DANISH MEDICAL JOURNAL

Original Article

Dan Med J 2023;70(1):A09220572

Considerations of organ donation among prehospital physicians

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Dan Med J 2023;70(1):A09220572

ABSTRACT

INTRODUCTION. In Denmark, the organ donation rate has increased slightly in the past ten years. However, it remains impossible to match the growing need for transplantable organs. Procuring transplantable organs is therefore important. The prehospital physicians' perceptions of their potential role and involvement in the procurement of organ donors are scarcely, if at all, documented.

METHODS. An anonymous national online survey concerning prehospital physicians' opinions concerning prehospital treatment of potential organ donors was conducted among all prehospital physicians serving in prehospital mobile emergency care units in Denmark.

RESULTS. Among prehospital physicians, 71.8% had served in a mobile emergency care unit for more than five years; 42.3% had considered going from active treatment to organ-supportive treatment prehospitally. Only 2.4% considered that lacking knowledge regarding organ donation was a barrier to discussing organ donation prehospitally.

CONCLUSIONS. The majority of Danish prehospital physicians considered themselves sufficiently equipped to make professional decisions about organ donation. However, they also had a number of ethical reservations concerning prehospital positioning concerning organ donation.

FUNDING. none.

TRIAL REGISTRATION. not relevant.

Most developed countries experience a mismatch between organ donor supply and recipient demand. In Europe and Scandinavia, 16,000 patients are awaiting transplantations [1, 2]. In 2020,

8,369 organs were transplanted and 1,245 patients died while waiting for transplantation.

The Danish organ donation rate has increased slightly in the past ten years but still fails to match the growing need for transplantable organs [3].

In Denmark, a positive attitude exists concerning organ donation, both in the general population and among healthcare professionals [4, 5].

Potential organ donors are usually identified in the intensive care unit but may also be found in the emergency department and, occasionally, in general wards.

The prerequisite for being considered a potential organ donor is severe brain injury. The potential organ donor, therefore, per definition, needs to be intubated and connected to a ventilator. In this situation, the patient's condition may progress to brain death [6].

Only limited research exists elucidating the role of prehospital healthcare providers in the organ procurement process. This may have many explanations, one of which may be the dispersed organisational settings that are found prehospitally throughout Europe.

Current Danish legislation does not allow the prehospital physician to initiate the process that eventually leads to organ donation either by asking the family for consent to donation or in any way by ascertaining brain death. However, the prehospital physician is often the first physician to come into contact with patients suffering from fatal brain lesions. Thus, measures to ensure organ preservation may, theoretically, already be initiated prehospitally.

In Denmark, physicians may decide not to treat patients whose treatment is considered futile. Refraining from treating a patient with fatal lesions prehospitally may thus prevent this patient from being considered a candidate for organ donation. It follows that the prehospital physicians' mindset concerning organ donation may have great importance for the procurement of viable organs for transplantation.

Through an anonymous online survey targeting prehospital physicians working in mobile emergency care units (MECUs), we aimed to explore this mindset and prehospital physicians' positioning regarding organ donation.

METHODS

The five health regions of Denmark comprise a total of 25 MECUs [7].

The survey was performed as an anonymous online questionnaire. We created individual links for each of the five regions, and the links were distributed among the prehospital physicians by the local MECU leaders or secretaries.

We distributed the questionnaire in November 2020. An e-mail reminder was sent out after two and four weeks. We used the software programme SurveyXact (Rambøll Management Consulting, Aarhus, Denmark).

Non-parametric descriptive statistics were applied. The chi-squared significance test was used to examine relationships between categorical variables such as region, work experience and type of hospital.

Trial registration: not relevant.

RESULTS

In total, 248 of 367 prehospital physicians (67.6%) responded to the questionnaire. The response rate did not differ significantly between regions ($p = 0.90$). The distribution of professional experience and other demographic factors among the respondents is shown in **Table 1**.

