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Published in:
Resuscitation

Publication status and date:
Published: 01/01/2020

DOI (link to publisher):
10.1016/j.resuscitation.2020.04.004

Document Version
Publisher's PDF, also known as Version of record

Available online at www.sciencedirect.com
Resuscitation
journal homepage: www.elsevier.com/locate/resuscitation

Clinical paper

A cross-sectional investigation of communication in Do-Not-Resuscitate orders in Dutch hospitals

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Abstract

Background: The decision to attempt or refrain from resuscitation is preferably based on prognostic factors for outcome and subsequently communicated with patients. Both patients and physicians consider good communication important, however little is known about patient involvement in and understanding of cardiopulmonary resuscitation (CPR) directives.

Aim: To determine the prevalence of Do Not Resuscitate (DNR)-orders, to describe recollection of CPR-directive conversations and factors associated with patient recollection and understanding.

Methods: This was a two-week nationwide multicentre cross-sectional observational study using a study-specific survey. The study population consisted of patients admitted to non-monitored wards in 13 hospitals. Data were collected from the electronic medical record (EMR) concerning CPR-directive, comorbidity and at-home medication. Patients reported their perception and expectations about CPR-counselling through a questionnaire.

Results: A total of 1136 patients completed the questionnaire. Patients' CPR-directives were documented in the EMR as follows: 63.7% full code, 27.5% DNR and in 8.8% no directive was documented. DNR was most often documented for patients >80 years (66.4%) and in patients using >10 medications (45.3%). Overall, 55.8% of patients recalled having had a conversation about their CPR-directive and 48.1% patients reported the same CPR-directive as the EMR. Most patients had a good experience with the CPR-directive conversation in general (66.1%), as well as its timing (84%) and location (94%) specifically.

Conclusions: The average DNR-prevalence is 27.5%. Correct understanding of their CPR-directive is lowest in patients aged ≥80 years and multimorbid patients. CPR-directive counselling should focus more on patient involvement and their correct understanding.

Keywords: DNR, CPR-directive, Do-Not-Resuscitate, Decision-making, Patient survey

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https://doi.org/10.1016/j.resuscitation.2020.04.004
Received 12 November 2019; Received in revised form 30 March 2020; Accepted 2 April 2020
Available online xxx

Introduction

Cardiopulmonary resuscitation (CPR) for in-hospital cardiac arrest has a low one-year survival rate of 13% (95% CI: 11%−15%).[1] The decision to attempt or refrain from CPR is preferably based on prognostic factors for outcome and established through shared decision-making.[2−5] Although patients and physicians consider good communication on this subject to be important, this is not always achieved.[6] Evidence concerning optimal timing, location of and specific communication strategies is lacking.[7] Experts stress that decisions should be patient-centred and that CPR-directives should be part of discussions regarding future care planning.[8,7]

Communication between patients and physicians seems suboptimal while most patients want to be actively involved in decision-making with regard to CPR.[9−11] Two decades of British newspaper coverage on the subject largely pertains to miscommunication and insufficient information given by physicians, sometimes even leading to legal cases.[4] Patients have limited knowledge about cardiac arrest and they tend to overestimate the probability of survival after CPR.[12] Moreover, DNR-orders are often mistaken for withdrawal of treatment, euthanasia or thought subject to ageism.[4,10,13,14,8]

An international survey on CPR-directive practices reported large heterogeneity in approaches due to differing cultures and economic status.[15] The majority of respondents indicated national guidance on CPR-counselling is warranted, but currently often lacking. Although CPR is not specifically mentioned in Dutch legislation, it is stipulated that patients are informed and provide consent for any proposed treatment.[16] A national guideline on discussing DNR in frail elderly patients is available for general practitioners; no such guideline exists for hospital care.[17] It is proposed that the Dutch "open culture" facilitates CPR-counselling.[15] Still, the most recent Dutch study (2005) reported that 90% of patient files lacked a CPR-directive.[18] Literature on DNR prevalence and patient perception is scarce. To achieve better patient counselling and to implement the right communication interventions, we must identify which patients need information, when they should receive it and how much is remembered.[19] The objective of this study was to provide an examination of patients' perceptions of CPR-directive counselling. The primary aim was to assess the prevalence of DNR-orders. The secondary aims were to establish how many patients recollected a conversation about a CPR-directive, what CPR-directive the patients then reported and if this was in agreement with the electronic medical record. Furthermore patients were asked about their experiences with the conversation and expectations towards survival rates after IHCA. Lastly an association between the aforementioned outcomes and patients' age, morbidity, familiarity with CPR and type of admission was assessed.

