



Importance of Continuing Education for Medical Staff to Improve the Confirmation Rate of Intent for Organ Donation

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ABSTRACT

Background. Among Organisation for Economic Co-operation and Development countries, the number of cadaveric donors per population is the lowest in Japan. The present study investigated whether a continuing educational intervention for medical staff, such as Donor Action Program (DAP) that is aimed at increasing the number of cadaveric donors, improved the confirmation rate of organ donation in potential donors.

Material and Methods. We studied 2 hospitals with emergency centers in Toyama, Japan. DAP was conducted 2 to 3 times each year. We extracted mortality cases recorded in the emergency care departments of each hospital for over 10 years between 2007, prior to DAP's implementation, and 2017 to examine the confirmation rate of the intent of the families of potential donors for organ donation and the timing and methods for confirming intent to donate in cases that resulted in organ donation.

Results. The confirmation rate increased after the introduction of DAP and remained high (over 80%) in both hospitals after 2012. Regarding actual organ donation, some patients were asked by staff about their intent when they became potential donors in addition to the hospitalization intake form; it was offered by family members of some of the patients.

Conclusion. Regular educational training on organ donation improved the confirmation rate of potential organ donors' donation intention. For organ donation, medical practitioners must take the appropriate steps to confirm the patient's intent to donate when he/she is determined as a potential donor.

A KIDNEY transplant in 1956 was the first human-to-human organ transplant performed in Japan [1,2]. Legislation on organ donation started to be introduced after the initial transplant. A law on corneal and kidney transplantation from patients of cardiac arrest was implemented in 1980, and the Organ Transplant Law was subsequently implemented in 1997, paving the way for organ donation from brain dead patients in Japan. In the Organ Transplant Law, an expression of intent to donate organs by the donor in writing and consent from the family members are required for organ donation from brain death patients. Those under the age of 15 years were unable to donate organs when brain dead, owing to problems surrounding the

validity of documents [3]. The Organ Transplant Law was amended in 2010 following the revision of the Declaration of Istanbul in 2008 [4] and WHO's guiding principles on transplantation in 2010 [5]. Organ donation from brain dead patients, even if the intent of the donor was unknown or the donor was a child, was allowed—as long as the family members consented [6]. However, even after the law was

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amended, the number of cadaveric donors in Japan has not increased significantly; the number of donors per 1 million people remains low at 0.88 compared with the Organisation for Economic Co-operation and Development average of 17.9 [7,8].

One of the possible reasons the number of organ donations has shown no change after changes were made to the legal system is that information on organ donation is not provided in an appropriate manner to the family members of potential donors who are medically able to donate organs. Therefore, in the present study, we developed an education program and framework that could ensure the provision of information necessary for organ donation to those who need it, with the purpose of investigating their effects.

MATERIALS AND METHODS

We investigated the emergency units, intensive care units, and neurosurgical departments of 2 hospitals (the overview of each hospital is shown in Table 1) with critical care centers that cover 2 medical areas with a total population of approximately 830,000 in Toyama. In 2007, we started educating the staff of targeted hospital wards on organ donation and developing a framework using the methods of the Donor Action Program (DAP) [9,10]. We investigated and examined the circumstances surrounding organ donation by hospitalized patients staying in each unit of each hospital over a period of 10 years up to 2017.

When conducting the study, we provided a three-part educational program through DAP to the participants. Prior to this, we explained the content of the study to persons in the relevant units of each hospital and discussed how it would be implemented after providing an outline of the survey to the directors of each hospital and then obtaining their consent. The 3 parts of DAP were as follows: 1. understanding of the organ donation indication criteria, 2. understanding the flow of organ donation, and 3. necessity and understanding of option presentation. A 30-minute lecture was given for each part, followed by a combination of exercises for learning the indications and exclusion criteria for organ donation. In this latter part, mock cases were presented and exercises were given for learning the procedures of organ donation by sorting cards with different scenarios from organ donation. We offered the same program 2 to 3 times each year so that all relevant staff of each hospital could enroll.

Meanwhile, we conducted a survey with items on how each hospital confirmed the intent of potential donors to donate organs, the confirmation rate, and the actual number of organ donors. We compiled the data by year and then compared them.

Patients aged 70 years old or younger who were thought to be brain dead were considered potential donors. Based on the donor

indication criteria [11] proposed by the Japan Organ Transplant Network, patients with systemic active infection, human immunodeficiency virus antibodies, HTLV-1 antibodies, hepatitis B virus antigen, Creutzfeldt-Jakob disease and suspected Creutzfeldt-Jakob disease, and malignant tumors (except for primary brain tumors and those that have been cured) were excluded. Patients who died within 12 hours of being diagnosed as brain dead were excluded when compiling data; it is difficult to harvest organs given the time required for the actual procedures for confirming intent to donate organs and the organ donation process.

