrekar J, Wijdicks EFM (2010) Factors influencing time of death after withdrawal of life support in neurocritical patients. *Neurology* 74:1380–1385
- De Groot YJ, Lingsma HF, Bakker J, Gommers DAMPJ, Steyerberg E, Kompanje EJO (2012) External validation of a prognostic model predicting time of death after withdrawal of life support in neurocritical patient. *Critical Care Med* 40:233–238
- Rabinstein AA, Yee AH, Mandrekar J, Fugate JE, De Groot YJ, Kompanje EJO, Shutter LA, Freeman WD, Rubin MA, Wijdicks EFM (2012) Prediction of potential for organ donation after cardiac death in patients in neurocritical state: a prospective observational study. *Lancet Neurol* 11:414–419
- Jansen NE, van Leiden HA, Haase-Kromwijk BJM, van der Meer JM, Kruijff EV, van der Lely N, van Zon H, Meinders AJ, Mosselman M, Hoitsma AJ (2011) Appointing ‘trained donation practitioners’ results in a higher family consent rate in the Netherlands; a multicenter study. *Transpl Int* 24:1189–1197
- The ACRE Trial Collaborators (2009) Effect of “collaborative requesting” on the consent rate for organ donation: randomised controlled trial (ACRE trial). *BMJ* 339:b3911