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Interpretations and views of hospital specialists and residents on the decision-making process, documentation, and education of the Do Not Attempt Resuscitation (DNAR) order

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Abstract

A Do Not Attempt Resuscitation (DNAR) order is one of the most important medical decisions in providing adequate end-of-life care. Physicians in general perceive challenges in decision-making and in interpreting DNAR orders.

Our objectives were to explore hospital specialists' and residents' opinions and perceptions of the DNAR order-making process and training related to DNAR order-making.

A link to the web-based multiple-choice questionnaire was sent by e-mail to all physicians working in the special responsibility area of the Tampere University Hospital. The questionnaire covered several issues related to DNAR orders, including their meaning and documentation. Participants responded anonymously. Residents' responses were compared with those of specialists.

219 physicians covering all specialties responded. A total of 155 (71%) were specialists and 64 (29%) were residents. Challenges in DNAR order-making, documentation, and interpretation were more common among residents (60%) than among specialists (34%) ($p < 0.001$). Training in DNAR order-making was considered adequate by 40% (n=25) of the residents, compared with 61% (n=94) of the specialists (p=0.007).

Structured education on DNAR protocols and end-of-life decision-making should be incorporated into all clinical specialty training programs. Integration of artificial intelligence (AI)-based decision-support tools into electronic health record (EHR) systems may further enhance consistency and accuracy in the DNAR process.

Keywords: do not resuscitate order, end of life care, physicians, opinions, electronic health records

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Introduction

A "Do Not Attempt Resuscitation" (DNAR) order means a process for deciding to withhold cardiopulmonary resuscitation (CPR) [1]. DNAR order making and its implementation are complex processes.[2,3]. According to the guidelines of the European Resuscitation Council, CPR should be withheld when there is an apparent mortal injury or there is convincing evidence that CPR would not be consistent with the patient's values and preferences, or in their best interests [4]. According to the Finnish legislation, all care-related decisions, such as DNAR order-making, should be discussed with the patient or, if the patient is incompetent, with relatives [5]. Reportedly, most seriously ill patients do not want a resuscitation attempt [6]. National legislation, however, gives no specific guidance for making a DNAR order [5,7]. The National Supervisory Authority for Welfare and Health states that the DNAR order is a medical decision made by the physician responsible for the patient's care. [8]. However, recommendations for discussing DNAR orders and medical futility in practice through shared decision-making are needed [2,9,10].

In other Nordic countries, the DNAR order is usually issued by a senior doctor or an attending physician [11-13]. Previous studies have reported that residents find CPR/DNAR decision-making alone difficult [14,15] and that only specialists should make these decisions [16,17]. Becerra et al. found that residents often consult other medical staff regarding DNAR orders [18]. Still, they have difficulty communicating with other health care professionals (HCPs) about the care of patients with a DNAR order [16,19]. Residents also feel they are not adequately supported in ethical and legal issues [20]. Overall, HCPs commonly lack support for DNAR order-making [21] and are unaware of the guidelines [22].

Reportedly, HCPs perceive challenges in understanding the DNAR process and policies [10,23]. The meaning of a DNAR order can be misinterpreted [24-27]. Improper documentation of DNAR orders, as well as patients' self-completed advance directives that are not visible in risk information, can lead to communication breakdowns, uncertainty in clinical decision-making, potential errors in patient care, and compromised patient safety [26,27]. Thus, there is a need for clear, standardized documentation practices in clinical settings [28]. Delays in documentation and poor communication of DNAR orders among HCPs are common [22,29]. The specialty and level of experience of the doctor may affect the frequency and timing of DNAR orders [30], and junior doctors may have a limited understanding of the meaning of a DNAR order [15-22]. An overall shortage of education and knowledge about when to issue a DNAR order has also been identified [15,24,31]. Training programs on DNAR order-making should incorporate awareness of guidelines, practical documentation skills, and communication strategies to ensure clarity and consistency [31-33]. This includes education on properly documenting DNAR orders and communicating effectively with patients and families about end-of-life care preferences [34]. Emerging technologies, such as Artificial Intelligence (AI)-based decision support tools integrated into EHRs, offer promising strategies to improve DNAR decision-making, especially in reviewing and updating documentation [35]. AI systems can help reduce variability in documentation and ensure that DNAR orders are clearly recorded and communicated across multidisciplinary teams. However, AI implementation requires careful attention to transparency, usability, and ethical considerations to maintain trust and support shared decision-making. [35-39].

