# Patient reluctance to accept Do Not Resuscitate order: impact on clinical care

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## Abstract

**Background:** A Do Not Resuscitate (DNR) order should only impede the performance of cardiopulmonary resuscitation in case of cardiac or respiratory arrest; it should not interfere with any other treatment decisions.

**Aims:** To study the impact of DNR order placement on daily clinical care of patients.

**Methods:** This was a retrospective cohort study of 72 patients in a tertiary care centre in Saudi Arabia. Daily clinical care measures were collected for 2 weeks prior and 2 weeks after DNR order placement and included vital signs, nursing care, comfort measures, documentation, visits by senior and junior physicians, and tests completed.

**Results:** Malignancy was the most common diagnostic category (43.1%). There was a significant reduction in vital signs documentation, tests completed, documentation, and visits by physicians after DNR orders, with no change in nursing care and comfort measures. No differences were seen for place of DNR order (intensive care unit vs medical ward), category of disease, or sex, but there were differences for documentation (more in females) and vital signs (more in males). More vital signs were documented and more tests were done in patients who survived compared to those who died. Regression analysis showed that the frequency of post-DNR order vital signs measurements and investigations done was not related to sex, age, diagnosis, time from admission to DNR order, or location of patients. Time to death was only related to sex and post-DNR order summary documentation.

**Conclusions:** Placement of DNR orders significantly reduced vital signs measurements, investigations done, documentation and visits by physicians but not nursing care and comfort measures.

Keywords: clinical care, Do Not Resuscitate order, patient reluctance, Saudi Arabia

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## Introduction

According to the President's Commission for the Study of Ethical Problems in Medicine and Biomedical and Behavioral Research, a Do Not Resuscitate (DNR) order should only impede the performance of cardiopulmonary resuscitation in case of cardiac or respiratory arrest; it should not interfere with any other treatment decisions. Placing a patient on a DNR order, however, may have significant implications for various aspects of clinical care and mortality (1).

Patients hospitalized with acute heart failure who have a DNR order placed are less likely to have their left ventricular function evaluated or be given beta blockers or anticoagulants (2). DNR orders in hospitalized patients are significantly associated with patients' age, social dependence and diagnosis of malignancy or acute stroke (3).

A study in the United Kingdom of Great Britain and Northern Ireland compared the level of care provided to stroke patients with and without a DNR order and concluded that the former received a lower level of care as they were less likely to be admitted to a specialized stroke unit (4). Their mortality rate was higher than that of patients with no DNR orders (10% vs 67%).

It is also reported that patients with DNR orders receive different treatments in different hospitals, which affects their outcome. The hospitals with the highest early DNR order rate (adjusted for case mix) had fewer interventions and lower costs per patient. The author concluded that "early care limitation leads to an overall milieu of nihilism that, perhaps unexpectedly, may influence attitudes of care for patients beyond those with the DNR orders themselves".

The impact of DNR orders on care provision has not been adequately investigated worldwide, and to the best of our knowledge it has not been measured in Saudi Arabia. Due to the unique cultural aspects of Saudi Arabia, we cannot assume that the results of international studies are representative of Saudi hospitals. In addition,

some Saudi hospitals lack regulations to guide the use of DNR orders and their effect on quality of care (5).

This study evaluated the impact of DNR orders on some aspects of care provided for patients at a tertiary care university hospital in Riyadh, Saudi Arabia by comparing the level of care before and after DNR orders.

## Methods

This was a retrospective cohort study on the impact of DNR orders placed by the most responsible physician (MRP). The MRP was not part of the study or aware of it, and his decision was independent of the study. MRP is a term used in our hospital to indicate the consultant physician who has the most responsibility on patient management. The study was conducted in King Abdul-Aziz Medical City (KAMC), Riyadh from March 2016 to June 2017. KAMC is an institution with 260 beds in medical wards. An estimated of 15–20 patients are admitted daily from the emergency room to these wards.

All adult patients placed on a DNR order by the MRP within the data collection period and who had complete files were included, provided that the DNR order was written for at least 1 week. The following patients were excluded: those with DNR orders referred to palliative care; those who died within 48 hours of writing the DNR order; those for whom a DNR order was placed < 1 week after admission; and those with DNR orders before their current hospitalization.

The medical wards were visited by one of the investigators 3 times a week. On each visit, the charge nurse was asked about new DNR orders on patients. Patients' records were reviewed for the week before and the week after placement of the DNR order.