Methods

Study design

A nationwide multicentre cross-sectional observational study was conducted in 13 participating hospitals. We used a group of people to interview patients present at each location at one day. In this case the group of people consisted of our local investigators and student team, and the locations were hospital sites. This has been used in similar previous investigations.[20] Participating hospitals were recruited from the 19 hospitals participating in a study assessing long-term outcomes of in-hospital cardiac in the Netherlands.[21] The current study was registered at clinicaltrials.gov (NCT03807206). A structured questionnaire was created through focus group sessions with anaesthetists, intensivists, internists, a nursing scientist, an epidemiologist, a clinical ethicist, and a linguistic consultant. The questionnaire was assessed for legibility, clinimetric value and was pilot-tested to assess readability.

Patient population

The study population consisted of all adult hospitalized patients who were at risk for suffering in-hospital cardiac arrest and who were able to provide informed consent for the study. As mentioned there is no protocol for CPR-directive conversations. In our clinical experience patients who are admitted to the ward or who are scheduled for surgery have a CPR-directive entered in the electronic medical record. No guideline or protocol exists dictating this be discussed with the patient. We excluded patients from the intensive/cardiac/stroke care unit, because most patients are not able to provide consent or answer the questions. We excluded patients from day treatment centres (e.g. day-care surgery, outpatient dialysis), because their hospital stay is very short, and patients with cognitive impairment or a language barrier without interpreter available. Furthermore we excluded patients from the emergency room, because they were likely not have spoken to a physician prior to our survey and participation would be too strenuous. To protect our students patients with contagious disease (influenza, norovirus) were excluded. Cognitive impairment was generally defined as a Cognitive Performance Category (CPC) score $\geq$4 or CPC 3 and unable to provide consent.[22] Cases were reviewed by local investigators. If patients or nursing staff refused participation, the reason was noted anonymously.

Ethical considerations

Study participants provided consent for participation in the study and were given the possibility to opt-out. The study protocol was considered not to be subject to the Dutch Medical Research in Human Subjects Act (WMO) due to its non-interventional design. This study was registered as MEC 2018−1344 with the Erasmus University Medical Centre Medical Ethics Committee.

Data collection

Data were collected between January 21st 2019 and February 7th 2019. Each hospital location was visited for one day from 09:30am to 6:00pm, leading to 13 planned data collection days. Each hospital had been informed about the planned data collection date beforehand. On the day itself, the principal investigator (MS) and local investigators informed the ward nurses and the head nurse was asked to provide a list of patients who met the exclusion criteria. All eligible patients were asked to participate in the study. After providing consent, the patient completed a structured questionnaire on a tablet computer, aided by a student if necessary. These students had medical, nursing or psychology backgrounds and were instructed to obtain consent and help with the questionnaire. Students were instructed how to clarify questions to avoid misclassification bias.

Outcome measures

Demographic data were collected via the questionnaire, including the nature of the hospital stay and health-related quality of life using the

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EuroQoL descriptive system with 5 health dimensions and 3 response levels (EQ-5D-3L).[23] Secondly patients were asked if a CPR-directive had been discussed with them. They were asked how they experienced timing and location of this conversation and what they thought their CPR-directive was. Lastly, they were asked to estimate the one-year survival probability of CPR for in-hospital cardiac arrest (0−100%). A researcher, blinded from the interview, collected the following data from the electronic medical record (EMR): CPR-directive, Charlson Comorbidity Index diseases[24] and number of medications used at home (excluding food supplements and lotions). The CPR-directive from the EMR was divided into three categories: full code (FC), do not attempt cardiopulmonary resuscitation (DNR) and not documented (ND). Patient responses yielded two more categories: code unknown to patient (CU) or not discussed with the patient (NDP). The data were pseudonymized. The translated questionnaire and case report forms are provided in Supplement 1.

Open answers with regard to patient experiences were categorized by the investigators (TR, SIJ, MS) into four categories: positive, neutral, negative and self-determined. Finding it useful or appreciating having had a CPR-directive conversation was coded as 'positive'; having thought about a CPR-directive beforehand and expressing this thought was coded as 'self-determined'. With regard to timing and location of the conversation patients responded on a two or three point Likert-scale. We compared the CPR-directives from the EMR with patient recall of having a CPR-directive conversation and whether patients were aware of their CPR-directive (patient understanding). Correct patient understanding was assessed for patients who had a documented CPR directive. Correct understanding consisted of: (1) recollection of having spoken to a health care professional about the CPR-directive, and (2) reporting the same directive as documented in the EMR.