TABLE 1 Questionnaire with contextual questions, translated from Danish language (N = 248).

Question Answer	n (%)
What do you primarily work with besides the MECU?	
Anaesthesiology	128 (51.6)
As an intensivist	41 (16.5)
Both	79 (31.9)
Do you work in a university hospital?	
Yes	145 (58.5)
No	103 (41.5)
How long have you worked in the MECU?	
< 1 yr	12 (4.8)
1-5 yrs	58 (23.4)
5-10 yrs	81 (32.7)
> 10 yrs	97 (39.1)
Are you a specialist in anaesthesiology?	
Yes	248 (100)
No	0
If you are a specialist in anaesthesiology: How many years have you been a specialist?[a]	
< 1 yr	7 (2.8)
1-5 yrs	58 (24.0)
5-10 yrs	80 (33.1)
> 10 yrs	97 (40.1)
I am not a specialist	0

MECU = mobile emergency care unit.
a) Only 242 of the 248 respondents answered this question.

The first question (**Table 2**) aimed to establish whether the physicians had previously touched upon the subject of organ donation in a prehospital setting: 45.2% confirmed and 54.8% declined.

TABLE 2 Questionnaire with organ-related questions, translated from Danish language (N = 248).

Question Answer	n (%)
1. Regarding organ donation, have you ever touched the subject of organ donation in the prehospital setting?	
Yes	112 (45.2)
No	136 (54.8)
2. Have you ever been in a prehospital situation in the MECU where you considered passing from treatment to organ supportive treatment?	
Yes	105 (42.3)
No	143 (57.7)
3. In your opinion, what are the biggest barrier(s) to touching on the subject of organ donation prehospitally?[a]	
Short patient and relative contact	142 (57.3)
Lack of follow-up to relatives	28 (11.3)
Lack of opportunity to have the exact diagnose prehospitally	183 (73.8)
Lack of knowledge regarding organ donation among the general population	6 (2.4)
Lack of knowledge regarding organ donation among physicians	14 (5.6)
No barriers	41 (16.5)
4. In Denmark, informed consent is required, and the citizen therefore actively needs to register as a donor. Presumed consent is that everyone > 18 years old automatically becomes a donor, unless she or she actively de-registers. Which principle do you think should applied in Denmark?	
Informed consent as the law currently prescribes	91 (36.7)
Presumed consent	153 (61.7)
None of the given options	4 (1.6)
5. Imagine that one of your family members suddenly has cardiac arrest. Cardiopulmonary resuscitation is attempted. You know the prognosis is poor. Would a direct question regarding organ donation from the emergency physician be inappropriate?	
Yes	127 (51.2)
No	74 (29.8)
Do not know	47 (19.0)
6. Continuation of question 5: Can you see yourself making such a request prehospitally?	
Yes	88 (35.5)
No	121 (48.8)
Do not know	39 (15.7)
7. You will get four scenarios. Please imagine that your consideration as an emergency physician in each of the four scenarios is that the case is futile. Mark for each scenario if you believe that the patient is to be transported to the nearest hospital to determine if organ donation is possible[a]	
52-year-old male with hypertension and atrial fibrillation. You find all signs of subarachnoid bleeding and early incarceration	238 (95.9)
63-year-old woman under assessment for malignant disease. You find all signs of subarachnoid bleeding and early incarceration	162 (65.3)
72-year-old man with diabetes and nephropathy. You find all signs of subarachnoid bleeding and early incarceration	164 (66.1)
87-year-old woman in a nursing home, dementia, found in her bed, now has all signs of subarachnoid bleeding and early incarceration	79 (31.9)

MECU = mobile emergency care unit.
a) You may select > 1 answer option.

In the second question, we asked physicians if they ever had considered the transition from active, patient-supportive treatment to organ-supportive treatment in a prehospital setting. A total of

42.3% confirmed this transformation, whereas 57.7% had never considered this issue. Physicians with more than ten years of experience as a specialist were more likely to consider a transition from patient treatment to organ-supportive treatment ($p = 0.02$). Furthermore, prehospital anaesthesiologists working in regional hospitals were less likely to transfer from active patient treatment to purely organ-supportive treatment ($p = 0.006$).