DNAR orders in hospitalized patients are most frequently issued in the departments of critical care

medicine, general surgery, gastroenterology, pulmonology, and hematology [37]. Only a few studies have addressed the differences and/or discrepancies in DNAR order-making and interpretation across clinical specialties [17,22,23]. This study aimed to explore physicians' perceptions of decision-making, documentation, timing, and education regarding the DNAR order process across clinical specialties in a hospital setting.

Study methods

The authors developed a structured questionnaire based on themes from previous literature on the interpretation, timing, and documentation of DNAR orders. Perceptions regarding recommendations for national guidelines on DNAR order-making and its documentation were also considered [5, 8]. The survey included nine multiple-choice questions on various aspects of the DNAR order process, with the option to provide open comments after each question. Approval for the study was obtained from the participating hospitals. An invitation to participate in the study and a link to the web-based, multiple-choice questionnaire (Webropol) were sent via email to all nurses and physicians working in the Tampere University Hospital's collaborative area for healthcare and social welfare, which includes the Pirkanmaa, Southern Ostrobothnia, and Kanta-Häme wellbeing areas. The catchment area of the study hospitals is ca. 915,000 inhabitants, representing ca.16% of Finland's population. A cover letter described the study's purposes and methods and stated that participation was voluntary and anonymous. The participants were told that the data would be reported at the specialty area level, but not by specific departments, units, or participating hospitals. Respondents agreed to participate by answering the questionnaire. Access to the questionnaire was available for eight weeks. Participants responded anonymously. The study was conducted in compliance with the National Act on Medical Research [7] and guidelines in nonmedical research [5].

For this study, the specialties were categorized as: 1. Anesthesiology/intensive care unit (ICU); 2. Conservative departments (including internal medicine and related specialties such as cardiology, infectious diseases, etc., acute care/emergency room, and neurology); 3. Surgical departments (surgery, neurosurgery, gynecology, ophthalmology, and otorhinolaryngology); 4. Oncology; 5. Pediatrics and pediatric neurology; and 6. Psychiatry. Descriptive statistics were summarized with frequencies and percentages. Chi-square or Fisher’s exact test was used to examine the associations between the specialties and the various aspects of the DNAR order process. A p-value of <0.05 was used as a threshold for significance. All analyses were conducted with BM SPSS Statistics, version 29.0.

Results

In total, 934 HCPs responded, of which 219 (23%) were physicians covering all specialties. Among physicians, 155 (71%) were specialists and 64 (29%) were residents. Conservative departments (n=80), anesthesiology/ICU (n=56), and operative departments (n=52) formed the largest groups. One specialist didn`t report the department.

When asked whether making a DNAR order was challenging, the lowest proportions were observed in oncology (25%) and anesthesiology/ICU (31%). In the other specialties, 43-54% of respondents reported experiencing challenges and difficulties (Figure 1). However, there was no statistical difference between specialties (p=0.354).

Difficulties were more common among residents (60%) than among specialists (34%) ($p < 0.001$). Also, regarding who should be responsible for a

DNAR order, specialists' and residents' views differed statistically significantly ($p < 0.001$). Overall, 57% of the specialists supported the view that the decision should be made by a senior doctor, taking into account the patient's and/or relatives' opinions, whereas 30% of the residents held the same view. Among residents, 44% believed a resident could issue a DNAR order alone, but only 7% of specialists did. There was also a statistically significant variation in opinions on who can be responsible for a DNAR order making between different specialties ($p<0.001$) (Figure 2).

