

'Do Not Attempt Resuscitation' and 'Cardiopulmonary Resuscitation' in an Inpatient Setting: Factors Influencing Physicians' Decisions in Switzerland

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Key Words

Resuscitation orders · Clinical ethics · Patient participation · Switzerland · Europe

Abstract

Objective: To determine the prevalence of cardiopulmonary resuscitation (CPR) and do-not-attempt-resuscitation (DNAR) orders, to define factors associated with CPR/DNAR orders and to explore how physicians make and document these decisions. **Methods:** We prospectively reviewed CPR/DNAR forms of 1,446 patients admitted to the General Internal Medicine Department of the Geneva University Hospitals, a tertiary-care teaching hospital in Switzerland. We additionally administered a face-to-face survey to residents in charge of 206 patients including DNAR and CPR orders, with or without patient inclusion. **Results:** 21.2% of the patients had a DNAR order, 61.7% a CPR order and 17.1% had neither. The two main factors associated with DNAR orders were a worse prognosis and/or a worse quality of life. Other factors were an older age, cancer and psychiatric diagnoses, and the absence of decision-making capacity. Residents gave four major justifications for DNAR orders: important comorbid conditions (34%), the patients' or their family's resuscitation preferences (18%), the patients' age (14.2%), and the absence

of decision-making capacity (8%). Residents who wrote DNAR orders were more experienced. In many of the DNAR or CPR forms (19.8 and 16%, respectively), the order was written using a variety of formulations. For 24% of the residents, the distinction between the resuscitation order and the care objective was not clear. 38% of the residents found the resuscitation form useful. **Conclusion:** Patients' prognosis and quality of life were the two main independent factors associated with CPR/DNAR orders. However, in the majority of cases, residents evaluated prognosis only intuitively, and quality of life without involving the patients. The distinction between CPR/DNAR orders and the care objectives was not always clear. Specific training regarding CPR/DNAR orders is necessary to improve the CPR/DNAR decision process used by physicians.

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Introduction

In many countries, physicians make daily decisions whether or not to attempt resuscitation for individual patients in case of cardiac arrest and write cardiopulmonary resuscitation (CPR) and do-not-attempt-resuscitation (DNAR) orders. Studies have described an impor-

tant variability in the frequency of DNAR orders [1–14] and the way in which these decisions are made in different hospitals, [1, 3, 6, 15, 16]. Orders vary depending on the involved physicians [1, 17–19]. This variability reflects the fact that making these decisions is difficult and that specific training is often lacking.

Almost all studies designed to understand which patients and physicians' characteristics are associated with CPR/DNAR orders have been conducted in the USA. Little information is available in Europe [20] and only three studies were conducted in Switzerland [12, 20, 21]. Decisions regarding CPR/DNAR orders are, however, a frequent cause of recognized ethical difficulty in Europe also, including in Switzerland [22].

In the General Internal Medicine Department of the Geneva University Hospitals, a tertiary university teaching hospital in Switzerland, a CPR/DNAR prescription using a specific form is required for each patient. Local law specifies that healthcare providers must honor a competent patient's refusal of even life-sustaining interventions, and must respect an incompetent patient's advance directives. Healthcare providers must further abstain from superfluous or inappropriate interventions. This is generally understood to include CPR in some cases, when it is considered 'futile'.

In this setting, we conducted a study to assess (1) the prevalence of DNAR orders, (2) the factors associated with CPR and DNAR orders, (3) how physicians understand the meaning of these orders, (4) how they reach decisions regarding CPR/DNAR orders, (5) the way in which they document them, and (6) whether the orders are discussed with patients or not, including the reasons for or against discussion [23–25]. In this paper we report results regarding points 1–5. The issues surrounding whether, when, and how to discuss DNAR orders with the patient are the object of ongoing debate and are summarized in a different paper [B.S. Elger et al.: Factors associated with the participation of patients in 'do not resuscitate' (DNR) and 'cardio-pulmonary resuscitation' (CPR) orders in a Swiss tertiary hospital, submission forthcoming].