The variables documented were demographics (age, sex, admission date, DNR date, date of death, and admission diagnosis category) and frequency of daily clinical care measures. The scores were summated into the following categories: (1) frequency of vital signs recording (blood pressure, respiratory rate, and $O_2$ saturation); (2) nursing practice (pain assessment recording, mouth care frequency, and frequency of position changes); (3) comfort measures (pain relief); (4) documentation; (5) frequency of visits by senior physicians; (6) frequency of visits by junior physicians; and (7) recording of tests completed (number of daily blood tests, number of blood product units transfused, number of radiological tests, and number of blood cultures).

The summative "vital signs" mean score was calculated as the mean of the measurement of blood pressure, respiratory rate and $O_2$ saturation pooled together throughout each of the observation periods (pre- or post-DNR orders). Each of these variables carried the same weight. The summative "comfort and nursing care" mean score was calculated as the mean of the numbers of pain assessments, mouth care, position changes and pain relief measures pooled together throughout each of the observation periods (pre- or post-DNR orders). Each of these variables carried the same weight. The summative "tests completed" mean score was calculated as the mean of the numbers of daily blood tests, blood product units transfused, radiological tests completed, and blood cultures pooled together throughout each of the observation periods (pre- or post-DNR orders). Each of these variables carried the same weight. The summative "senior physicians" mean score was calculated as the mean number of visits by consultants, associate consultants and medical fellows pooled together throughout each of the observation periods (pre- or post-DNR orders). Each of these variables carried the same weight. The summative "junior physicians" mean score was calculated as the mean number of visits by assistant consultants, residents and staff physicians pooled together throughout each of the observation periods (pre- or post-DNR orders). Each of these variables carried the same weight. The scores of pain relief drugs refers to the mean number of times an analgesic drug was given, pooled together throughout each of the observation periods (pre- or post-DNR orders). Each of the drugs given carried the same weight.

Data were analysed using SPSS version 21 and descriptive statistics were generated (mean and standard deviation for continuous variables). Percentages and proportions were calculated for categorical data. Paired samples *t* test was used to compare the means before and after DNR orders. Independent sample *t* test was used for the post-DNR order results according to median age, sex and disease category. Regression analysis was performed to assess the independent effect of demographics and underlying diagnosis on patient care and time to death post-DNR order. $P < 0.05$ was considered statistically significant.

## Results

Seventy-two patients were included in the study with an average age of 74.4 years and 41 (56.9%) were male. Time from admission to DNR order was 43.5 days. DNR orders were placed at the intensive care unit (ICU) in 20 (27.8%) cases and at the medical wards in 52 (72.2%) cases. The overall mortality rate was 29.2% (21 patients) with a mean time from DNR order to death of 43.2 days.

The commonest comorbid conditions were organ failure and bedridden status (both $n = 21$; 29.2%) and dementia ($n = 9$; 12.5%). A total of 33 (45.9%) patients were bedridden (Table 1).

When comparing the whole group for pre- and post-DNR order frequency of care measures, we found a highly significant drop in the frequency of measuring vital signs, doing tests, documentation and visits by physicians (Table 2). However, nursing care or comfort measures did not differ and there was more pain relief medication given after DNR order placement.

When comparing post-DNR summative scores in patients below and above the median age, we found no significant differences, except in the comfort measures, which were higher in the older group (Table 3).

When comparing post-DNR summative scores according to sex, we found significant differences in

**Table 1 Sample participants' characteristics**

| | |
|---|---|
| ***Number*** | 72 |
| Age (SD) | 74.4 (14.4) years |
| Males | 41 (56.9%) |
| Time from admission to DNR order (SD) | 43.5 (72.6) days |
| Location of DNR order ICU<br>Medical ward | 20 (27.8%)<br>52 (72.2%) |
| Pre-DNR order follow up duration (SD) | 12.8 (2.4) days |
| Post-DNR order follow up duration (SD) | 13.2 (1.9) days |
| Time from DNR order death (SD) | 43.2 (43.0) days |
| Overall mortality in DNR patients during study follow-up | 21 (29.2%) |
| ***Diagnosis category*** | |
| Dementia | 9 (12.5%) |
| Malignancy | 5 (6.9%) |
| Organ failure | 21 (29.2%) |
| Bedridden | 21 (29.2%) |
| Others | 4 (5.5%) |
| Dementia and bedridden | 9 (12.5%) |
| Malignancy and bedridden | 3 (4.2%) |

*DNR = Do Not Resuscitate; SD = standard deviation.*

only 2 parameters: men had more vital signs measured than women had, and women had more documentation than men had (Table 4). When comparing post-DNR summative scores according to patient survival during the observation period, we found significant differences in only 2 parameters: patients who died had more vital signs measured than those who survived, and those who died had more tests done. Patient sex and disease category did not differ between those who died and those who survived.

