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Clinical paper

Low adherence to legislation regarding Do-Not-Attempt-Cardiopulmonary-Resuscitation orders in a Swedish University Hospital



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Abstract

Background: The ethical principles of resuscitation have been incorporated into Swedish legislation so that a decision to not attempt cardiopulmonary resuscitation (DNACPR) entails (1) consultation with patient or relatives if consultation with patient was not possible and documentation of their attitudes; (2) consultation with other licensed caregivers; (3) documentation of the grounds for the DNACPR. Our aim was to evaluate adherence to this legislation, explore the grounds for the decision and the attitudes of patients and relatives towards DNACPR orders.

Methods: We included DNACPR forms issued after admission through the emergency department at Karolinska University Hospital between 1st January and 31st October, 2015. Quantitative analysis evaluated adherence to legislation and qualitative analysis of a random sample of 20% evaluated the grounds for the decision and the attitudes.

Results: The cohort consisted of 3583 DNACPR forms. In 40% of these it was impossible to consult the patient, and relatives were consulted in 46% of these cases. For competent patients, consultation occurred in 28% and the most common attitude was to wish to refrain from resuscitation. Relatives were consulted in 26% and they mainly agreed with the decision. Grounds for the DNAR decision was most commonly severe chronic comorbidity, malignancy or multimorbidity with or without an acute condition. All requirements of the legislation were fulfilled in 10% of the cases.

Conclusion: In 90% of the cases physicians failed to fulfil all requirements in the Swedish legislation regarding DNAR orders. The decision was mostly based on chronic, severe comorbidity or multimorbidity.

Keywords: Resuscitation orders, Do Not Attempt Cardiopulmonary Resuscitation, DNACPR, DNAR, Terminal care, Jurisprudence

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Table 1 – Examples of the content analysis of free text for prognosis of the medical condition as grounds for Do-Not-Attempt-Cardiopulmonary-Resuscitation orders for patients admitted to Karolinska University Hospital through the emergency department between 1st January and 31st October, 2015.

Condensed meaning unit	Code	Subcategory	Category
Severe COPD. [Form number 2524]	Chronic comorbidity severe state ^a	Chronic comorbidity severe state	Chronic comorbidity severe state ±Acute condition
Progressive pulmonary fibrosis, pulmonary embolism with pulmonary hypertension, unclear infection without treatment response. [Form number 1811]	Chronic comorbidity severe state	Chronic comorbidity severe state with acute condition	Chronic comorbidity severe state
Diabetes Mellitus, dialysis, status post myocardial infarction, non-operable abdominal aortic aneurysm. [Form number 3778]	Acute condition Multimorbidity ^b	Multimorbidity	±Acute condition Multimorbidity
95-years, multimorbidity, severe aortic stenosis. [Form number 2743]	Age Multimorbidity Chronic comorbidity severe state	Age Multimorbidity Chronic comorbidity severe state	±Acute condition Frailty ± acute condition Multimorbidity ±Acute condition Chronic comorbidity severe state ±Acute condition Acute condition
Sepsis with anuria. [Form number 3937]	Acute condition	Acute condition	Acute condition
Breast cancer, thromboembolic disease, dementia. Prognosis in case of a cardiac arrest is assessed as poor with regards to impaired cognition, high age, multimorbidity. [Form number 2436]	Malignancy Multimorbidity Poor prognosis in the event of a cardiac arrest Age	Malignancy Multimorbidity Poor prognosis in the event of a cardiac arrest Age	Malignancy ±Acute condition Multimorbidity ±Acute condition Poor prognosis in the event of cardiac arrest ± acute condition Frailty ± acute condition Frailty ± acute condition
Age and prognosis. Wish from patient. [Form number 326]	Age Prognosis underlying medical condition unspecified Patient's own wish	Age Prognosis underlying medical condition unspecified Patient's own wish	Frailty ± acute condition Chronic comorbidity severe state ±Acute condition Patient's or relatives' wish ± acute condition

Abbreviations: COPD Chronic Obstructive Pulmonary Disease, authors' comment. ^aA comorbidity that is termed severe/grave/serious/pronounced in the free text. ^bDefined as the coexistence of two or more chronic conditions or the word 'multimorbidity' used in the text.⁴⁰ Due to the definition of multimorbidity the category multimorbidity ± acute condition was not exclusive, and could comprise the category chronic comorbidity severe state ± acute condition and/or malignancy ± acute condition.