Based on existing data, we hypothesized that residents do not clearly separate the issue of cardiopulmonary resuscitation from other care issues [12]. We further anticipated that patients with DNAR orders would be older [1–4, 7, 9, 15, 26], have more comorbid conditions [1–7, 9, 15–17, 27, 28], terminal diseases such as cancer [2, 4, 5, 7, 27, 28], advanced heart failure [27] or advanced COPD [27], a poorer quality of life [1], shorter life expectancy [1, 15, 16, 26, 29] and longer hospital stays [30] than patients with CPR orders.

Participants and Methods

Study Population

Our study was conducted in 6 wards (a total of approximately 100 patient beds) of the General Internal Medicine Department of the Geneva University Hospitals in Switzerland, a tertiary university teaching hospital, during 12 months, from April 2004 to May 2005.

We collected CPR/DNAR prescription forms once a week after identification of all new admissions to the relevant wards. Medical records of admitted patients contain a specific CPR/DNAR prescription form, to be completed during admission in order to specify for each patient whether in his/her case a CPR or a DNAR order applies in case of cardiopulmonary arrest. All available forms were included.

In order to explore factors associated with CPR or DNAR orders, we more closely examined a sample of consecutive cases containing approximately equal numbers (about 50 cases) of patients from four categories defined on the basis of the resuscitation order, and of whether or not the decision had been discussed with the patient. These groups were: discussed DNAR, undiscussed DNAR, discussed CPR, and undiscussed CPR. Patient cases were included if the resident in charge of the patient was available in his/her office and consented to filling in a short face-to-face questionnaire. Research assistants approached as many different residents as possible in order to avoid overrepresentation of a few particularly available and willing residents.

Data Collection

We collected all information available on CPR/DNAR prescription forms. These forms include the following items: patient's identity and demographic factors (age, sex), the date of the order, the CPR or DNAR order, its justification, the objectives of care, whether the order was discussed with the patient, and the signatures of the physicians who completed the form.

For the physician questionnaire, we developed items based on a literature review of factors associated with CPR or DNAR orders, and with patient participation in end-of-life decisions. The questionnaire covered the following topics: main diagnosis, other current or previous medical conditions, prognosis as estimated by the resident (>5 years, 1–5 years, 6 months to 1 year and <6 months), medical condition determining the prognosis, previous admissions to intensive care, initial order (CPR or DNAR), justification provided for the order by the resident, any changes in the type of order, care objectives, existence of advance directives, patients' quality of life as evaluated by the resident and others, such as patient, family or treating physician if applicable (Likert's scale range from 1 = very poor to 7 = very good), decision-making capacity as reported by the resident, and the manner in which it had been assessed. The questionnaire also included an item recording if resuscitation was attempted during the patient's hospital stay. Residents' demographics included age, sex, postgraduate training, as well as training in ethics and more specifically on CPR/DNAR decisions. The full questionnaire is available on request.

To minimize recall problems, residents who consented to participation were asked to fill in the questionnaire 1–6 days after the patients' admission to the ward.

This study was submitted to the chair of the hospital research ethics committee who designated it as quality control and exempt from full ethics committee review.

Statistical Analysis

Data were analyzed using descriptive statistics. Bivariate correlations were analyzed using Pearson's χ^2 , Student's *t* test or non-parametric tests as appropriate. We selected a significance level of 0.05 (two-tailed). Logistic regression was used to identify variables independently associated with the CPR/DNAR order. The model was built using the variables found to be associated with the CPR/DNAR order in bivariate analysis. We used the SPSS 13.0 version to perform the tests.

Results

Responses

We examined 1,446 records during weekly screenings (47% of the 2,911 admissions during the study period). The prescription was DNAR in 21.2% and CPR in 61.7%, and 17.1% records gave no indication. Responses to the resident questionnaire included 100 CPR orders, of which 51 had been discussed with the patient, and 49 had not, and 106 DNAR orders, of which 56 had been discussed with the patient, and 50 had not. A total of 85% of all residents who were in charge of the patients during the study period participated in the study by filling in at least one questionnaire and 98% of all approached residents consented to participation. In 3 cases, refusal was due to time constraints, and 1 resident answered an insufficient number of questions to be included. The 206 patients were treated by 61 different residents. Demographic characteristics of patients with DNAR and patients with CPR orders are depicted in table 1.