The present study was approved by the Ethics Review Committee of the University of Toyama [Clinical 30-135] and was carried out in accordance with the Declaration of Helsinki. Surveys at each hospital were conducted using anonymized information that did not include personal information, such as names and dates of birth.

RESULTS

The number of potential donors at both hospitals varied by year. The maximum was 15, and the minimum was 3 at Hospital A, whereas the maximum was 17 and the minimum was 4 at Hospital B. Of the potential donors whose intent regarding organ donation was confirmed, 55 out of 70 (79%) were not willing to donate organs at Hospital A, whereas 94 out of 99 (95%) were not willing to do so at Hospital B (Table 2).

At both Hospitals A and B, methods of confirming with potential donors their intent regarding organ donation included, in descending order, confirmation in writing only at the time of hospitalization, oral confirmation of intent in addition to the intake form completed at the time of hospitalization, and the family's offer in addition to the intake form completed at the time of hospitalization. There were no differences in the confirmation methods between the hospitals (Table 3).

The confirmation rate of patients' intent regarding organ donation, which was less than 50% at the time, increased as a result of introducing DAP. The intent confirmation rate ranged between 80% and 100% between 2012 and 2017 at both hospitals (Fig 1).

The number of organ donations made during the study period at both hospitals was 8 (Table 4). In 4 (50%) of the actual organ donation cases, the method of confirming intent was oral confirmation, whereas in the other 4 (50%) cases, it was the families' offers; none of them were confirmed by the intake form only at the time of hospitalization.

DISCUSSION

The present examined whether DAP, a form of continuing educational intervention, improved the confirmation rate of potential donors' intent for organ donation at hospitals. The results showed that it was effective: the confirmation rate of intent regarding organ donation at the targeted hospitals increased up to 80% or more in only 2 years from the start of DAP intervention. We believe this outcome is a result of the establishment of a mechanism for understanding the actual circumstances that hospital patients requiring

Table 1. Overview of Targeted Hospitals

	Hospital A	Hospital B
Number of beds	733	533
Number of patients brought in by ambulance (persons/year)	5390	3500
Number of deaths in emergency unit (persons)	250	207
Population of medical area (persons)	507,770	325,431

Table 2. Methods of Confirming Potential Organ Donors' Intent and Their Percentage at Hospitals A and B Between 2007 and 2017

	Hospital A	Hospital B	Total	(%)
Intake form at the time of hospitalization	51	78	129	(76.3)
Intake form at the time of hospitalization + oral confirmation	18	18	36	(21.3)
Intake form at the time of hospitalization + family's offer	1	3	47	(2.4)
Total	70	99	169	

emergency care are in and for reflecting improvements according to the consensus regarding organ donation shared within the entire hospitals, itself a result of increased awareness of many staff members after enrolling in DAP.

We examined the methods used to confirm the organ donation intention of potential donors who actually donated organs. The results suggested that the timing was important in terms of confirming intent regarding organ donation. At the 2 hospitals examined, intent regarding organ donation was confirmed in advance using the intake form completed at the time of hospitalization in over 75% of the cases. However, when we examined actual organ donation cases, we found that confirmation using the intake form only at the time of hospitalization did not lead to organ donation, whereas oral confirmation by staff at the time of being determined as a potential donor and families' offers led to organ donation. The consent rate when intent regarding organ donation was orally confirmed was 11.1%. This is similar to the consent rates reported by Natori et al [12,13] when intent was confirmed in writing using brochures at the time of being determined as a potential donor. When a patient becomes a potential donor, it is important that the medical staff properly provides information to the family members of the patient in a way the staff feels comfortable, either in writing or orally. To this end, DAP is effective in educating medical staff so that they understand the definition of a potential donor and are able to recognize the opportunity for organ donation at an early stage. The intake form used at the time of hospitalization is considered to play

the role of a reference that medical staff can refer to when a patient becomes a potential donor.

Meanwhile, in the present study, family members were likely to propose organ donation in cases where the patient was in possession of an organ donor card. This suggests that family members were prompted to propose donation as a result of being reminded, at the time of filling in the admission intake form, of the fact that organ donation had been discussed among family members.