Introduction

The ethics of resuscitation are based upon the ethical principles of autonomy, beneficence, non-maleficence, and justice.¹ A Do-Not-Attempt-Cardiopulmonary-Resuscitation (DNACPR) order may be issued when the patient does not wish to receive cardiopulmonary resuscitation (CPR), or when CPR is considered non-beneficial. As in some other countries,² these ethical principles have been incorporated into Swedish legislation, stating that healthcare should be planned and carried out in consultation with the patient as far as possible,^{3,4} especially taking into consideration the respect for autonomy and integrity.⁵ Unless secrecy applies, relatives should be given the opportunity

to take part in healthcare planning.⁴ The patient's and relatives' values and preferences regarding resuscitation should be documented in the electronic patient record.⁶ If consultation with the patient is not possible, the reason should be documented and relatives should be consulted as far as possible.^{4,6} Further, grounds for the DNACPR decision should be documented in the patient record and when the decision is based on the consideration that CPR would not be beneficial, it should be made after consultation with at least one other licensed caregiver.⁶ Previous publications have shown varying involvement of the patient in the DNACPR decision, ranging from six to 70%.^{7–17} Although there is extensive research regarding DNACPR orders in several aspects, the majority of studies are smaller or based on questionnaires or focus groups exploring attitudes and clinical

practice,^{7–19} but without evaluation of the actual clinical practice performed. Therefore, we conducted a larger study based on the documentation of DNACPR orders in the electronic patient record with the aim to evaluate adherence to this legislation regarding (1) consultation with patient or relatives if consultation with patient was not possible and documentation of their attitudes; (2) consultation with other licensed caregivers; and (3) documentation of the grounds for the DNACPR. Additional aims were to explore the grounds for the decision and the attitudes of patients and relatives towards DNACPR orders.

Methods

Study design

This was a retrospective cohort study including quantitative and qualitative data.

Study population and data collection

This cohort included all adult patients with a national registration number admitted through the emergency department (ED) at Karolinska University Hospital (KUH) between 1st January and 31st October, 2015 with at least one DNACPR order issued during their hospital stay. The study sample was a sub-cohort of a larger cohort of ED admissions with complete pre-collected data. It is mandatory to fill out a form for every DNACPR order issued and this period was chosen because later-revised versions of the form did not allow for evaluation of prognosis of the medical condition as grounds for the DNACPR decision and the patient's wish as grounds for the DNACPR decision. KUH is a teaching hospital with neurosurgical and cardiothoracic surgical units and it serves as the trauma referral center in Stockholm, Sweden, a region with 2,2 million inhabitants. In 2015, KUH comprised approximately 900 adult beds at two sites and the adult EDs received approximately 150,000 visits. Patients were recruited and data regarding age, admission ward, length of stay, and mortality as well as detailed information about the DNACPR orders was retrieved through the hospital's central data warehouse that holds data from 2009 onward. Comorbidities were identified through linkage with the National Patient Register (NPR) from 1997 until date of admission. The NPR contains information about diagnoses and surgical procedures from all hospital admissions in Sweden according to the International Statistical Classification of Diseases-10.

The form for the DNACPR order was designed with boxes to tick for consultation with the patient (yes/not possible), relatives, and other licensed caregivers, as well as to specify whether the grounds for the decision were prognosis of the medical condition and/or the patient's wish. The form enabled additional free-text writing for the following headings: prognosis of the medical condition as grounds for the DNACPR order; patient's attitude towards the DNACPR order; relatives' attitudes towards the DNACPR order; reason why consultation with the patient was not possible; which relatives had been consulted and which other licensed caregivers had been consulted. A random selection of 20% under each heading that contained free text was selected for qualitative content analysis. The free text was extracted by copying the text in the forms in the electronic patient journal to an Excel spreadsheet.

Data analysis

Quantitative analysis was performed to evaluate adherence to the legislation: (1) consultation with patient or relatives if consultation with patient was not possible and documentation of their attitudes; (2) consultation with other licensed caregivers; and (3) documentation of the grounds for DNACPR. Chi-squared test was used to compare binary variables, logistic regression to compare categorical variables and linear and quantile regression with bootstrap to compare continuous variables using Stata 13 for Windows (Stata Corp, College Station, TX). Significance tests were two-sided with a significance level of 0.05.

Inductive qualitative content analysis with guidance of a medical perspective was performed to evaluate the attitudes of the patients and relatives towards DNACPR orders, grounds for issuing the DNACPR orders and the reasons for consultation with the patient being impossible.²⁰ Each heading previously specified, was analysed separately. Meaning units were extracted from the free text and further textualised into condensed meaning units that were analysed and coded. These codes were sorted into subcategories that were then fused into broader categories based on similarities and shared content. The categories were sorted into themes when appropriate. Examples of condensed meaning units, codes, subcategories, and categories for prognosis of medical condition as grounds for issuing the DNACPR order are shown in Table 1. Three of the authors (EP, KR, EB) performed the preliminary analysis under the responsibility of (EP). To increase credibility, 10% of the free text was coded independently by a senior clinician and researcher (TD) and any discrepancies were discussed until consensus was reached (EP, TD). The preliminary analysis was then discussed and revised with three researchers and senior clinicians (EP, KG, TD) until consensus was reached and interpretation of the results was discussed with the whole research team.