The third question aimed to explore what may make prehospital discussions about potential organ donation with next-of-kin challenging. More than one answer was allowed. 57.3%, answered "Short contact with patient and relatives", and 73.8% answered "Lack of opportunity to assign an exact diagnosis"; both reasons were indicated by 19.3% of the respondents. Only 2.4% of the prehospital anaesthesiologists reported that "Lack of knowledge of organ donation in the general population and among physicians" was a reason to refrain from discussions about organ donation in the prehospital setting.

The fourth question revealed that 38% of physicians endorsed the concept of informed consent, as presently designated by Danish law. The majority of respondents, 62%, preferred the concept of presumed consent.

Questions five and six presented the prehospital anaesthesiologists with a scenario in the prehospital setting. The scenario considered a patient in cardiac arrest whose prognosis was poor. In the first setting, the physicians were to imagine that he or she was next-of-kin, and the respondents were asked whether they would consider it appropriate if a fellow physician asked for their consent for organ donation. This question was deemed inappropriate by 51.6% of the respondents, whereas 29.8% found it appropriate; 18.6% were unable to answer the question.

In the second setting, the physician was asked if he or she would find it appropriate to ask the family for consent for organ donation in a similar case; 35.5% of the respondents considered it appropriate to ask and would do so themselves, whereas 49.2% found the question inappropriate and would not ask the relatives for consent for organ donation. Among respondents, 15.3% were unable to ascertain their position.

The final part of the questionnaire described four scenarios with patients of increasing age who were suffering from impending cerebral herniation following obvious intracerebral haemorrhage. Here, 54.4% of the physicians chose to transport the three youngest patients to a hospital, whereas 26.2% choose to transport all four patients to a hospital for further treatment and possible transplantation (see Table 2).

DISCUSSION

A discrepancy exists between the number of organ donors and the number of patients requiring transplantations [8]. Awareness campaigns and courses have sought to educate both healthcare professionals and the surrounding society.

Appropriate provision of compassionate care to next-of-kin was important to physicians as more than 55% regarded “Short contact with patient and relatives” a barrier to initiating discussions regarding organ donation. However, the primary obstacle to discussing potential organ donation with the family present at the prehospital scene appears to be the uncertainty as to the patient’s exact diagnosis. In an awake and cooperating patient, the accuracy of the prehospitally assigned diagnosis may reach levels up to 87% [9]. However, the prehospital physicians’ most essential tool apart from the clinical examination of the patient is the anamnesis provided by the patient. This requires an awake patient. The concern that the prehospitally assigned diagnosis may be inaccurate is appropriate, especially when considering a recent paper on 835 patients with coma of non-traumatic cause in the prehospital setting [10]. In these patients, who are unable to supplement the clinical examination through verbal clues regarding symptoms, the diagnostic accuracy was only 62% [10].

Remarkably, more than 60% of the responding physicians would prefer presumed consent over informed consent. This is interesting as the “informed consent” legislation has been in place since 1990 when the first law considering transplantation was passed in the Danish parliament.

In 2018, a citizen-driven proposal to enforce presumed consent in organ donation cases was submitted. However, the Danish parliament rejected the proposal by an overwhelming majority [11].

Several reasons may contribute to explaining the preference for presumed consent among the responding physicians; however, presumed consent legislation would potentially rule out some of the more delicate questions related to organ donation.