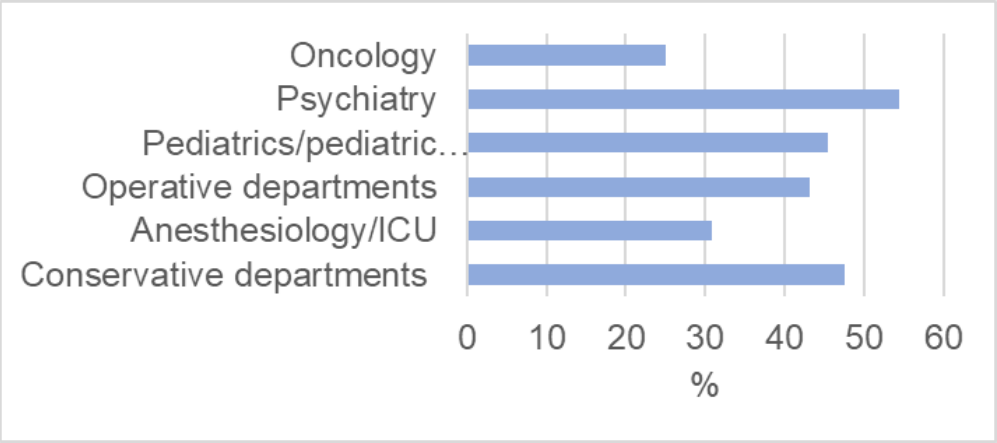

Figure 1. The percentages of doctors (n=218) representing different specialties who considered that there are difficulties and/or challenges in making a do not attempt resuscitation (DNAR) order.

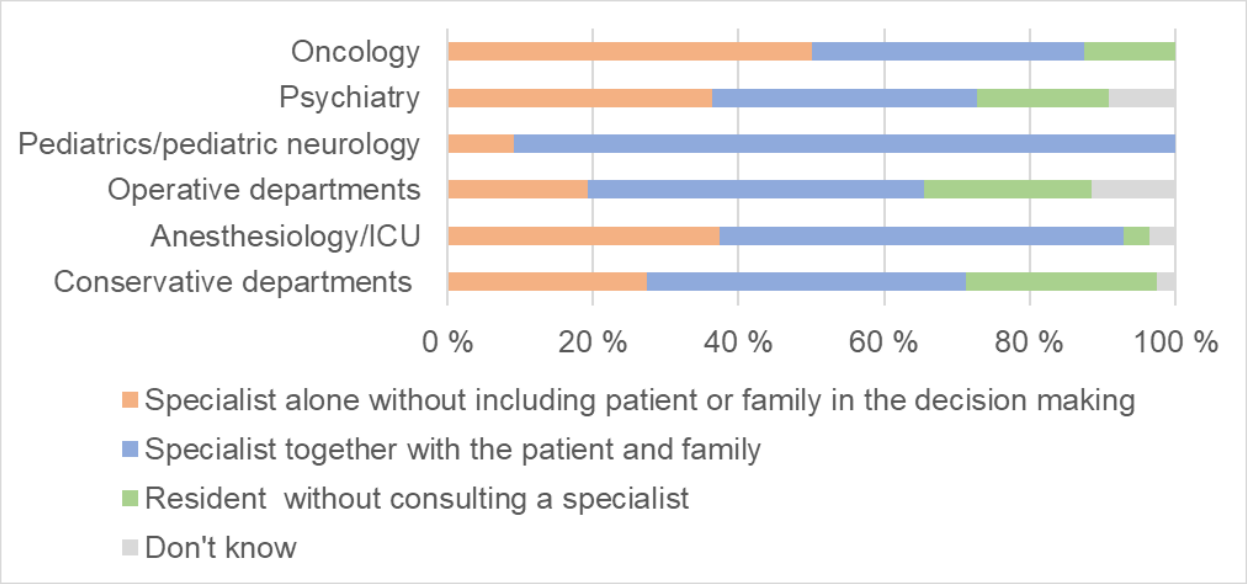

Figure 2. Opinions of doctors (n=218) representing psychiatry, operative or conservative departments on a statement "Who can be responsible for making a do not attempt resuscitation (DNAR) order."