Regression analysis showed that the frequency of post-DNR vital sign measurements and investigations done was not related to sex, age, diagnosis, time from admission to DNR order placement, or location of patients. However, age affected post-DNR order comfort measures given ($P$ = 0.0044), sex affected post-DNR order frequency of visits by junior staff and frequency of documentation. Time to death was not related to age, diagnosis (except dementia), time from admission to DNR order, location of patients, or post-DNR care given. However, time to death was related to sex and post-DNR documentation.

## Discussion

DNR orders only mean that there should be no attempt at cardiopulmonary resuscitation and should not mean abandoning other forms of therapy, unless clearly specified. A DNR order does not prevent blood tests, vital sign measurement, nursing care and other services, including ICU admission and ventilation, unless clarified and communicated to patients or their families. All other clinical care measures should be adhered to. In some terminal care patients, however, the DNR order may be a part of a palliative care plan that allows only comfort care measures.

As others have found, when we compared pre- and post-DNR order frequency of care measures, we found a highly significant drop in the frequency of measuring vital signs, investigations, documentation and visits by physicians. However, nursing care or comfort did not

**Table 2 Summative score pre- and post-DNR in the areas studied**

| | Pre-DNR summative score[a] | Post-DNR summative score[a] | Mean difference (95% CI) | *P* |
|---|---|---|---|---|
| Vital signs | 10.84 (5.4) | 7.18 (2.6) | -3.66 (-4.77 to -2.56) | 0.0001 |
| Comfort and nursing care | 2.08 (0.58) | 2.26 (1.06) | 0.18 (-0.06 to 0.41) | 0.13 |
| Pain relief drugs given | 0.1 (0.4) | 0.4 (0.8) | 0.3(-0.5 to -0.1) | 0.003 |
| Laboratory tests | 3.00 (1.58) | 1.97 (0.89) | 1.03 (1.41 to 0.65) | 0.0001 |
| Documentation | 3.27 (2.34) | 2.33 (1.19) | 0.94 (1.32 to 0.56) | 0.0001 |
| Visits from senior physicians | 0.76 (0.25) | 0.52 (0.22) | -0.24 (-0.31 to -0.17) | 0.0001 |
| Visits from junior physicians | 0.37 (0.13) | 0.30 (0.12) | -0.064 (-0.10 to -0.03) | 0.0007 |

[a]*Values in parentheses are standard deviation. CI = confidence interval; DNR = Do Not Resuscitate; SD = standard deviation.*

**Table 3 Comparing post-DNR summative scores in patients below and above median age of the whole group (76.0 years)**

| Variables assessed post-DNR | Below median age[a] | Above median age[a] | *P* |
|---|---|---|---|
| Vital signs | 6.67 (2.28) | 7.72 (2.92) | 0.15 |
| Comfort | 2.03 (0.53) | 2.50 (1.39) | 0.001 |
| Tests completed | 2.08 (0.87) | 1.85 (0.90) | 0.84 |
| Documentation | 2.32 (1.17) | 2.35 (1.22) | 0.80 |
| Visits from senior physicians | 0.52 (0.24) | 0.52 (0.21) | 0.45 |
| Visits from junior physicians | 0.28 (0.2) | 0.33 (0.11) | 0.06 |

[a]*Values in parentheses are standard deviation. DNR = Do Not Resuscitate.*

differ and there was more pain relief given after DNR order placement compared to before the order (*6*,*7*).

When we compared the mean summative scores of patients who died and those who did not during the observation period, we found no differences, except that more vital signs were documented and more tests were done in the group that died. This indicates that the physicians paid more attention only when the patients became seriously ill. However, the sex of the patients and their disease category did not differ according to whether the patients died or not.