In our study, only one question considered donation after circulatory death (DCD), in the present context uncontrolled (i.e. unplanned) donation after circulatory death (uDCD) [12]. In Denmark, neither controlled (i.e. planned) donation after circulatory death (cDCD) [12] nor uDCD are currently in place. The Danish healthcare authorities have initiated a process aiming to implement DCD. The legislation allowing DCD was passed in April 2019, but due to the COVID-19 pandemic, implementation of the legal act has yet to be effected. Use DCD is expected to increase the number of donors. In Sweden, a ten-year evaluation of out-of-hospital cardiac arrest showed that by implementing uDCD, the pool of organ donors could be increased by 15 to 75 potential donors [13].

We found that half of the prehospital physicians considered inappropriate both having to ask for consent to organ donation following cardiac arrest (uDCD) as a prehospital care provider and being asked for consent to organ donation following uDCD as a family member. These findings correspond with the findings reported in a Dutch study [14], where the potential for utilising uDCD was hampered due to prehospital protocols determining when to initiate and terminate resuscitation.

In the final question in our study, nearly all physicians would transfer a 52-year-old man with

hypertension and atrial fibrillation to the hospital. However, only one-third considered transporting an 87-year-old woman with dementia and living in a nursing home to the hospital. These answers imply that two-thirds of the prehospital anaesthesiologists would terminate the treatment of the 87-year-old woman, thus forgoing any possibility of her entering into a transplantation process.

One reason for this difference may be that the prehospital physicians themselves do not consider an 87-year-old woman a potential donor candidate. However, in Denmark, patients up to the age of 92 years have donated kidneys [15]. Another potential explanation is related to the Hippocratic Oath [16]. Above the obvious obligation to save lives and to relieve the patient's suffering, the primary principle of the Hippocratic Oath is the principle of non–maleficence, or, to do no harm. These thoughts are not limited to the Danish prehospital system. A qualitative study among intensivist and prehospital physicians in Australia [17] showed that the main obstacle to donation was considerations concerning end-of-life care.

In light of our findings, organ donation and cardiac arrest or cardiac death may be regarded as opposing events. This is further emphasised by the fact that international guidelines or regulations are in place to ensure that the treatment of patients with cardiac arrest will be terminated if deemed futile. These guidelines come with different names, including the Termination of Resuscitation guidelines, the European Resuscitation Council termination guidelines or local legal guidelines [18-20]. Additionally, the patient might have issued advance directives specifying restrictions regarding the level of treatment. These latter considerations that reflect the patient’s autonomy may potentially further cloud the decision-making. Should legislation regarding organ donation with presumed consent be introduced, legal measures must be taken to establish the priorities: The patient at hand or the potential future recipient of an organ.

We believe that this is the crucial embodiment of the intersection between the Hippocratic Oath and the transplantation of vital organs: Caring for the patient and ensuring that no harm is done while at the same time meeting future patients’ needs. The patients who may, in the future, receive the organs are not personally cared for by the prehospital physician at the moment, and therefore the relation that the Hippocratic Oath describes has not yet been established. This potential conflict of interest should be further addressed by the Danish health authorities as the potential conflict may reduce the element of altruism that organ donation in essence represents.

Strengths and limitations

This was a nationwide study covering all anaesthesiologist-manned prehospital MECUs. Owing to the high response rate achieved, we believe that the results reported in essence represent the prehospital physicians’ opinions and mindsets. Furthermore, the respondents were anonymous and all ethical perceptions were validated.

The study was limited by being a questionnaire survey. The respondents were restricted to

answering only the questions presented to them in the questionnaire. Furthermore, “organ donation” was addressed as a general concept without distinguishing between organ donation after brain death and DCD. Any discrepancies in the respondents´ perception of the concept of organ donation in these two cases could not have been exposed.

CONCLUSIONS

This study has shown that the majority of Danish prehospital anaesthesiologists consider themselves sufficiently equipped to make both professional decisions regarding organ donation and to consider personal requests regarding organ donation. However, it seems that Danish prehospital physicians are not yet ready to embrace the concept of organ donation in patients after circulatory death.