The questions on physicians' opinions regarding the interpretation of a DNAR order offered multiple-choice responses. There was some variation between different specialties in the statement that a DNAR order excludes CPR only. Opinions on whether a DNAR order also excludes treatment in the ICU, intravenous treatments, administration of antimicrobial medications, and all electronic diagnostic procedures showed statistically significant specialty-related variation (Table 1). Residents supported the statement that a DNAR order excludes ICU treatment less frequently (36%) than specialists (55%) (p 0.012). They favored the statement of a DNAR order excluding treatment in a STROKE Unit at a lower frequency (2%) than the specialists (12%) (p= 0.016). There were no differences between residents and specialists regarding other statements on limitations caused by the DNAR order.

Almost all physicians, N=219 (77–100% across different specialties), agreed that the DNAR order should be recorded in the Risk Information section of the EHR. However, 38–69% of them reported difficulties documenting DNAR orders (Figure 3), more often among residents (66%) than among specialists (49%) (p=0.020).

Table 1. Perceived care limitations due to a do-not-attempt-resuscitation (DNAR) order. Participants (n=218) were allowed to select multiple options.

	Anesthesiology/ ICU n=56		Conservative departments n=80		Oncology n=8		Operative departments n=52		Pediatrics/ child neurology n=11		Psychiatry n=11	
	n	%	n	%	n	%	n	%	n	%	n	%
All resuscitation procedures	34	61	60	75	4	50	37	71	5	46	7	64
Cardio-pulmonary resuscitation (CPR) only	25	46	25	31	5	63	20	39	8	73	3	27
Treatment and follow up in intensive care unit (ICU)	23	42	38	48	5	63	29	56	10	91	2	18
Treatment and follow up in STROKE unit	4	7	3	4	1	13	10	19	1	9	0	0
Treatment and follow up in cardiac care unit (CCU)	3	6	1	1	1	13	7	14	1	9	0	0
Administration of intravenous (iv) fluids	0	0	0	0	0	0	0	0	2	18	0	0
Administration of antimicrobial treatments	0	0	0	0	0	0	0	0	1	9	0	0
All active treatment	4	7	1	1	0	0	1	2	1	9	0	0
All diagnostic electronic procedures	0	0	1	1	0	0	2	4	2	18	0	0
Cannot say / don`t know	0	0	0	0	0	0	0	0	0	0	1	9

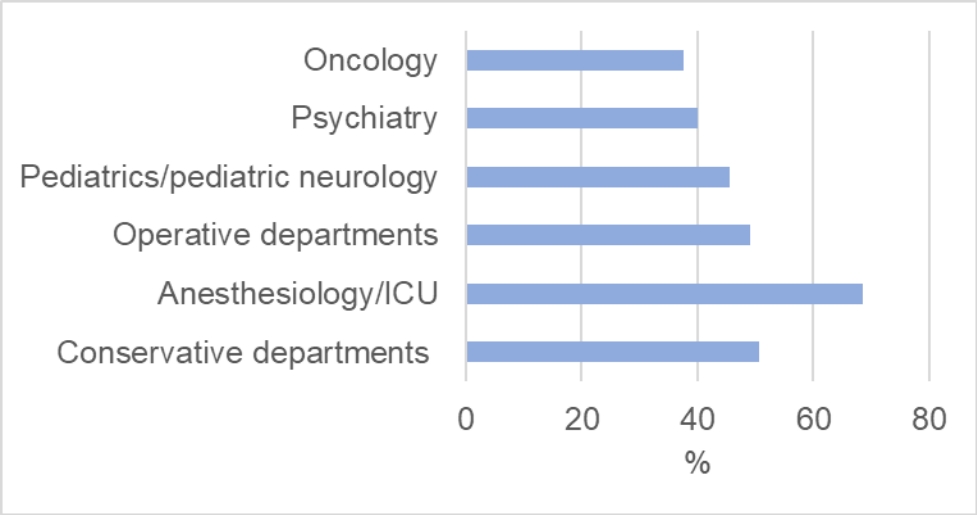

Figure 3. The percentages of doctors representing different specialties considering (n=218), that there are difficulties and/or challenges in the documentation of a do not attempt resuscitation (DNAR) order.

There was statistically significant variation in opinions across specialties regarding the adequacy of training in making a DNAR order (p=0.007). The highest frequencies in opinions of adequate training were observed in anesthesiology and oncology. Training in DNAR order-making was considered sufficient by 40% of the residents, compared with 61% of the specialists (p=0.007).