Factors Associated with CPR and DNAR Orders

Patient- and disease-related factors associated with CPR and DNAR orders are shown in table 2. The two main factors significantly associated with the DNAR orders were a worse prognosis as estimated by the resident ($p < 0.001$) and poorer quality of life as reported by the resident ($p < 0.001$). The other factors were diagnoses of cancer ($p = 0.04$) or of a psychiatric problem ($p = 0.005$). CPR patients had more frequently been admitted to intensive care before their stay in the internal medical unit ($p = 0.03$). Patient with DNAR orders stayed on average 3 days longer in the hospital ($p = 0.02$).

Justifications of Orders Provided by the Residents

Residents gave four major justifications for DNAR orders: important comorbid conditions (34%), the patient or his family resuscitations' preferences (18%), the patients' age (14.2%), and the absence of decision-making capacity (8%; most of them because of dementia). For the

Table 1. Demographic characteristics of patients with DNAR and CPR orders

	DNAR (n = 106)	CPR (n = 100)	p
Mean age, years	75	68	<0.001
Age max/min, years	24/101	29/94	
Men, %	58.3	41.7	0.68
Number of children	1.44	1.55	0.46
Lacked decision-making capacity, %	21.9	6.1	0.005

Table 2. Patient- and disease-related factors associated with DNAR and CPR orders

	DNAR (n = 106)	CPR (n = 100)	p
Length of hospitalization, days	16.9	13.9	0.02
Previous admission to intensive care unit, %	12.4	24	0.03
Main diagnosis			
Cancer, %	38.8	25.3	0.04
Psychiatric, %	12.9	2.1	0.005
Cardiac insufficiency, %	14.9	17.9	0.57
COPD, %	13.9	10.5	0.48
Prognosis ¹			<0.001
<6 months	43.8	6.1	
6 months to 1 year	24.8	7.1	
1–5 years	26.7	32.3	
>5 years	4.8	54.5	
Quality of life ¹			<0.001
Very bad, bad, %	35.0	8.7	
Moderate, %	36.9	26.1	
Good, very good, %	28.1	65.2	
Evaluated, %	96.2	93.9	0.46
Number of medications at the hospital discharge	6.52	6.94	0.73
Number of comorbid conditions	6.48	6.02	0.27

¹ Evaluated by the resident.

CPR patients the residents frequently indicated the same factors in reverse as justifications: the absence of comorbid conditions with a good health status (13%), patients' resuscitation preferences (12%) and patients' age (8%). In addition, a good quality of life (9%) was also a frequently provided justification.

Decision-Making Process

Residents consulted other members of the medical staff and the patients' family more frequently for DNAR orders

Table 3. Documenting care objectives

Order	Care objective	%
DNAR	Admission to the intensive care unit	21.7
	No intensive care unit transfer	5.7
	Maximum ward care	22.6
	Comfort care	6.6
	Palliative care	1.9
	Hospital discharge and return home	<1
	More detailed care objective:	9.4
	– Intensive care unit admission for respiratory problems but not for hemorrhage	
	– Intensive care unit only for non-invasive ventilation	
	– Intensive care unit for non-invasive ventilation, no intubation	
	– Intensive care unit for non-invasive ventilation or digestive hemorrhage, no intubation	
	– Intensive care unit, dialysis, no intubation	
	– No intensive care unit, no intubation, intermediate care unit	
	– No intensive care unit for intubation in case of massive hemoptysis	
	– Intensive care unit admission for shock, vasoactive drugs (waiting for more information from GP but chemotherapy is an adjuvant treatment), okay for dialysis, no unreasonable obstinacy	
CPR	Intensive care unit	49
	Hospital discharge and return home	3
	Investigation of a brain attack	1
	Palliative	1

than for CPR orders (71.2 vs. 41.8% for the supervising physicians, $p < 0.001$; 13.2 vs. 4% for the family doctor, $p = 0.02$; 31.1 vs. 13% for the patients' family, $p = 0.002$). By contrast, residents consulted nurses only very rarely (7.3% of cases), with no difference between the two groups. Patients' quality of life was evaluated in 92.8% of the cases; in 67.7% of these cases, quality of life was assessed by hospital physicians only; families, patients, and the patient's family doctor were included 9.4, 26.6, and 1.6% of the time, respectively. Patients' decision-making capacity was evaluated by the residents alone in over 95% of cases.