Ethical considerations

The study was approved by the Regional Ethical Review Board in Stockholm (2019-02142).

Results

During the study period, 25,635 admissions to a hospital ward were made through the ED at KUH, out of which 2795 (11%) were admissions where at least one DNACPR order was issued during the hospital stay. Since a change of ward at the hospital requires a new form and a new form can be issued at any given time, a total of 3859 DNACPR orders were issued during the study period. After exclusion of 276 forms where DNACPR status was incomplete, 3583 DNACPR orders constituted the cohort. A consultant was responsible for the DNACPR order in 73% of the DNACPR decisions, a licensed physician in 23%, and for the rest there was no documentation regarding the responsible physician.

Consultation with the patient

Of the 3583 forms, consultation with the patient was not possible in 40% (1432/3583). Among these, the reason was stated in 82% (1181/1432), a relative was consulted in 46% (653/1432), and the attitude of the patient or relatives was documented in 30% (436/1432). For the

rest, the patient was consulted in 28% (601/2151) and their attitude documented in 15% (320/2151) (eTable 1).

Reasons why consultation with the patient was not possible

Content analysis of 237 forms for reason why consultation with the patient was not possible yielded two themes: *Patient deemed unable to comprehend information due to medical reason* and *Communication*, comprising two categories each (Fig. 1). The result indicated the main reason was that the patient was deemed unable to comprehend due to an acute or chronic medical condition impairing cognition: “Lowered consciousness” [Form number 657] and “Too tired” [Form number 2212].

Other reasons included practicalities such as language barriers, inappropriate setting for the discussion, or patient wish: “Not appropriate to do this at the emergency department in a stressful situation” [Form number 1161] and “Language barrier” [Form number 2807].

Patient’s attitude

Patient’s attitude towards the DNACPR order was stated in free text in 387 forms and content analysis of 78 forms resulted in two themes: *Patient’s preference* and *Patient’s attitude unknown*, comprising three and two categories respectively (Fig. 2). “Does not want cardiac

resuscitation in case of a cardiac arrest.” [Form number 989] and “The patient does absolutely not want care in a ventilator or other ‘heroic efforts’ at a cardiac arrest or deterioration . . . ” [Form number 1719].

Some patients expressed a wish for a natural death: “The patient does not wish for intensive care or any painful interventions. On acute deterioration, he wants nature to have its own way.” [Form number 3970] and “The patient brings up the question herself and says that she does not want the treatment as she has lived for a long time and there is a time for dying . . . ” [Form number 30].

Patients could also have a more accepting attitude towards the DNACPR order: “The patient does not have own wish to refrain from life sustaining treatment, but understands and accepts the decision that is based on medical grounds.” [Form number 3526]. The patient disagreed with the medical assessment in only one form.

Consultation with relatives (n=3583)

Consultation with relatives occurred in 26%, and relatives’ attitude towards the DNAR decision was documented in 15% (eTable 1). Content analysis of 108 documents yielded five categories showing that the most common situation was that the relatives agreed with the medical assessment to issue a DNACPR order (eTable 2): “Discussed with the son by telephone, the son agrees with the limitation of life sustaining treatment.” [Form number 1050].