Statistical analysis

Descriptive statistics were used accordingly. Subgroup analyses were done for pre-specified subgroups on the basis of (1) age (per decade), (2) Age-Combined Charlson comorbidity Index (ACCI),[24] (3) number

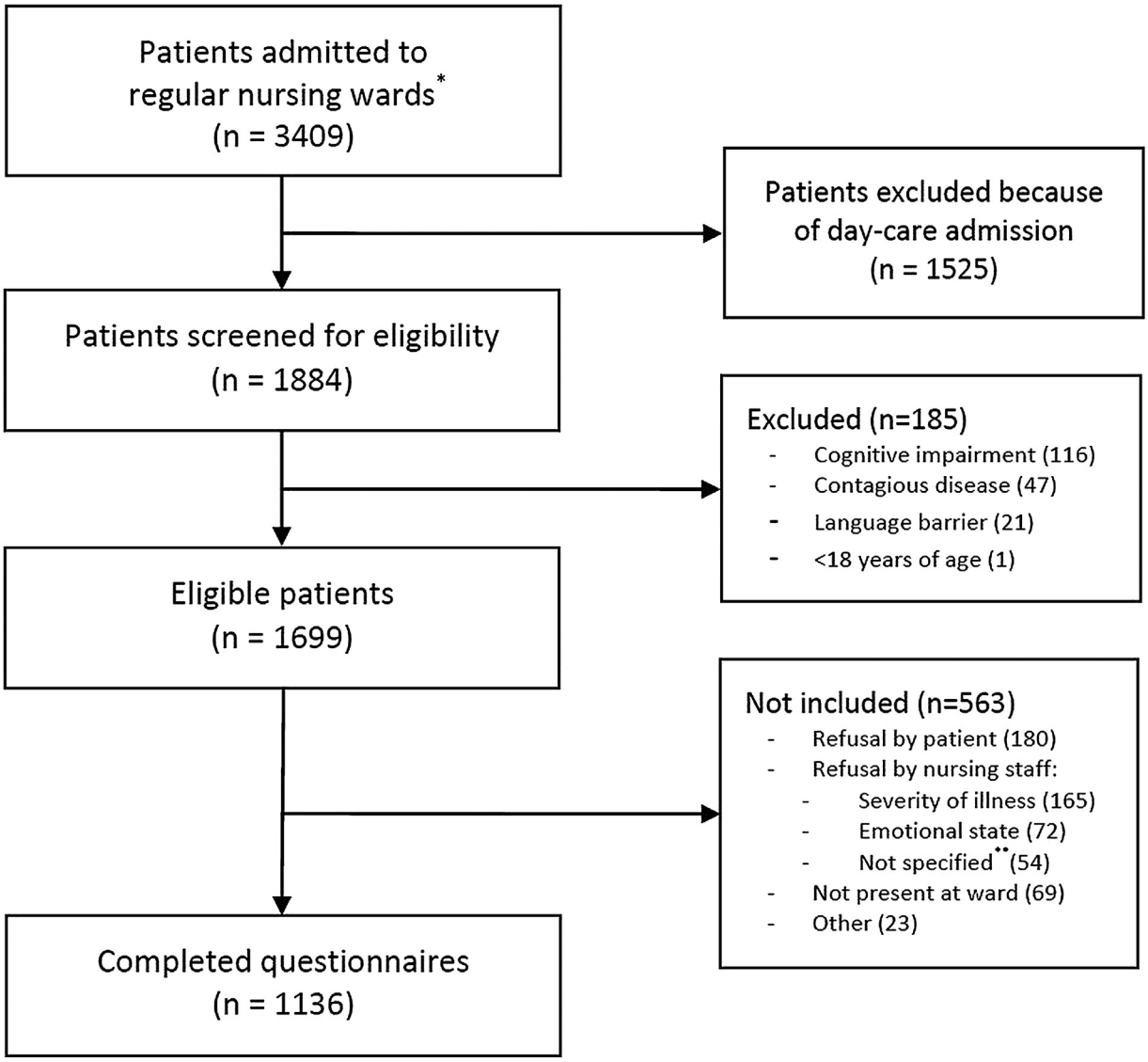

Fig. 1 – Study flow diagram. *Not including: intensive and critical care units, emergency and operating rooms, obstetrics, paediatrics, outpatient haemodialysis; **Nurses reserved the right to refuse access to patients if they felt these could not participate.

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of medications used at home (as a proxy of chronic illness),[25] (4) familiarity with CPR and (5) being a CPR-survivor and (6) admission specialty. For the Charlson comorbidity index (CCI) a cut-off point of 7 points was chosen as it is associated with reduced outcome in several cohorts.[24] Also an ACCI was stratified for low (0−4 points), medium (5−7 points) or high (8+ points) burden of age and disease. A high score was previously associated with lower survival.[26,27] Data were analyzed using SPSS statistics v25.0 (IBM, Chicago, IL, USA) and R. (R Foundation for Statistical Computing, Vienna, Austria).

Results

Thirteen hospitals were visited. In total 3409 patients were present in the nursing wards, subsequently 1884 patients were screened for eligibility, 1699 patients were eligible for inclusion and 1136 patients completed the questionnaire. This yields a response rate of 67.0%. The flowchart for inclusion is summarized in Fig. 1. Included patients had a median age of 70 years (IQR 59−78), half of the population was male and most were born with the Dutch nationality (87.0%). Patient characteristics are shown in Table 1.