These findings are consistent with other international studies reporting a significant change in practice for patients with DNR orders placed early after admission. A study from California, United States of America reported that among 5212 patients admitted after an out-of-hospital cardiac arrest, about one third had a DNR order within the first 24 hours. Compared to those who did not have a DNR order, this group of patients had fewer cardiac catheterizations, less blood transfusion, fewer interventions and higher mortality. The authors concluded that DNR orders within 24 hours may have been premature as they were associated with reduced interventions that could have improved outcome. The authors also noted significant differences in the practice between the hospitals studied (*8*). Patients with DNR orders fare less well in terms of prognosis than those without DNR orders, even after full adjustment for risk factors. Mortality rates are higher in patients with DNR orders compared to patients with similar severity of illness and comorbidity but without DNR orders in place (*9*, *10*). A study of > 15 000 trauma patients found that DNR status and not age affected the post-injury outcome (*11*). However, Chu et al., in a review of the influence of DNR orders on patient care in adult ICUs, could not identify a direct impact of DNR orders on patient care (*12*).

In our patient population the drop in care after DNR was seen only among physicians rather than nurses. This may be because nursing care is usually more protocolled or that nursing assessment is more closely monitored by charge nurses in the unit and fellow nurses on the next shifts. It also may be down to cultural factors as most nurses are expatriates and are more committed due to fear for their jobs. Physicians, however, especially junior physicians may mistake the concept of DNR with comfort care only. The increase in analgesic prescription could reflect their notion of DNR meaning only to comfort patients and not to address their actual complaints.

There are only sparse data addressing nursing care after DNR order placement. The role of nursing in DNR orders and care planning and nursing workloads after DNR order placement have been addressed, but only a few studies have investigated the actual level of nursing care delivered (*13*,*14*). Henneman et al. reported that nurses stated that they would be significantly less likely to perform a variety of physiological monitoring procedures and interventions for patients with a DNR order than for patients without such an order (*15*).

This drop in post-DNR order care with resultant unintended harmful consequences has caused many hospitals to adopt an alternative approach to DNR orders. The Universal Form of Treatment Options (UFTO) is one of these alternatives. UFTO has resulted in a significant reduction in harmful events in patients with DNR orders, indicating that it has improved care for this group of patients (*16*). Others have replaced the DNR order with care plans of comfort and supportive care to eliminate misunderstanding attached to the order (*17*).

**Table 4 Comparing post-DNR summative scores by sex and whether patients died or survived**

| Variables assessed post-DNR | By sex | | |
|---|---|---|---|
| | Males | Females | *P* |
| Vital signs | 7.7 (3.1) | 6.4 (16) | 0.033 |
| Documentation | 1.8 (3.0) | 3.0 (1.0) | 0.0001 |
| | By survival | | *P* |
| | Died | Survived | |
| Vital signs | 8.4 (3.3) | 6.7 (2.0) | 0.017 |
| Tests completed | 2.3 (1.1) | 1.8 (0.7) | 0.045 |

*Only significantly different scores are shown. Values in parentheses are standard deviation. DNR = Do Not Resuscitate.*

Our study was limited by its small sample size and being a single centre study. However, our results should inspire more research to validate our findings and observe any variation in hospital practices.

## Conclusion

DNR orders are associated with a significant reduction in physicians providing clinical care, which may lead to more refusals of family members to allow DNR orders. Physicians need more insight into the true goals of DNR orders and should not equate them with withholding other therapeutic interventions. DNR orders should not be the first step in a continuum of limitations on care, unless clear goals are established with patients and their families.

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**Competing interests:** None declared.

## Réticence du patient à accepter l'ordre de ne pas réanimer : conséquences sur les soins cliniques

### Résumé

**Contexte :** Un ordre de ne pas réanimer doit seulement empêcher l'exécution de la réanimation cardio-respiratoire en cas d'arrêt cardiaque ou respiratoire ; il ne doit pas interférer avec d'autres décisions thérapeutiques.

**Objectifs :** Étudier les conséquences de l'ordre de ne pas réanimer sur les soins cliniques quotidiens des patients.

**Méthodes :** Il s'agissait d'une étude de cohorte rétrospective portant sur 72 patients d'un centre de soins tertiaires en Arabie saoudite. Des mesures des soins cliniques quotidiens ont été recueillies pendant deux semaines avant et deux semaines suite à l'émission de l'ordre de ne pas réanimer. Elles ont notamment pris en considération les signes vitaux, les soins infirmiers, les mesures de confort, la documentation, les visites des médecins principaux ou assistants et les examens effectués.