Discussion

In the present study, almost half of physicians in conservative and operative specialties, psychiatry, and pediatrics perceived DNAR order-making as challenging or complex. In contrast, less than one-third of anesthesiologists and oncologists found such problems. Oncologists' experience with terminal illnesses and anesthesiologists' work in critical care medicine may enable better awareness of the principles for making DNAR orders. It should be noted that we didn't find statistically significant differences between specialties, possibly due to a small number of doctors in each group. We did not specifically address the issue of DNAR orders made at the Emergency Department (ED) where the decisions may be more difficult in stressful situations and rapid pace of work and where availability of advance directives is generally low [36 40]. Most of the residents reported challenges with decision-making and interpreting DNAR orders. However, nearly half of them believed they could place the DNAR order themselves. The findings were statistically significant compared with those of specialists working in a hospital. It is well known that, in general, HCPs find DNAR order-making challenging [9,24,37] and that DNAR order-making involves complex medical, psychosocial, ethical, and emotional aspects [37]. In previous Finnish studies, physicians considered their competence in issuing DNAR orders sufficient [9], yet felt unsupported [2]. For physicians, making a DNAR order involves assessing several clinical factors, including prognosis, likely outcomes of CPR, and patient comorbidities [4].

The DNAR process is closely related to advance care planning. Recent research suggests that AI-based tools may be appropriate for identifying patients in whom a high.probabbility of frailty or death cane be predicted [41]. There are already AI-based DNAR

alerts in EHRs at some hospitals, including Tampere University Hospital, that aim to identify potential organ donors among patients with DNAR orders. The alert to recognize an organ donor is triggered when a physician issues a DNAR order under certain conditions. The next step in information technology (IT) development should include the use of AI to recognize situations in which a DNAR order should be considered. These triggers could include, e.g., patients' high age, certain terminal diagnoses, and laboratory findings. Furthermore, AI could recognize the patient's self-completed advance directive in the Kanta service and alert HCPs to document it in the risk information. So far, the patient's self-completed advance directive is only visible in Kanta services, making it impossible to find in a hectic ED setting, possibly leading to care decisions against the patient's will.

Depending on the specialty, 23–91% of physicians in our study considered that patients' and/or family members' opinions should influence the decision to issue a DNAR order. A competent patient can refuse any treatment, including life-sustaining treatment. Still, he/she cannot demand treatment, such as CPR, that a physician considers not to be in the person's best interests [4]. However, in a Swedish study, 16% of physicians stated that a patient's wish to receive CPR should always be respected [22]. In the same study, 8% of physicians considered that relatives could make the decision [22]. Although discussions on DNAR with patients and relatives are recommended, studies show that these discussions are often not done [12,13].

A previous Finnish study found that 70% of physicians considered a DNAR order to exclude CPR only, while 30% regarded it as implying palliative care [8]. In our study, there was also variation in opinion on what DNAR entails. Overall, almost two-thirds of oncologists, but fewer than 50% of respondents in the largest specialties (anesthesiology/ICU, conservative and operative specialties) regarded the DNAR order as excluding only CPR. A good level of awareness of the DNAR process among oncologists is probably due to their work with patients with severe or terminal illness and to appropriate training. Among respondents working in adult specialties, 42–63% considered ICU care to be excluded as well. Misinterpretation of the meaning of a DNAR order and challenges in implementing it in practice are common among physicians [15,24,30], and DNAR orders can be misinterpreted to mean that other treatments or procedures should be withheld [4]. Reportedly, a DNAR order is associated with decreased use of intubation, ventilation support, antibiotics, narcotics, chemotherapy, radiotherapy, or dialysis, and with patients being unable to be referred for surgery [15,25-27]. Doctors may assume that patients with a DNAR order would also prefer not to receive other interventions [14,30]. Thus, the significance of misinterpreting a DNAR order is that potentially beneficial treatments may be withheld against a patient's best interests, leading to suboptimal treatment [24,26,30]. On the other hand, many patients receive life-prolonging treatments during the last weeks of their life, indicating overtreatment [11]. A DNAR order may reduce the use of non-beneficial invasive treatment [25]. Indications for other life-prolonging treatments should be carefully considered, not to prolong suffering [6,11]. Variation in policies and heterogeneity in documentation may contribute to misunderstandings of the meaning of the DNAR order [6].