CPR-directives and patient recollection

The CPR-directives from the Electronic Medical Record (EMR) for the included 1136 patients were distributed as follows: 63.7% full code (FC), 27.5% do not attempt resuscitation (DNR) and 8.8% not documented. The distribution of CPR-directives and patient recollection is depicted in Fig. 2. Of all questioned patients, 634/1136 (55.8%) recalled a conversation regarding a CPR-directive. Of patients with a full code, 384/724 (53.0%) recalled speaking to a health care professional, of patients with a DNR-order this was 228/312 (73.1%) ($p < 0.001$). Of patients with a documented CPR-directive of either FC or DNR 499/1036 (48.1%) reported knowing their status and reported it in accordance with the EMR. For patients with FC this result was 330/724 (45.6%) and for patients with DNR 169/312 (54.2%) ($p = 0.01$). For 81/1136 (7.0%) patients the directive they mentioned was not the one registered in the EMR.

Subgroup analyses

Results on subgroups were stratified by (1) DNR-prevalence according to the EMR, (2) CPR-directive conversation patient recall and (3) correct patient understanding. Results are shown in Table 2. While none of the patients below 40 years had a DNR-status, the proportion of patients with a DNR-status increased to 66.4% in over 80-year-olds ($p < 0.001$). For the Age-Combined Charlson Comorbidity Index (ACCI) a major increase was seen in DNR-prevalence for ≥5 points (49.6%) compared to lower scores (13.4%) ($p < 0.001$). The DNR-prevalence increased with the number of medications used at home from 7.2% (zero medications) to 45.3% (≥10 medications) ($p < 0.001$). DNR-prevalence was higher in cancer patients (37.3%) than in non-cancer patients (24.2%) ($p < 0.001$).

CPR-directive conversation recall

In total 634/1136 (55.8%) recalled a CPR-directive conversation. Recall was 28.4% for patients ≤39 years, 50.1% for 40−64 years, 58.9% for 65−79 years and 65.9% in patients ≥80 years old ($p < 0.001$). Patients using less versus ≥10 medications had a recall percentage of 53.2% and 68.9% ($p < 0.001$) respectively. Inversely a lower correct understanding was seen in patients using more medications from 73.3% (≥10 medications) vs. 83.8% (≤9 medications) ($p = 0.006$).

Table 1 – Characteristics of the patient population (n = 1136). IQR, interquartile range; SD, standard deviation; EQ-5D, EuroQol 5 dimension questionnaire; CPR, cardiopulmonary resuscitation.

Characteristics[a]	
Age (median, IQR)	70 (59−78)
Sex, male	567 (49.9)
Admission specialty	
Medical	449 (39.5)
General surgery	217 (19.1)
Cardiology/cardiac surgery	193 (17.0)
Neurology/neurosurgery	101 (8.9)
Other surgical specialties	176 (15.5)
Born nationality	
Dutch	989 (87.0)
of which second generation immigrant	*75 (6.5)*
Surinam	40 (3.5)
Moroccan	12 (1.1)
Turkish	9 (0.8)
Other	86 (7.6)
Religion	
None	560 (49.3)
Christian	406 (35.7)
Islamic	44 (3.9)
Other	126 (11.0)
Level of education	
Primary school or none	170 (15.0)
Secondary school−prevocational	275 (24.2)
Secondary school−higher level	75 (6.6)
Vocational education	337 (29.7)
Univ. of applied sciences	215 (18.9)
University	64 (5.6)
Charlson Comorbidity index (median, IQR)	1 (0−2)
Number medications used at home	
None	139 (12.2)
1−5	476 (41.9)
6−9	331 (29.1)
>10	190 (16.7)
EQ-5D self-reported health state (mean, SD)[b]	62.1 (18.8)
Familiar with CPR?	
Yes, witnessed in the street or at home	163 (14.3)
Yes, witnessed in-hospital	64 (5.6)
Seen on TV or internet	332 (29.2)
No	456 (40.1)
Did not respond	121 (10.6)
CPR-survivor	54 (4.8)
Estimated one-year survival in %; (med, IQR)	55 (40−75)
How was your reaction to the CPR-directive conversation?[c]	
Positive	219 (34.4)
Neutral	103 (16.3)
Negative	159 (25.0)
Self-determined[d]	98 (15.4)
No response entered	57 (8.9)

[a] All values are displayed as (n, %), unless otherwise specified.
[b] Ranges from 0 (worst imaginable health) to 100 (best imaginable health).
[c] Patients were only able to reply if a CPR-directive conversation had taken place (n = 636).
[d] Self-determined means patients had already thought about their status prior to the conversation and felt confident and/or prepared for this conversation.