Documenting CPR/DNAR Orders

In our analysis of documentation forms we found that in 19.8% of the DNAR and 16% of the CPR orders, residents indicated added details in addition to the resuscitation order itself. In the majority of these cases, residents wrote the 'code status' and added whether the patient should be admitted to intensive care or not (11.3% for the DNAR and 13% for the CPR). In 7.6% of the DNAR orders

Table 4. Characteristics of residents who generated the DNAR and CPR orders

Characteristics of residents	DNAR (n = 106)	CPR (n = 100)	p
Years of clinical experience			
Mean	3.23	2.54	0.003 ^a
Standard deviation	1.55	1.56	
Median	3.00	2.00	
Training in CPR/DNAR orders ^b , %	37 (38.9)	27 (30.3)	0.22
General ethical training during medical school, %	92 (95.8)	87 (96.7)	0.77

^a Mann-Whitney ($p = 0.002$ for Student's t test).

^b Information available for 184 cases.

an indication regarding intubation or non-invasive ventilation was added. As shown in table 3, some forms included comments regarding care objectives other than those directly related to cardiopulmonary resuscitation (e.g. 'return home').

Orders were changed infrequently: only 8.8% of cases, mostly from a CPR to a DNAR order.

Residents' Attitudes towards CPR/DNAR Decisions and Documentation

Overall, 38% of residents found the resuscitation form useful, especially for the physician on call during the night and on weekends. For 24% the distinction between the resuscitation order and the care objectives were not always clear; one of the cited examples was a DNAR order with specification that intensive care admission, or intubation, were allowed. Some residents found it difficult to discuss resuscitation preferences with the patient, especially on the first day of the patients' hospital admission, or if the residents were young. They complained about insufficient training regarding the CPR/DNAR order form and about how to discuss this topic with patients. They reported an important variability between residents regarding CPR/DNAR decisions and noted difficulties when a patient preferred a CPR order and the physician found cardiopulmonary resuscitation to be futile for this patient. Finally, the residents found it difficult to make CPR/DNAR decisions on their own.

Resident-Related Factors

Resident-related factors associated with CPR and DNAR orders are shown in table 4. Residents with more

years of clinical experience were more likely to have written a DNAR order (mean years of clinical experience for residents having written DNAR vs. CPR orders: 3.23 vs. 2.54 years, $p = 0.003$), and to have received specific training about CPR/DNAR (3.6 ± 1.5 compared to 2.5 ± 1.6 years of clinical experience for residents not trained in the establishment of CPR/DNAR orders, $p < 0.001$). Overall, a third (34.8%) of residents reported having received such training. Almost all residents had received general ethics training during medical school and no statistically significant differences were found for ethics training according to the type of order.

Discussion

Our study confirms several findings from other studies. Prognosis as estimated by residents was the strongest independent predictor for the type of order, with DNAR patients having a worse prognosis than CPR patients. Many studies found similar associations [1, 15, 16, 26, 29]. In our study, prognosis was almost always evaluated by residents without use of prognostic scales. It is possible that more accurate prognostic evaluation would be associated with different resuscitation decisions. If prognosis plays such an important role for a resuscitation decision, evaluation errors should be minimized as much as possible by using available scores related to overall survival and in particular survival related to CPR, such as pre-arrest morbidity (PAM) scores and prognosis after resuscitation (PAR) scores [31, 32].