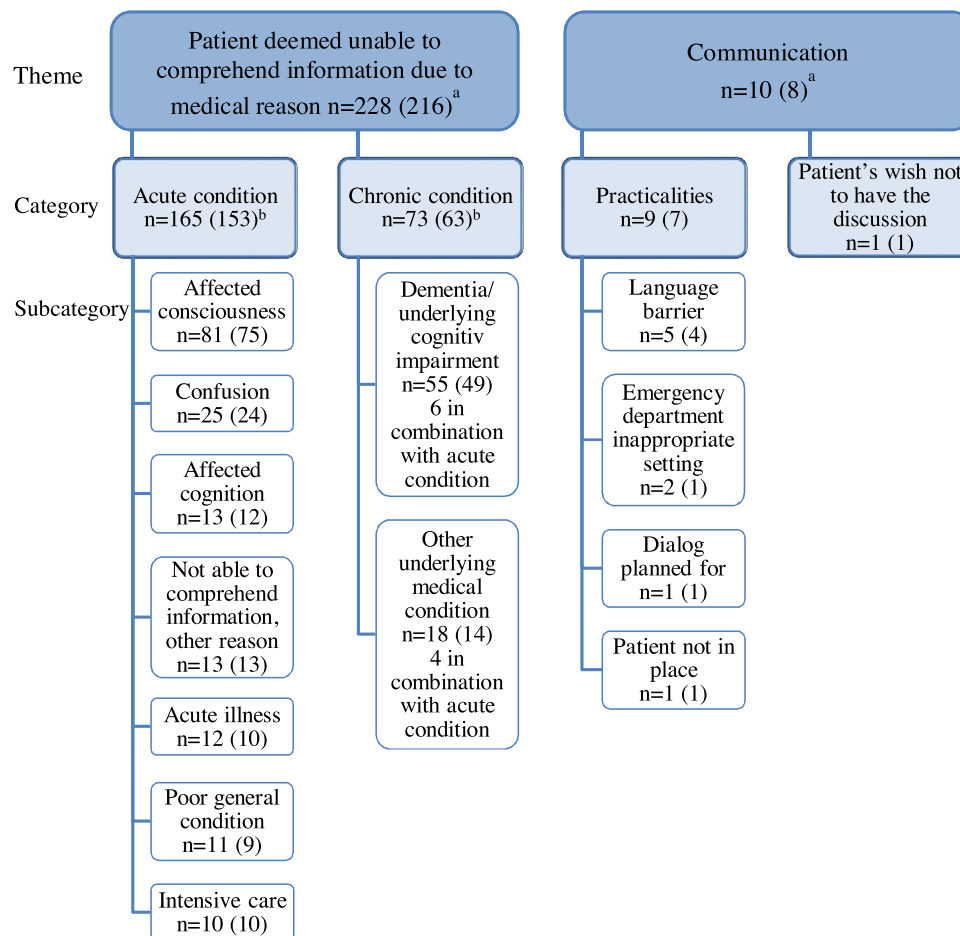


Fig. 1 – Reasons why consultation with the patient was not possible.

A random sample of 236 forms were analysed. One form was excluded due to missing information. ^aBrackets denote numbers that were exclusive. ^b10 in the categories Acute and Chronic condition were in combination.

The relatives could also wish for a DNACPR order: “Does not want the patient to be given CPR or ICU-care (Intensive Care Unit-care, authors’ comment)” [Form number 67], and express a respect for the patient’s wish to refrain from resuscitation: “Respects and agrees with the patient’s wish and the medical assessment.” [Form number 132].

The most common relatives to consult with were children and spouse (eTable 3).

Consultation with other licensed caregivers (n=3583)

Consultation with other licensed caregivers occurred in 36%, and 43% of the documents lacked information that patient, or relatives, or another licensed caregiver were consulted. Content analysis of 253 documents showed that the vast majority of consultations were with a physician followed by a nurse (eTable 4).

Grounds for the DNAR order (n=3583)

Prognosis of the medical condition constituted part of the grounds for issuing the DNACPR order in 87% of the decisions. The patient’s own wish to refrain from resuscitation was part of the grounds in 7% and was the sole ground for the DNAR order in 1%. Documentation of the grounds for the DNACPR order was in place in 89% of the forms.

Prognosis of the medical condition as grounds for the decision

Content analysis of free text for grounds for the decision of 466 forms resulted in seven categories (Fig. 3). It was most commonly based on *Chronic comorbidity in a severe state, Malignancy or Multimorbidity*

with or without the presence of an acute condition. Chronic comorbidity in a severe state and Malignancy with or without the presence of an acute condition dominated as exclusive categories. This could be expressed as: “Advanced MS (Multiple Sclerosis, authors’ comment).” [Form number 3915]; “Severe Alzheimer’s dementia, peripheral myopathy. Fracture of the left distal femur.” [Form number 1039] and “Gastric cancer, acute renal failure, STEMI (ST-Elevation Myocardial Infarction, authors’ comment)” [Form number 869].

Multimorbidity and frailty with or without the presence of an acute condition was common in combination with another category: “Woman with multimorbidity admitted with severe electrolyte disturbance. Poor general condition lately. Optimised medical treatment, despite this no improvement in five days. Currently the patient’s prognosis is pessimistic and CPR is considered ruthless.” [Form number 3083] and “Multimorbidity in combination with high age, therefore the patient is assessed not to gain from resuscitation in case of a cardiac arrest.” [Form number 833].

Although not frequently the sole ground for the decision, age was the most predominant subcategory to frailty.

Acute condition not combined with another category occurred quite frequently as the sole ground for the DNACPR decision: “Patient anuric for >24 hours with sepsis. Very poor prognosis” [Form number 3937].

Aspects of *poor prognosis in the event of a cardiac arrest* were phrased in different ways, such as the example above.