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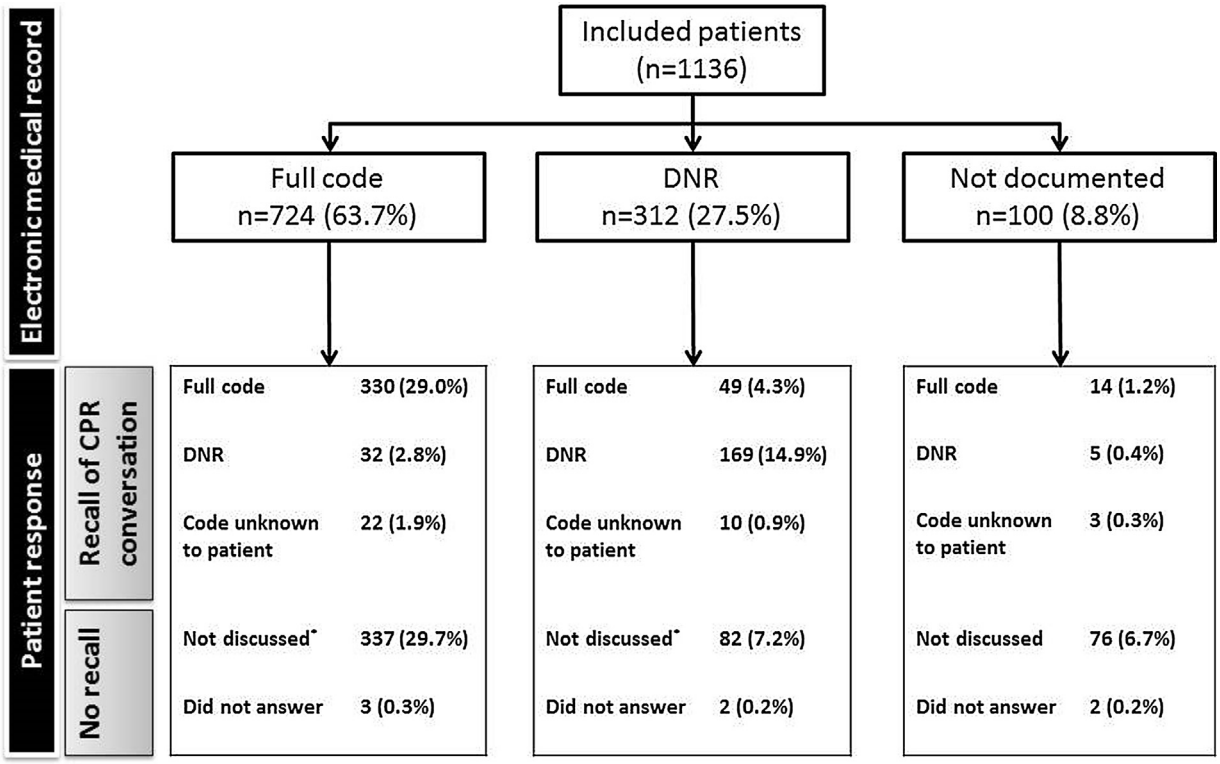

Fig. 2 – CPR-status prevalence, patients' recall of a conversation and the CPR-status patients recollected. *In two patients, a CPR-directive was not discussed at their own request FC ($n = 1$) and DNR ($n = 1$).

Patients' experiences with CPR-directive conversations

With regard to patient experiences patients were asked to provide an open answer. Most patients were positive (34.4%), neutral (16.3%) or self-determined (15.4%) about the CPR-directive conversation (Table 1). Of the 25.0% of patients who had a negative reaction about the conversation, the majority was overwhelmed or aghast, whereas the rest found themselves unprepared to answer the question at that time. When specified for location and timing on a Likert-scale, 84% was positive about the timing and 94% was positive or neutral about the location. This is displayed in more detail in Fig. 3 and Supplemental Fig. 2. Patients reported fewer negative experiences on average if the CPR-directive conversation had taken place in the outpatient clinic or at home (1.7%) compared to the ER or ward (7.4%) ($p = 0.016$). No major differences were observed for the predefined subgroups (Supplemental Fig. 3). The one-year survival rate after CPR for in-hospital cardiac arrest was estimated at a median of 55% (IQR 40–75%. When stratified for patient-reported CPR-status estimated survival was lowest in the DNR (median 50.0%, IQR 30.0–62.5%) and CU group (median 50.0%, IQR 30.0–80.0), followed by NDP (median 57.5%, IQR 41.3–80.0%) and FC (median 60.0%, IQR 50.0–80.0%) ($p < 0.001$). No significant differences in survival estimation were found between patients who were or were not familiar with CPR or between age groups.

Discussion

Of the hospitalized patients included in this study 27.5% had a DNR-order. Of all patients who participated in the study 55.8% recalled speaking to a health care professional about their CPR-directive. The prevalence of DNR-status increased with age and with the number of medications used at home. The prevalence of DNR also increased with a higher Age-Combined Charlson comorbidity Index (ACCI). The most striking discrepancy we found was that 7.0% of patients recalled a different CPR-directive than the one in the EMR.