Residents' assessment of patients' quality of life was another strong independent predictor for the type of order (CPR vs. DNAR). Residents, however, asked patients about their quality of life in only a minority of cases. While other studies [21, 33] confirm the importance of quality of life arguments for physicians' DNAR decisions, they also cast doubt on its justification. Physicians underestimate patients' own assessments of their quality of life in almost half of the cases. Moreover, patients' evaluation of their own quality of life is not associated with their preferences for or against cardiopulmonary resuscitation. In addition, agreement between physicians and patients about patients' quality of life was not associated with their agreement on resuscitation preferences. Physicians should be aware of these findings; caution is required when using physician estimated quality of life to guide resuscitation decisions.

Diagnoses of cancer and psychiatric problems were associated with DNAR orders, independently of the disease

prognosis. Several authors [3–5, 15, 27, 28] have noted an association between the type of diagnosis and the resuscitation order. Data suggest that this association persists even for patients with the same prognosis [6, 17]. Two explanations are possible. First, we know that even for diagnoses with the same prognosis, the probability of survival after a cardiopulmonary resuscitation can be affected by the underlying pathology. Second, physicians' perceptions of some diagnosis like cancer and lateral amyotrophic sclerosis are worse, even when the prognosis is the same. Whereas the first explanation is based on scientific reasons, the second is based on subjective judgment regarding how 'bad' the disease is from physicians' viewpoints. While a higher prevalence of DNAR orders in some diseases independently of the prognosis is justified if physicians' decisions reflect patients' wishes to limit resuscitation in these 'difficult' diseases, basing the same decisions on physician bias regarding these diseases is clearly harder to justify.

Our study is original in that it provides unique data on the way in which mostly young residents grapple with the requirement to decide about the resuscitation code of their patients at admission and how they justify their decisions. Such data are important in order to tailor procedures and teaching in a way that fosters respect for patient autonomy in this sensitive area. The most frequent justifications given by residents for writing DNAR versus CPR orders (patients' preferences, age, diagnosis and health status, in particular mental and psychological functioning, as well as their quality of life as assessed by residents) were indeed associated with the type of resuscitation order in our analysis. Our findings thus suggest that residents have a good general level of awareness as to the factors they include in such decisions. Furthermore, some of these justifications, such as health status, and especially prognosis for survival after CPR, are relevant when considering medical benefit of resuscitation. However, the predictive meaning of age by itself is not always clear. When futility of CPR is evaluated, several factors including age, health status, and especially quality of life require input from patients to become relevant. A middle-aged patient in good health or a patient with a good quality of life would not automatically prefer CPR. An older patient would not always opt for a DNAR order. As studies have shown, the concept of futility is not limited to physiological parameters, but always contains an evaluative part that implies individual values related to usefulness, and 'worth' of the intervention ('the outcome is worth the effort') [34] and can include consideration of the patient's quality of life [35], with its attendant assessment difficul-

ties. Our study shows that residents also need more education on these complex issues to improve ethical decision-making concerning resuscitation.

Some aspects of CPR/DNAR documentation corroborate the interpretation that more training would be useful. The form was not used as intended by its authors, but frequently included comments or other specifications, which did not always clarify the resident's intentions. The distinction between the order and the care objective was often lacking, and was described by residents as difficult. Residents also commented that the DNAR orders were occasionally misinterpreted as 'doing nothing' and that some situations (such as a patient with a DNAR order and a transfer to the intensive care unit allowed) were not clear. Similar experiences are reported elsewhere [5, 26] and our study shows these difficulties to persist despite the existence of guidelines for CPR/DNAR order decisions in our hospital. Although the forms do not include a checklist of measures to withhold in case of cardiopulmonary arrest, they do include a definition of CPR and the measures which it includes. A major cause for the substantial variability in the decision process thus seems to have been misunderstanding or ignorance of the guidelines. Data suggest that important variability in DNAR orders exists among different hospitals also [1, 3, 6, 15, 16] and that a standardized DNAR form significantly enhances clarity, as well as confidence about which measures to withhold [36–38]. These procedure-directed orders have been reported to improve communication among healthcare personnel, but had no measurable impact on the frequency of discussions with the patient or his family. All these findings point to the need to provide specific training regarding CPR/DNAR decisions and documentation in a more intensive and systematic manner, even when a standardized form is implemented. Some fundamental points like the meaning of a DNAR order, the difference between the resuscitation order and the care objective were not clear for the residents. Which factors need to be part of the decision process and how to evaluate them (for example the prognosis or the quality of life) and how to discuss resuscitation preferences with patients must also be part of the specific training.