The reason that the confirmation rate of intent regarding organ donation increased as a result of introducing DAP and that it was maintained afterward is the continuous offering of educational programs. A previous study reported that education of senior members, recognition as a donor, and an option presentation by trained staff at an early stage, as well as education of intensive care unit staff for donor management, are important for increasing the number of organ donors [14]. Although the lectures and exercises we are giving in DAP are brief, they have helped medical staff to identify potential donors and present options for organ donation.

Psychological resistance appeared to remain among staff regarding an option presentation for organ donation. The reasons for this may be anxiety regarding the generation of complicated grief as a result of a failed approach to the family members [15]. There is also the problem of changing the awareness of the intensive care unit staff involved in treatment for saving lives [16]. Therefore, in DAP, medical staff should not only be educated on the knowledge and procedures of organ donation as part of medical staff education but should also be reminded that organ donation is one of the patients' rights. Organ donation is a form of medical care that is provided to patients in emergency settings, and it is no different from general treatments with regard to the process of confirming the patient's intent regarding them, which may include confirming whether to continue or reduce treatment and confirming the Do Not Resuscitate Order. The World Medical Association's Ethics Manual [17] stated that as part of the process of informed consent, "Patients have the right to obtain the information needed to make their own decisions." With regard to decision-making by patients who lack the capacity for sound judgment, "informed consent must be obtained, whenever possible, from a legally entitled representative." The criteria for decision making by incompetent patients include their

Table 3. Number of Potential Donors, Number of Potential Donors Whose Intent Was Confirmed, and Their Proportion at Hospitals A and B Between 2007 and 2017

Hospital	Confirmation of Potential Donors' Intent	Year											Total	(%)
		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017		
A	No intent	3	4	4	9	3	8	3	7	6	5	3	55	(0.79)
	Unknown intent	0	0	4	1	1	2	1	0	2	2	0	13	(0.19)
	With donor card	0	0	0	1	0	1	0	0	0	0	0	0	(0.03)
B	No intent	5	4	6	10	3	11	8	7	13	15	12	94	(0.95)
	Unknown intent	0	0	1	0	0	0	0	0	0	1	1	3	(0.03)
	With donor card	0	1	0	0	0	0	0	0	0	0	1	2	(0.02)