Adherence to the legislation

In summary, 375 forms (10%) fulfilled all requirements in the legislation, see Fig.4 and eTable 1 for details. In stratified analysis

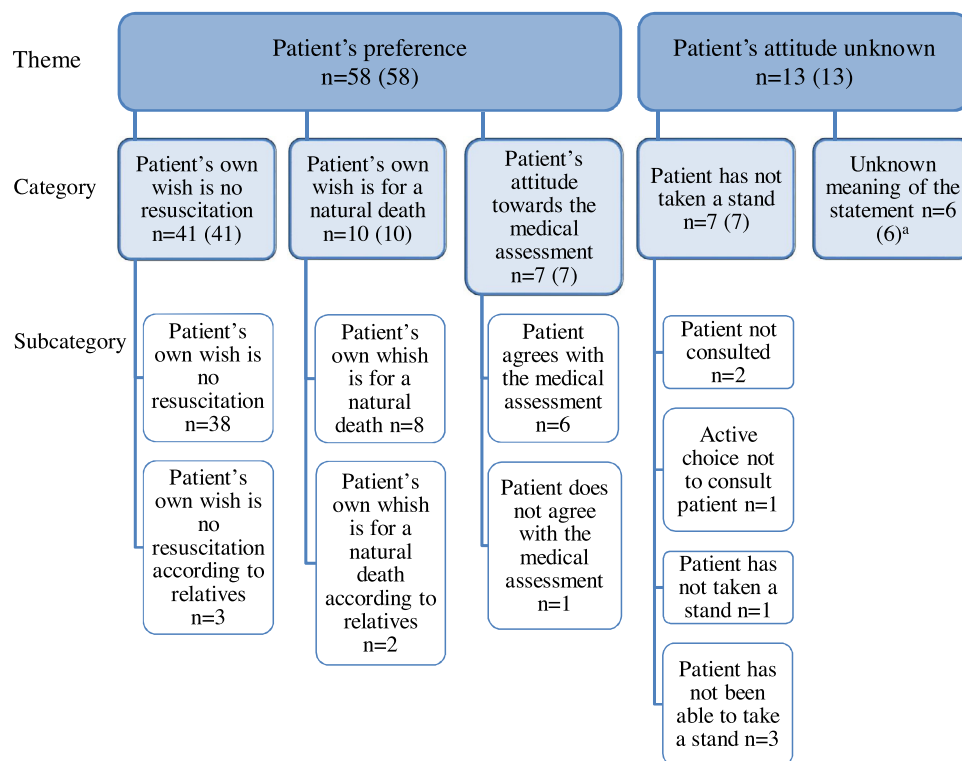


Fig. 2 – Patient’s attitude towards the Do-Not-Attempt-Cardiopulmonary-Resuscitation order. A random sample of 78 forms were analysed. Seven forms were excluded due to reference to the electronic patient journal. Brackets denote numbers that were exclusive. ^aReference to a previous consultation with unknown meaning.

this was not explained by lower fulfillment of the legislation in subsequent forms as compared to the first form during the admission (107/811; 13.2% and 249/2626; 9.5% respectively, p-value 0.002. 146 missing due to inconclusive status as the first form). Table 2 displays baseline characteristics for patients according to adherence to the legislation.

Discussion

This retrospective study showed that adherence to the Swedish legislation regarding DNACPR orders in a University Hospital was poor. In only 28% of patients seemingly available for consultation did the discussion take place, not noting that consultation was impossible for the rest. In the substantial proportion where consultation with the patient was not possible, it was due to the patient's impaired cognition. Often the patient can wish to refrain from resuscitation and relatives often show acceptance regarding DNACPR decisions. This study is original in that it assessed on a larger scale the actual clinical practice associated with DNACPR decisions.

How can this poor adherence to the legislation be understood?

This study confirms previous findings that DNACPR decisions are usually made by a senior physician.^{7,15,18,19,21} This seems appropriate as these decisions are complex, requiring information about the medical history and level of functioning, with uncertainties about the prognosis as well as the patient's wishes and values.^{7,18,19} Considering this, the finding that 43% of DNACPR decisions were made by the physician alone stands out. It also confirms previous findings that due to impaired cognition, shared decision making is not an option for many patients who receive a DNACPR order.^{7,10,14,19,22,23} Consultation with their relatives in this situation would respect patient autonomy and engage them in health care