Residents who had written DNAR orders were significantly more experienced, as measured by years in postgraduate training, than residents who established CPR orders. This corroborates other studies [18, 19], and could have several reasons. Since admissions are attributed alternately among residents based only on the time of arrival, it is unlikely that untrained or less experienced res-

idents treated more patients with better prognoses. As CPR is the default code status, it may be perceived by residents as a lower risk, both to patient survival (better to mistakenly resuscitate than to mistakenly abstain), and to themselves. Deciding on a CPR order could be perceived as avoiding ethical reasoning. Less experienced residents, then, may choose this option more often, either because they are under more stress or because they are less able to identify situations in which DNAR orders are indicated. A third explanation would be that they simply do not feel experienced enough to make an end-of-life decision. They might fear 'shortening' the life of a patient if they write a DNAR order. While writing more DNAR orders cannot be a goal in itself, the association of DNAR orders with residents' experience and training does suggest that some CPR orders may be inappropriate and that more systematic training should be developed.

Our study has several limitations. Despite very frequent collection, we included only 47% of admissions to the study wards. The most likely explanations are that we undersampled patients whose stay was very short, either because they left the hospital, were transferred early to a different service, or died within a few days of admission. These patients are as likely to have been more severely ill, or less severely ill, leading the opposing sampling biases to cancel each other at least in part. A low percentage of patients (58 patients, 2% of the admissions) died during our study period in the 6 medical wards of the study, but we could have missed patients who were transferred quickly to the intensive care unit or to rehabilitation hospitals. Our questionnaire sample included only 206 cases. These cases were not chosen entirely randomly. Instead, the aim was to include a high number of different residents. As we depended on the presence and availability of residents, we may nevertheless have selected residents who are more interested in ethical questions than those who might have tried to 'escape' the attention of the research assistant. However, the fact that we interviewed 85% of the residents in charge of the patients shows that our sampling strategy was successful to include a large majority of the physicians whose attitudes we intended to capture. We might also have an overrepresentation of temporary residents who were substituting and who are less experienced than their more stable colleagues employed for a period of several years during residency. As in other questionnaire studies, a bias could exist towards obtaining socially accepted answers. We tried to reduce this bias by guaranteeing complete confidentiality regarding respondents' identity and their answers, especially towards the clinical hierarchy. Questionnaires and

answers were kept strictly confidential, the research assistant was an advanced medical student with no link to the interviewed physicians, identities were kept secret from senior members of the research team who worked in the surveyed department, and this was made clear to respondents. Moreover, the fact that residents did report a high number of socially/professionally undesirable attitudes, such as involving nurses in resuscitation decisions extremely rarely, that they spoke openly about difficulties in making CPR/DNAR decisions, and that they admitted ignorance as to why orders and resuscitation preferences were not discussed with patients, indicates that this bias was low. Finally, we lack information about resuscitation preferences of patients whose orders were examined in our study. Therefore, we are unable to evaluate whether patients' preferences were respected.

Conclusion

Patients' prognosis and quality of life were the two main independent factors associated with CPR/DNAR orders. However, in the majority of cases residents evaluated prognosis without scales, and quality of life without involving the patients. The distinction between CPR/DNAR orders and the care objectives was not always

clear, despite the presence of a written definition on the CPR/DNAR prescription form. Our results generally suggest the adoption of guidelines and specific prescription forms to be a welcome but insufficient measure. Residents had a good general level of awareness as to the factors they included in such decisions, but some of these factors would have required input from patients to become relevant, and CPR/DNAR orders were not always documented clearly. These findings point to a need for more systematic training, at pre- and postgraduate levels, regarding the meaning of the CPR/DNAR orders, the difference between the care objective and the resuscitation order, the skills for the decision-making and for determining the patient's prognostic and quality of life, how to document the CPR/DNAR orders, as well as how to discuss resuscitation preferences with patients. Indeed, residents participating in our study reported such a need themselves.

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