In our study a CPR-directive was documented in 91.2% of medical records versus 9.8% in a Dutch single centre study from 2005.[18] DNR-prevalence in our study is higher than reported previously. Two studies from the USA reported a 15% DNR-prevalence among trauma patients and 11.7% prevalence in an intensive care setting.[28,29] DNR-orders were more prevalent in patients aged >80 years, with an ACCI >5 points or using >10 medications at home. A higher ACCI has been previously associated with poor outcome.[26,27] In a previous meta-analysis on this subject age was associated with a higher prevalence of DNR, however other important factors that might have affected DNR decisions, such as patients' premorbid status, functional status, and probability of survival were not uniformly included in all studies.[30] The authors did suggest these factors could influence DNR-decisions. The present study confirms the influence of age and severity of illness (by ACCI and use of medications).

Patients estimated one-year survival after IHCA 2.5 times higher than the actual survival rate found in our retrospective study and meta-analysis.[1,26] Patients with a FC have higher expectations of CPR survival in our study, as opposed to patient with other codes. This is in line with findings from a questionnaire in patients (admitted to medical wards) from the USA.[31] No association was observed between the expected survival rate after IHCA and patient's own experience, TV or Internet exposure, nor with age, comorbidity or the number of used

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Table 2 – Subgroup analysis of DNR-prevalence, code status/CPR conversation recall and correct patient understanding. Pre-specified subgroups were used. DNR, Do Not Resuscitate; EMR, Electronic Medical Record; Other surgical specialties, e.g. orthopaedics, plastic surgery, otorhinolaryngology.

Subgroup *n*/*group n (%)*	*n*	DNR-prevalence in EMR		CPR conversation patient recall		Correct patient understanding[a]	
All patients	1136	**312**/1136	(27.5)	**634**/1136	(55.8)	**499**/612	(81.5)
Age							
Young adults (18–39)	67	**0**/67	(0)	**19**/67	(28.4)	**16**/18	(88.9)
Older adults (40–64)	349	**51**/349	(14.6)	**175**/349	(50.1)	**141**/170	(82.9)
Seniors (65–79)	494	**111**/494	(22.5)	**291**/494	(58.9)	**232**/282	(82.3)
Elderly (≥80)	226	**150**/226	(66.4)	**149**/226	(65.9)	**110**/142	(77.5)
Charlson Comorbidity Index (CCI)							
0–6 points	1089	**289**/1089	(26.5)	**605**/1089	(55.6)	**479**/583	(82.2)
≥7 points	47	**23**/47	(48.9)	**29**/47	(61.7)	**20**/29	(69.0)
Age-Combined Charlson Index (ACCI)							
0–4 points	695	**93**/695	(13.4)	**342**/695	(49.2)	**275**/325	(84.6)
5–7 points	313	**149**/313	(47.6)	**208**/313	(66.5)	**160**/204	(78.4)
8+ points	128	**70**/128	(54.7)	**84**/128	(65.6)	**64**/83	(77.1)
Number of medications used at home							
0	139	**10**/139	(7.2)	**61**/139	(43.9)	**49**/57	(86.0)
1–5	476	**102**/476	(21.4)	**246**/476	(51.7)	**191**/229	(83.4)
6–9	331	**114**/331	(34.4)	**196**/331	(59.2)	**163**/195	(83.6)
≥10	190	**86**/190	(45.3)	**131**/190	(68.9)	**96**/131	(73.3)
Familiarity with CPR[b]							
No	456	**293**/456	(29.8)	**254**/456	(55.7)	**202**/246	(82.1)
Yes, seen in real life	227	**41**/227	(18.1)	**125**/227	(55.1)	**96**/118	(81.4)
Yes, seen on TV or internet	332	**95**/332	(28.6)	**189**/332	(56.9)	**145**/185	(78.4)
CPR-survivor							
No	1082	**293**/1082	(27.1)	**603**/1082	(55.7)	**475**/581	(81.8)
Yes	54	**19**/54	(35.2)	**31**/54	(57.4)	**23**/30	(76.7)
Admission specialty							
Internal medicine	449	**171**/449	(38.1)	**269**/449	(39.6)	**208**/262	(79.4)
General surgery	217	**37**/217	(17.1)	**105**/217	(51.2)	**79**/100	(79.0)
Cardiology/cardiac surgery	193	**55**/193	(28.5)	**123**/193	(63.8)	**104**/121	(86.0)
Neurology/neurosurgery	101	**27**/101	(26.7)	**53**/101	(47.5)	**39**/51	(76.5)
Other surgical specialties	176	**27**/176	(15.3)	**84**/176	(47.7)	**67**/76	(88.2)

[a] Only applies if patients recalled a CPR-directive conversation. Correct patient understanding means that if the EMR reads "Full Code", the patients provided the same answer, idem for other directives. Patients with recollection, but no documented directive were excluded ($n = 22$).
[b] Patients who did not answer this specific question were left out of analysis ($n = 121$).

medications. This implies there is room for better education on the prognosis of cardiopulmonary resuscitation.