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Accepted 29 November 2022

Conflicts of interest none. Disclosure forms provided by the authors are available with the article at ugeskriftet.dk/dmj

Cite this as Dan Med J 2023;70(x):A09220572

REFERENCES

1. Eurotransplant. Fact sheet. www.eurotransplant.org/wp-content/uploads/2021/01/Factsheet_2020.pdf (11 Aug 2022).
2. Scandiatransplant. Welcome to Scandiatransplant. www.scandiatransplant.org/ (11 Aug 2022).
3. Danish Centre for Organ Donation. [Danish Centre for Organ Donation] (In Danish). www.organdonation.dk/tal/tal-europa/ (11 Aug 2022).
4. Sørensen P, Kousgaard SJ. Barriers toward organ donation in a Danish university hospital. Acta Anaesthesiol Scand. 2017;61(3):322-7.
5. Danish Health Authority. [Attitudes towards organ tranplantation] (In Danish). www.sst.dk/da/Viden/Sundhedsvaesen/Organdonation/Danskernes-holdning-til-organdonation (11 Aug 2022).
6. A definition of irreversible coma. Report of the Ad Hoc Committee of the Harvard Medical School to Examine the Definition of Brain Death. JAMA. 1968;205(6):337-40.
7. Mikkelsen S, Lassen AT. The Danish prehospital system. Eur J Emerg Med. 2020;27(6):394-5.
8. Dhital KK, Chew HC, Macdonald PS. Donation after circulatory death heart transplantation. Curr Opin Organ Transplant. 2017;22(3):189-97.
9. Hansen LH, Mikkelsen S. Ischaemic heart disease: accuracy of the prehospital diagnosis-a retrospective study. Emerg Med Int. 2013;2013:754269.
10. Lutz M, Möckel M, Lindner T et al. The accuracy of initial diagnoses in coma: an observational study in 835

patients with non-traumatic disorder of consciousness. Scand J Trauma Resusc Emerg Med. 2021;29(1):15.

11. [Proposal for presumed consent legislation, The Danish Parliament] (In Danish). www.ft.dk/samling/20181/beslutningsforslag/b10/index.htm (11 Aug 2022).
12. Thuong M, Ruiz A, Evrard P et al. New classification of donation after circulatory death donors definitions and terminology. Transpl Int. 2016;29(7):749-59.
13. Af Geijerstam P, Forsberg S, Claesson A et al. Potential organ donors after Out-of-Hospital Cardiac Arrest during a ten-year period in Stockholm, Sweden. Resuscitation. 2019;137:215-20.
14. Venema LH, Brat A, Nijkamp DM et al. Factors that complicated the implementation of a program of donation after unexpected circulatory death of lungs and kidneys. Lessons learned from a regional trial in the Netherlands. Transplantation. 2019; 103(9):e256-e262.
15. Danish Centre for Organ Donation. [A description of donors] (In Danish). www.organdonor.dk/tal-og-undersogelser/organdonorer (11 Aug 2022).
16. Hippocrates of Cos. The Oath. (1923). Loeb Classical Library. 147:300-301. Harvard University Press, 2018. www.loebclassics.com/view/hippocrates_cos-oath/1923/pb_LCL147.301.xml (11 Aug 2022).
17. Macvean E, Yuen EY, Tooley G et al. Attitudes of intensive care and emergency physicians in Australia with regard to the organ donation process: a qualitative analysis. J Health Psychol. 2020;25(10-11):1601-11.
18. Mentzelopoulos SP, Couper K, Van de Voorde P et al. European Resuscitation Council Guidelines 2021: Ethics of resuscitation and end of life decisions. Resuscitation. 2021;161:408-32.
19. Morrison LJ, Visentin LM, Kiss A et al. Validation of a rule for termination of resuscitation in out-of-hospital cardiac arrest. N Engl J Med. 2006;355(5):478-87.
20. Morrison LJ, Verbeek PR, Vermeulen MJ et al. Derivation and evaluation of a termination of resuscitation clinical prediction rule for advanced life support providers. Resuscitation. 2007;74(2):266-75.