planning. This took place in only half of these cases in this study. For the rest of the patients, shared decision making was low without stated reason. As one-year mortality was high in this cohort (77%), a thorough assessment of the patient's ability to participate in the DNACPR decision is urgent. Further, some of the reasons why consultation with the patient was not possible, such as language barrier, is not a legitimate reason for not including the patient. Although physicians seem to find it important to consult with patients and relatives,^{7,11,13,19,24} it has been expressed that it is unlikely to happen,¹³ and barriers have been identified as to why consultation does not take place.^{7,9,18,19} Part of the explanation could be that physicians fear that discussing DNACPR orders can cause conflicts, be harmful to the patient and take away hope.^{7,11,15,18,25} This has been contradicted, showing that patients in general are positive regarding the discussion.^{17,22,23,26–28} This study showed that according to physician notes, patients' dominating attitude was that it was their own wish to refrain from resuscitation and that it could be part of the process of natural death. As the patient very rarely disagreed, this study gives no support to the fear of conflict or cause of harm, and it is essential that this knowledge is conveyed to clinicians. However, the discussion must be individualised in terms of timing in relation to the course of the disease²⁴ and initiation of treatment,^{22,23} as well as incorporation into overall goals of care.²⁹ Although studies have shown that the majority of physicians at two Swedish hospitals had knowledge about the ethical guidelines for resuscitation,^{15,16} another part of the explanation for the poor total adherence could be that physicians may not be aware that it is in such detail regulated by law.¹⁶ Shortcomings in the decision making process in Sweden has been identified previously,^{13–16} and increasing adherence to the Swedish legislation is multifaceted. Introducing communication interventions to aid in resuscitation decisions,³⁰ incorporating DNAR decisions into broader treatment plans with overall goals of care,²⁹

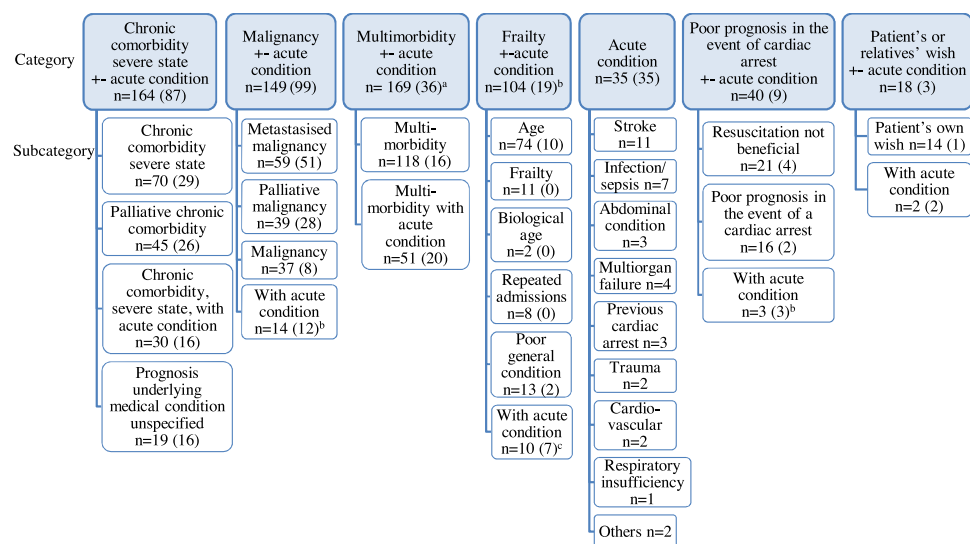


Fig. 3 – Prognosis of the medical condition as grounds for the Do-Not-Attempt-Cardiopulmonary-Resuscitation order. A random sample of 466 forms were analysed. Five forms were excluded due to reference to the electronic patient journal, and one due to misplaced text. Brackets denote numbers that were exclusive. ^aMultimorbidity was defined as the coexistence of two, or more chronic conditions or the word 'multimorbidity' used in the text. Due to the definition of multimorbidity the category multimorbidity ± acute condition was not exclusive, and could comprise the category chronic comorbidity severe state ± acute condition and/or malignancy ± acute condition. ^bSubcategories in Frailty ± acute condition were not exclusive. ^cIn combination with any of the above. In one third of the forms, grounds for issuing the DNACPR order was a combination of two or more categories.