To understand the discrepancies we found between documented CPR-directive and patients recollection, we must consider the possible situations in which patients are admitted to hospital. The first would be elective admission through the outpatient clinic (mostly surgical), in which the CPR-directive is documented in the outpatient clinic and may not be communicated with the patients. Reasons for not doing this may be that there is little time do discuss all aspects of surgery/treatment and the goal of the admission is full curation. Most patients will have a full code documented. Moreover, even if the CPR-directive was discussed, patients could have forgotten by the time they are admitted. The second possible situation is unplanned admission, in which patients may not always receive adequate information because of the emergency setting; meaning they are (considered) to sick to discuss this information with, or because of their severity of disease they cannot recollect later on. Lastly the situation remains that patients have a prior documented CPR-directive and this status is not confirmed or altered when patients are admitted on a next occasion. In this study we could not pinpoint the exact scenarios, as recollection was similar throughout admission types. We therefore think the discrepancies in recollection are surely in part attributable to admission type, however even more so to patients' characteristics.

The cross-sectional research design of collecting data one day per site, using a group of students, is a useful method for assessing point prevalence and gathering information in a short period of time. The response rate the study was 67.0%, which is relatively high.[32] Furthermore the reasons for non-inclusion were clearly described (Fig. 1). Our study can be considered representative of Dutch society with regard to ethnicity, educational level and religious background.[33–35] With regard to representation of the Dutch health care system our sample contained 1 (out of 8) academic hospital, 8 (out of 37) large regional hospitals and 4 (out of 57) small or rural hospitals. Although this study pertains to the Dutch medical system, we consider our results to be applicable to a broad range of Western countries.

Limitations

Certain limitations should be taken into account. Firstly we have only assessed data at one day per hospital, and numbers can change throughout the year. Our study design has however enabled us to collect a large amount of data in a short period of time. Secondly inclusion was limited by patients who were not able to participate, i.e. cognitively impaired or severely ill, whereas these patients are of special interest for our research objectives. We encountered this limitation because these patients could not provide informed consent.

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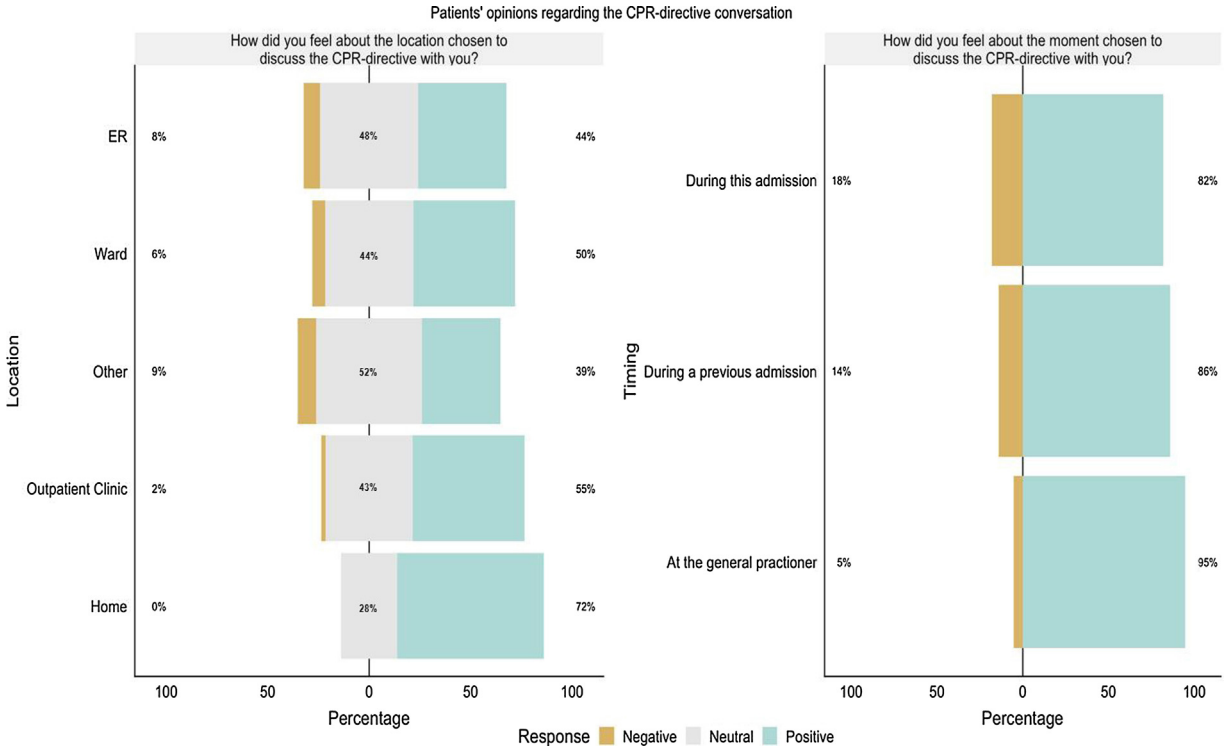