**Résultats :** La malignité était la catégorie de diagnostic la plus courante (43,1 %). On a constaté une réduction significative des mesures des signes vitaux, des examens effectués, de la documentation et des visites des médecins suite à l'émission des ordres de ne pas réanimer, sans aucun changement au niveau des soins infirmiers et des mesures de confort. Aucune différence n'a été constatée en ce qui concerne le lieu associé à l'ordre de ne pas réanimer (unité de soins intensifs ou service d'hospitalisation), la catégorie de la maladie ou le sexe, mais des différences ont été observées pour la documentation (plus détaillée chez les femmes) et la mesure des signes vitaux (plus fréquente chez les hommes). Les signes vitaux avaient davantage été documentés et plus d'examens avaient été effectués chez les patients qui ont survécu que chez ceux qui sont décédés. L'analyse de régression a montré que la fréquence de la mesure des signes vitaux et des examens effectués suite à l'émission de l'ordre de ne pas réanimer n'était pas liée au sexe, à l'âge, au diagnostic, au temps écoulé entre l'admission et l'émission de l'ordre de ne pas réanimer, ni au lieu de prise en charge du patient. Le délai avant le décès n'était lié qu'au sexe et à la documentation sommaire établie à la suite de l'émission de l'ordre.

**Conclusions :** L'émission d'un ordre de ne pas réanimer réduisait de manière significative la mesure des signes vitaux, les examens effectués, la documentation et les visites des médecins, mais pas les soins infirmiers ni lesmesures de confort.

## تردد المرضى في قبول أمر "عدم الإنعاش": الآثار المترتبة على الرعاية السريرية

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### الخلاصة

**الخلفية:** يجب أن يمنع أمر "عدم الإنعاش" أداءَ الإنعاش القلبي الرئوي فقط في حالة تَوَقُّف القَلْب أو التنفس؛ ولا يجب أن يتداخل مع أي قرارات أخرى للعلاج.

**الأهداف:** دراسة أثر تنفيذ أمر "عدم الإنعاش" على الرعاية السريرية اليومية للمرضى.

**طرق البحث:** أُجريت دراسة أترابية استرجاعية شملت 72 مريضاً في أحد مراكز الرعاية الثالثية في المملكة العربية السعودية. وقد حُصرت تدابير الرعاية السريرية اليومية لمدة أسبوعين قبل أمر "عدم الإنعاش" وأسبوعين آخرين بعده، وشملت العلامات الحيوية، والرعاية التمريضية، وتدابير تحقيق الراحة، والتوثيق، وزيارات كبار وشباب الأطباء، وإتمام الفحوص.

**النتائج:** كان التشخيص بالإصابة بورم خبيث أكثر الفئات التشخيصية الشائعة (43.1٪). وقد حدث انخفاض ملحوظ في توثيق العلامات الحيوية، وإتمام الفحوص، والتوثيق، وزيارات الأطباء عقب إصدار أوامر "عدم الإنعاش"، مع عدم وجود أي تغيير في الرعاية التمريضية وتدابير تحقيق الراحة. ولم يُلاحَظ أي تغيير في تنفيذ أمر "عدم الإنعاش" (وحدة الرعاية المركزة مقابل الجناح الطبي)، أو فئة المرض، أو نوع الجنس، ولكن

لوحظ بعض التباين من حيث التوثيق (أكثر في الإناث) والعلامات الحيوية (أكثر في الذكور). وكان معدل توثيق العلامات الحيوية وإجراء مزيد من الفحوص أعلى في المرضى الذين نجوا وظلوا على قيد الحياة عنه في الذين تُوفُّوا. وقد بيّن تحليل الانحدار أن وتيرة أخذ قياسات العلامات الحيوية والاستقصاءات عقب أمر "عدم الإنعاش" غير مرتبطة بنوع الجنس، أو العمر، أو التشخيص، أو المدة الزمنية من وقت دخول المستشفى وحتى صدور الأمر، أو مكان المرضى. وارتبطت الفترة الزمنية حتى الوفاة فقط بنوع الجنس وتوثيق ملخص ما بعد أمر "عدم الإنعاش".

**الاستنتاجات:** أدى تنفيذ أمر "عدم الإنعاش" بصورة كبيرة إلى خفض قياسات العلامات الحيوية، وإتمام الاستقصاءات، والتوثيق، وزيارات الأطباء، ولكن الأمر كان مختلفاً بالنسبة للرعاية التمريضية وتدابير تحقيق الراحة.

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