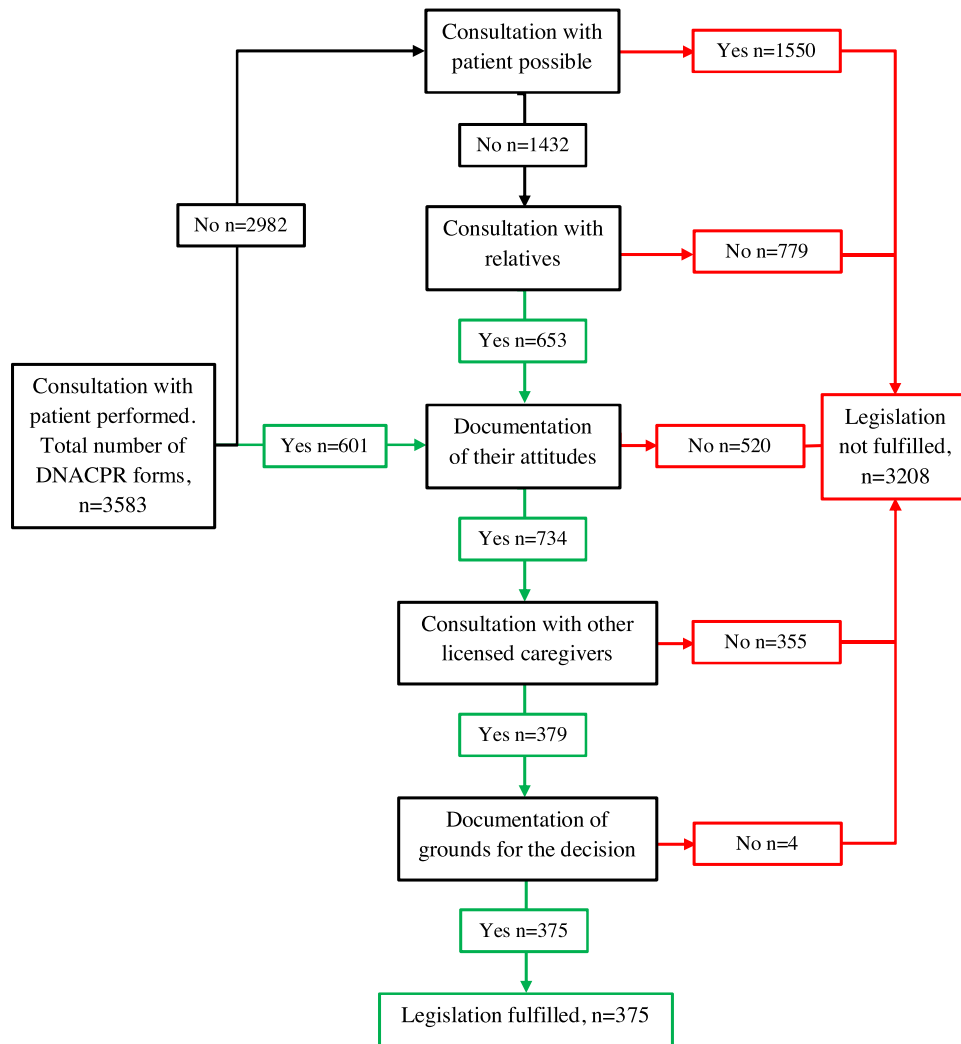


Fig. 4 – Adherence to the legislation regarding Do-Not-Attempt-Cardiopulmonary-Resuscitation orders. Abbreviations: DNACPR Do-not-Attempt-Cardiopulmonary-Resuscitation.

introducing adherence to the legislation as an indicator of hospital quality, and highlighting the legislation through clinical education¹⁶ could be part of the measures indicated to improve clinical practice regarding DNACPR orders. To aid in assessing outcome after in-hospital cardiac arrests, prearrest prediction tools have been developed and their role in clinical practice needs to be explored further.^{31,32}

This study has consolidated^{17,14,18} and provided detailed knowledge about the grounds for DNACPR orders, showing that the decision was mostly based on a chronic, severe comorbidity with or without an acute condition, followed by multimorbidity, acute condition alone and frailty. Frailty is a known risk factor for adverse outcome,^{33–36} and has gained increased attention in critical care. In line with previous findings that age is not independently associated with poor outcome after in-hospital cardiac arrest,^{37,38} age alone rarely constituted the grounds for DNACPR decisions. Patient quality of life has previously been reported as part of the grounds for DNACPR orders,^{7,13,18} but the term quality of life was rarely mentioned in this study. Words like “poor prognosis in the event of

cardiac arrest” or “resuscitation would not be beneficial to the patient” were used instead.

Strengths of this study include that it reflects actual clinical practice regarding DNACPR orders, and the attitudes of the patient and relatives at the time the decision was made. The sample size and the free text analysed was large. Through an independent coding procedure and by seeking agreement with senior researchers, we strived for high credibility. Internal hospital revision supports that adherence to filling out the form for each DNACPR order is high (personal communication TD, Medical Coordinator for the CPR organisation at KUH). This is in line with another Community Hospital in Sweden showing that 95% of patients who died without resuscitation had a DNACPR order.¹⁴ Limitations include that the cohort consisted of admissions through the ED, and elective admissions (approximately one third of admissions) were thus not included. According to our clinical experience, with support from a previous study,³⁹ elective admissions would less likely receive a DNACPR order, and considering the challenging process of extracting data from the hospital data warehouse and linkage with the NPR we

Table 2 – Baseline characteristics according to adherence to the legislation for Do-Not-Attempt-Cardiopulmonary-Resuscitation (DNACPR) orders for patients admitted to Karolinska University Hospital through the emergency department (ED) between 1st January and 31st October, 2015.