Fig. 3 – Patients' opinions regarding the CPR-directive conversation with regard to location ($n = 622$) or timing ($n = 631$) of the conversation, specified for the specific location or moment that it was discussed. *Other locations were: day-care clinic, pre-admission clinic or in-hospital not otherwise specified.

We consider this effect to be negligible because these cases were specifically reviewed in each hospital and therefore the number of exclusions on these grounds is low. These exclusions might lead to a slight underestimation of the DNR-prevalence, as perhaps the sickest patients were not included. Due to privacy legislation we do not have specific data regarding age or morbidity of the non-included patients. Moreover misclassification bias could exist as we did not use a validated questionnaire. We hope this effect has been minimized by expert-review and pilot-testing of the questionnaire and by having trained students present at the interview. The third possible limitation is bias by refusal of 5/18 hospital organizations to participate in this study. We expect bias to be minimal due to a large sample size and the distribution in hospital types, sizes and patient characteristics. The distribution of codes was different between hospitals. We did not have sufficient data however to explain this finding, as it was not in our primary aims. Lastly, we did not enrol patients from outpatient clinics, intensive care and palliative care units. This might have resulted in an underestimation of the incidence of DNR orders.

The majority of patients stated they recalled a conversation about their CPR-directive. However specific subgroups might warrant more attention for better understanding, as 7.0% of patients mentioned another directive than was registered in the EMR. This situation should be avoided at all cost. Patients were generally not opposed to discussing CPR-directives and were more than willing to answer questions on the subject. The low CPR-directive conversation recall in young patients might be due to this group being generally healthy and therefore by default CPR will be attempted. Growing application of e-health might prove useful, as this group is apt to be informed via multimedia and if necessary a longer conversation may follow.[36,37] For patients who are prone to forget what had been decided, repetition of this conversation or a longer first CPR-directive conversation could aid in recollection and understanding.[19]

Resuscitation policy should be tailored to the patients' situation and patients should be aware of their CPR-directive. We should speak to our patients about what is important to them and what limitations modern medicine has. Initiatives such as the recommended summary plan for emergency care and treatment (ReSPECT) from the UK gives patients and physicians the possibility to talk about advanced directives. This way many misunderstandings can be avoided.[4,38] DNR-orders can become a part of advanced care planning and emergency care treatment plans.[7] We support recommendations for national guidelines and training of CPR-counselling to help physicians guide their patients in shared decision-making.[8] As mentioned there is no protocol for CPR-directive conversations. In most hospitals it is common practice to enter this in the EMR upon admission to the ward. How often this is just an administrative task, rather than a conscious decision is not clear. The current study gives rise to the suggestion that in young and healthy patients it is mostly administrative. We envision three possible scenarios for CPR-counselling. First: CPR is likely to be successful, and CPR will be attempted in case of IHCA if the patient agrees to this. Second: no clear prediction can be made, in which case the decision will be made based on the best available evidence and in agreement with the patient. Third: the potential burdens of CPR outweigh the benefits, the patient should be informed of these burdens and a DNR order is discussed with the patient. In all three scenarios the focus should be lay on the benefits and shared decision-making.[38]

We conclude from this study that patients should be more involved in CPR-counselling and physicians should focus on correct patient

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understanding of the directive that will be documented. In this process physicians should pay attention to patient understanding in specific subgroups, such as elderly and multimorbid patients. We propose that the emphasis in future research lay on finding optimal timing for CPR-counselling and possible incorporation in early advanced directive conversations.

Funding

This study was funded by departmental funds and by an unrestricted research grant from the European Society of Anaesthesiology (Brussels, Belgium) & Air Liquide (Paris, France). The funding sources had no role in study design, data collection, analysis of interpretation, nor in writing of the report or the decision to submit for publication. All authors had full access to all the data.

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Conflicts of interest

The authors declare no conflicts of interest.

Acknowledgements

We would like to thank all participating hospital organizations, local investigators and nursing staff. We would like to thank our student team for their work. We thank Isabel van den Boogert for her exceptional work in managing this project. And we would like to thank Erwin Kompanje and Ko Hagoort for their advice.

Appendix A. Supplementary data

Supplementary material related to this article can be found, in the online version, at https://doi.org/10.1016/j.resuscitation.2020.04.004.

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