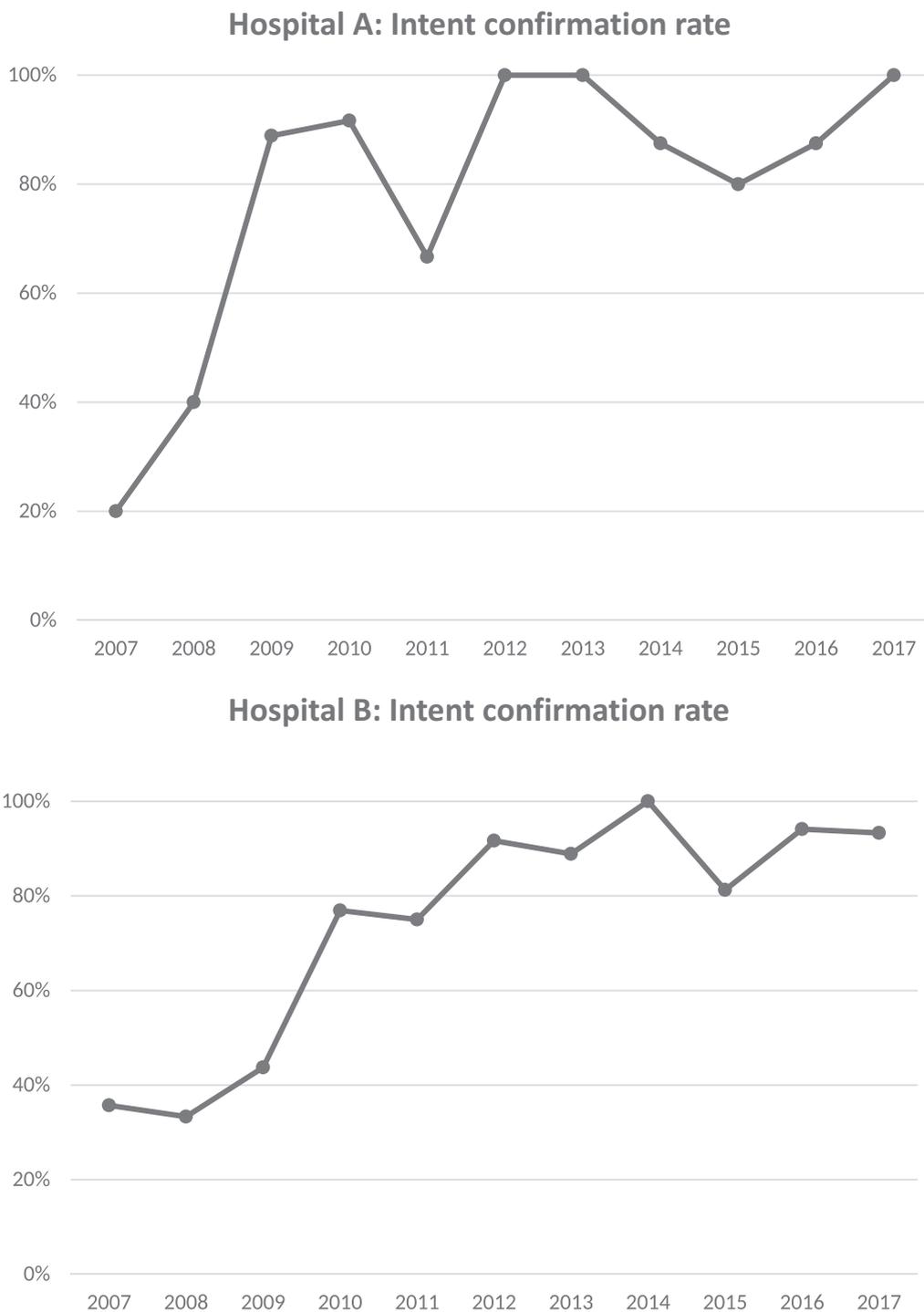


Fig 1. Transition of the confirmation rate of the potential donors' intent regarding organ donation at Hospitals A and B between 2007 and 2017.

preferences, if these can be expressed by them; advance directives; substituted judgment (ie, decisions made by the designated substitute decision maker); and best interests (ie, when an incompetent patient's preferences are not known,

treatment decisions should be based on the patient's best interests). Based on these principles, we checked with the patient or his/her family members as substitute decision makers as to whether they wish to donate organs at an early

Table 4. Details of the Donors at Hospitals A and B Between 2007 and 2017

Organ Donation Record			Department in Charge	Duration of Hospitalization	Method of Confirming Intent	Hospital	Notes
Age Range	Sex	Disease					
40	M	Pulmonary embolism	Cardiac surgery	10 days	Oral	A	
50	F	Resuscitation from CPA	Renal medicine	15 days	Oral	A	
30	M	Hypoxic encephalopathy due to asphyxiation	Anesthesiology	2 days	Oral	A	
50	F	SAH	Brain surgery	6 days	Family's offer	A	
50	M	AMI/SAH	Cardiovascular	5 days	Oral	A	
60	M	Cardiac arrest/post-resuscitation encephalopathy after CPA	Anesthesiology	21 days	Family's offer	B	With donor card
50	M	Cardiac arrest/hypoxic encephalopathy	Anesthesiology	2 days	Family's offer	B	
30	M	Hypoxic encephalopathy	Anesthesiology	5 days	Family's offer	B	With donor card

stage, when organ donation is possible, if the patient is considered to be a potential donor. These efforts in continuing education for medical staff are a major factor in maintaining a high intent confirmation rate.

The burden and risk to the hospitals [18] have been pointed out as an issue when actually increasing the number of organ donations. Moreover, there are various challenges faced by Japan's organ transplant system, which fails to provide adequate support in actual medical settings [19,20]. What is required is a structure that allows the instant acquisition of information required in the field from websites specializing in transplantation medicine, such as the Organ Donation Toolbox [21] made available in the United States, to the development of a framework that provides human support required in the field and ensures the confirmation of intent regarding organ donation.

In the present study, there were fluctuations in the number of potential donors per year. Fluctuation was particularly large at Hospital A. This is believed to be due to the fact that, in the medical area to which Hospital A belongs, emergency hospitals follow a rotating schedule. There are 4 other emergency hospitals that deal with neurosurgical diseases, and they take turns accepting emergency patients. Thus, patients who are potential donors tend to be dispersed. The intervention method involving DAP used in the present study can be applied to other emergency medicine hospitals. Indeed, we plan to implement it at other medical institutions to increase the number of organ donations across the region.

CONCLUSION

The confirmation rate of the potential donors' intention regarding organ donation increased as a result of developing a framework for introducing education to medical institutions in organ donation through DAP and then continuously providing it. It is important for the intent regarding organ donation to be confirmed in advance using the intake form at the time of hospitalization. Further, it is crucial that medical professionals provide information appropriately in accordance with the principles of informed

consent when the patient is determined as a potential donor to confirm their intent regarding organ donation. Going forward, the introduction of DAP to even more hospitals as well as services for reducing burden in clinical settings at the time of organ donation are required.

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