Admissions through the ED receiving a DNACPR order^a

	Adherence to the legislation Total number 259 ^c	No adherence to the legislation Total number 2439 ^c	P-value ^b
DNACPR orders issued during the period ^d	375	3208	
Unique patients	252	2080	
<i>Demographics</i>			
Male sex, No. (%)	120 (46.3)	1151 (47.2)	0.79
Age, mean (SD) y	80 (13)	77 (13)	<0.01
Median [IQR]	82 [74;89]	78 [69;87]	<0.01
Range	19,101	19,105	
<i>Comorbidity^e, No. (%)</i>			
Renal disease	52 (20.1)	316 (13)	<0.01
Hypertension	162 (62.6)	1319 (54.1)	<0.01
Chronic obstructive pulmonary disease	49 (18.9)	404 (16.6)	0.34
Congestive heart failure	110 (42.5)	691 (28.3)	<0.01
Diabetes	54 (20.9)	513 (21)	0.95
Dementia	51 (19.7)	340 (13.9)	0.01
Malignancy	70 (27)	1109 (45.5)	<0.01
<i>Charlson comorbidity index,</i>			
Median [IQR]	3 [2;5]	3 [2;6]	1.00
Range	0,12	0,14	
<i>Hospital admission characteristics</i>			
Admission ward (from ED)			
General ward	109 (42.1)	1223 (50.1)	reference
High dependency unit	130 (50.2)	1161 (47.6)	0.09
Intensive care unit	20 (7.7)	55 (2.3)	<0.01
Length of hospital stay,			
Median [IQR]	10 [3;19]	10 [4;21]	1.00
Range	0,67	0,186	
<i>Mortality</i>			
Hospital mortality, No. (%)	113 (43.6)	895 (36.7)	0.03
30-day mortality, No. (%)	114 (44)	908 (37.2)	0.03
1-year mortality, No. (%)	191 (73.7)	1894 (77.7)	0.15

^aIn total 25,635 admissions through the ED between 1st January and 31st October, 2015. ^bP-values contrast adherence with no adherence to the legislation regarding DNACPR orders assessed with the chi-squared test for binary variables, logistic regression for categorical variables, linear and quantile regression with bootstrap for continuous variables. ^cBaseline characteristics are presented according to adherence to legislation based on the first DNACPR form that was issued during the admission. ^d1971 patients received 1 DNACPR order, 591 patients received 2 DNACPR orders, 118 received 3 DNACPR orders, 15 received 4 DNACPR orders, 2 received 5 DNACPR orders and 1 received 6 DNACPR orders during their hospital stay. ^eBefore admission according to the International Statistical Classification of Diseases-10 in the National Patient Register.

chose to be pragmatic in using a cohort with complete pre-collected data. Although the DNACPR forms get us close to clinical practice, consultation could have taken place without documentation. Transferability might be limited as the survey was conducted at a single University Hospital during 2015. Furthermore, there could be lack of representativeness regarding patients' and relatives' attitudes since the proportion of free text available was low, potentially introducing a selection bias in the documentation of attitudes.

Conclusion

In 90% of the cases, physicians failed to fulfil all requirements in the Swedish legislation regarding DNAR orders. The decision was mostly based on chronic, severe comorbidity or multimorbidity. The dominating patient attitude was to wish to refrain from resuscitation.

Conflicts of interest

No disclosures for all authors.

CRedit authorship contribution statement

Eva Piscator: Study concept and design, Acquisition of data, Analysis and interpretation of data, Drafting of the manuscript, Critical revision of the manuscript for important intellectual content, Statistical analyses, Administrative, technical, or material support. **Therese Djärv:** Study concept and design, Acquisition of data, Analysis and interpretation of data, Drafting of the manuscript, Critical revision of the manuscript for important intellectual content, Statistical analyses, Obtaining funding, Administrative, technical, or material support, Study supervision. **Katarina Rakovic:** Study concept and design,

Acquisition of data, Analysis and interpretation of data, Drafting of the manuscript, Critical revision of the manuscript for important intellectual content. **Emil Boström**: Study concept and design, Acquisition of data, Analysis and interpretation of data, Drafting of the manuscript, Critical revision of the manuscript for important intellectual content. **Sune Forsberg**: Study concept and design, Analysis and interpretation of data, Drafting of the manuscript, Critical revision of the manuscript for important intellectual content, Study supervision. **Martin J. Holzmans**: Study concept and design, Acquisition of data, Critical revision of the manuscript for important intellectual content. **Johan Herlitz**: Study concept and design, Analysis and interpretation of data, Drafting of the manuscript, Critical revision of the manuscript for important intellectual content, Study supervision. **Katarina Göransson**: Study concept and design, Acquisition of data, Analysis and interpretation of data, Drafting of the manuscript, Critical revision of the manuscript for important intellectual content, Statistical analyses, Study supervision.

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Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:<https://doi.org/10.1016/j.resplu.2021.100128>.

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