Physicians consider distinct documentation of the DNAR order as necessary [17]. In some countries, such as Sweden, health law stipulates documentation of DNAR orders [13]. According to a systematic review, DNAR orders are often inconsistently recorded [1]. However, a recent study in Norway found that a DNAR order was in place for 91% of patients

who died in the hospital, and in 94% of cases, the order was documented as critical information [11]. The frequency of documented DNAR orders varies by admission type and treating department: documentation is more common in acute than planned admissions, and DNAR orders are most ordered in internal medicine and pulmonology [33]. According to the Finnish National Institute for Health, a DNAR order should be recorded in the Risk Information section of the EHR by a doctor [32]. Almost all the physicians in our study agreed with this recommendation. However, many specialists and a significantly higher number of residents experienced challenges with documenting DNAR orders. Furthermore, documentation burden is a recognized problem among HCPs, and it is important to find solutions to address issues such as inaccurate and inefficient documentation [38], which could be improved by AI. A reduction in clinician workload through streamlined documentation processes led to more time for patient care. However, the use of AI also raises concerns, such as legal and ethical challenges, as well as management fault documentation. [39]. Overall, physicians' confidence in DNAR discussions is lower than their confidence in other medical discussions [31].

Several studies have highlighted the need to improve education on DNAR orders [15,24,31]. Many physicians report learning communication skills related to DNAR orders and end-of-life discussions through clinical experience [3]. Lack of adequate training in the DNAR order process and its implementation is likely the main reason for the considerable variation among specialties in perceived adequacy of training in DNAR order making. Lowest rates were observed in pediatrics, pediatric neurology, and psychiatry. This may reflect the views of both educators and trainees in these fields that CPR and/or DNAR are not common issues. Most residents in the present study considered their training in DNAR order-making inadequate, an issue previously identified [19]. There is an evident need for training in the DNAR process to residents [2,31], and they would probably benefit from more interactive, experiential learning opportunities, including simulations and coaching [34]. Promising strategies include multi-modal training involving self-reflection and case-based discussions [31]. Research on education in DNAR decision-making is sparse [10], and more evidence is needed on the most effective strategies and methods for updating the knowledge and skills required for the DNAR process [34]. Physicians also need to reconsider their attitudes: although many doctors are aware of available guidelines in making DNAR orders, less than 30% have read them [13].

A strength of our study is the participation of a large sample of hospital specialists and residents from a wide range of medical specialties across three secondary/tertiary care hospitals. However, we do not know the actual response rate because the exact number of physicians working in the index hospitals at the time of the survey is unavailable. We recognize that the number of doctors who answered, especially in oncology and pediatrics/child neurology, was low. Although DNAR policies and practices vary among hospitals, our study offers a representative overview of how DNAR orders are made and the documentation challenges they pose in specialized care in Finland. These findings underscore the need for clearer national guidance and improved training to support consistent, patient-centered DNAR decision making.

Conclusions

Hospital residents face significantly more challenges in the DNAR order-making process than specialists do. Although both groups agreed that DNAR orders should be documented in the risk

information section of the EHR, accurate documentation remains a challenge. To improve clarity and consistency, structured communication and comprehensive education on end-of-life decision-making, including DNAR protocols, should be integrated into all clinical specialty training programs. Furthermore, the adoption of AI-driven decision-support tools within EHR systems might offer a promising approach to help healthcare professionals identify appropriate situations for DNAR orders and ensure standardized documentation.

Conflict of interest

All the authors declare no conflicts of interest.

Acknowledgements

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Publication ethics and publication malpractice statement

An institutional approval was obtained from the chief physicians of all the hospitals where the survey was conducted. The study was conducted in compliance with the National Act on Medical Research and guidelines in nonmedical research. According to the Act on Medical Research, for nonmedical research, an approval of an Ethics Committee is not required for research in adults that does not involve intervening with the physical integrity of research participants or exposing participants to exceptionally strong stimuli or sensitive issues.

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