Evaluation of do not resuscitate orders (DNR) in a Swiss community hospital

N Junod Perron, A Morabia, A de Torrenté

Objective: To evaluate the effect of an intervention on the understanding and use of DNR orders by physicians; to assess the impact of understanding the importance of involving competent patients in DNR decisions.

Design: Prospective clinical interventional study.

Setting: Internal medicine department (70 beds) of the hospital of La Chaux-de-Fonds, Switzerland.

Participants: Nine junior physicians in postgraduate training.

Intervention: Information on the ethics of DNR and implementation of new DNR orders.

Measurements and main results: Accurate understanding, interpretation, and use of DNR orders, especially with respect to the patients’ involvement in the decision were measured. Junior doctors writing DNR orders had an extremely poor understanding of what DNR orders mean. The correct understanding of the definition of a DNR order increased from 31 to 93% (p<0.01) after the intervention and the patients’ involvement went from 17% to 48% (p<0.01). Physicians estimated that 75% of their DNR patients were mentally competent at the time of the decision.

Conclusion: An intervention aimed at explaining the ethical principles and the definition of DNR orders improves understanding of them, and their implementation, as well as patient participation. Specific efforts are needed to increase the involvement of mentally competent patients in the decision.

Do not resuscitate (DNR) orders are somewhat ambiguous with respect to the distinction between life saving therapies (cardiopulmonary resuscitation (CPR)) and life sustaining measures. This situation is a source of confusion and misinterpretation by physicians.1-4

Physicians are also reluctant to discuss DNR attitudes with patients despite their known unreliability in predicting their patients’ preference for or against CPR.5-10

Contrary to the situation prevailing in the USA and the UK where recommendations for the use of DNR orders have been produced and regularly updated, this problem has not received much attention in Switzerland.11-14 The political and public debate mainly focuses on passive and indirect active euthanasia, and physician assisted suicide. The use and implication of DNR orders in hospitals has never attracted the attention of the media and is a topic generally ignored by the public. The Swiss Academy of Medical Sciences, which established medicoethical guidelines regarding end of life care in 1995 and ethical problems in intensive care units (ICUs) in 1999, makes no mention of DNR until 1999 and has never specifically defined the use and implication of DNR orders when giving recommendations regarding the withholding or withdrawing of treatments.15-18 Furthermore, although many hospitals have developed their own guidelines about DNR orders, we are aware of only one Swiss study which has assessed their use in a tertiary hospital.19

We therefore decided to assess the understanding of DNR orders and their application by young physicians in a Swiss community hospital. Special attention was given to the involvement of patients in the decision.

We hypothesised that ignorance and lack of familiarity with the ethical component of DNR orders rather than predetermined attitudes were the basis of ethically incorrect behaviour on the part of these young physicians. Therefore, we expected that an intervention aimed at explaining and clarifying these various aspects of DNR would improve their use.
not cover other measures such as life sustaining treatments. It was also stressed that a DNR decision should not be the only motive for a discussion with the patient but should be part of overall care planning after an exploration of the patient’s expectations and desires in order to achieve common goals.

At the same time, new DNR guidelines were implemented by the head of the department, based essentially on those proposed by the American Medical Association’s Council on Ethical and Judicial Affairs in 1991. During P1, two DNR codes were used. Code B meant medication only without chest compression, intubation or defibrillation in the event of a cardiopulmonary arrest (limited code). Code C meant no resuscitation at all in the event of a cardiopulmonary arrest. During P2 only the DNR type C was used. None of these codes included the withdrawal or withholding of other therapeutic interventions. The guidelines highlighted the absolute right of mentally competent and informed patients to decide about their resuscitation. A DNR order could, however, be written by a physician after he or she had informed the patient that CPR was considered futile. In such a situation, gaining the patient’s understanding and acceptance of the clinical condition seemed to us more important than offering choice when there were no options. In cases where there was conflict, a second medical opinion was required. Medical futility was defined as a prolongation of suffering without any benefit, or restoration of vital parameters for only a very short period of time (hours or days), or no restoration at all. Main aims were first to assess the correct understanding of DNR definition by physicians and second to evaluate the patients’ participation in the DNR decision before and after the intervention. The study protocol was approved by our local hospital directory committee.

The statistical significance of differences between P1 and P2 in answers for variables such as age, marital status, sex, diagnosis, and data pertaining to DNR orders was assessed by the χ² test p value < to 5%.

RESULTS

A total of 255 patients were given a DNR order, 140 during P1 and 115 during P2, representing 16% and 19% of medical admissions. Mortality of DNR patients was 29.3% during P1 and 26.1% during P2. Except for metastatic cancer, no differences in socio-demographic and diagnostic characteristics existed between P1 and P2 patients (see table 1). During P1, when asked about what they meant by writing a DNR order, physicians differed noticeably in their definition of DNR orders (see table 2). They tended to include defibrillation in the limited DNR measures (code B) in 33.3% of the answers and mixed up no resuscitation in case of cardiopulmonary arrest (code C) with comfort therapy in 56.3% of the cases. During P2, after intervention and implementation of a single DNR code type C, 93% of the answers were correct (p<0.001). Physicians no longer considered comfort therapy or other treatments to be part of the DNR definition.

Figure 1 shows that the intervention increased the patients’ participation in the DNR decision from 17.1% in P1 to 47.8% in P2.

Table 1  Demography and medical diagnosis of do not resuscitate patients

<table>
<thead>
<tr>
<th>Variables, categories</th>
<th>Period 1 n=140</th>
<th>Period 2 n=115</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age [years]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤65</td>
<td>26 18.6</td>
<td>34 29.6</td>
</tr>
<tr>
<td>66 to 80</td>
<td>61 43.6</td>
<td>46 40.0</td>
</tr>
<tr>
<td>&gt;80</td>
<td>53 37.9</td>
<td>35 30.4</td>
</tr>
<tr>
<td>p=0.108*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>male</td>
<td>77 55.0</td>
<td>52 45.2</td>
</tr>
<tr>
<td>female</td>
<td>63 45.0</td>
<td>63 54.8</td>
</tr>
<tr>
<td>p=0.12*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
</tr>
<tr>
<td>single</td>
<td>8 5.7</td>
<td>10 8.8</td>
</tr>
<tr>
<td>married</td>
<td>77 55.0</td>
<td>53 46.5</td>
</tr>
<tr>
<td>widowed</td>
<td>44 31.4</td>
<td>34 29.8</td>
</tr>
<tr>
<td>divorced/separated</td>
<td>11 7.9</td>
<td>17 14.9</td>
</tr>
<tr>
<td>p=0.202*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>cancer</td>
<td>23 6.4</td>
<td>16 13.9</td>
</tr>
<tr>
<td>metastatic cancer</td>
<td>27 19.3</td>
<td>49 42.6</td>
</tr>
<tr>
<td>cardiac disease</td>
<td>27 19.3</td>
<td>15 13.0</td>
</tr>
<tr>
<td>others</td>
<td>63 45.0</td>
<td>35 30.4</td>
</tr>
<tr>
<td>p&lt;0.01*</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Comparison between periods 1 and 2. Bold characters are used for statistically significant differences.

Table 2  Distribution of physicians’ answers when asked about what they meant by writing a DNR (do not resuscitate) order (five possible answers offered). During P1, B meant medication only without chest compression, intubation or defibrillation and C no resuscitation at all in the event of a cardiopulmonary arrest (CPA). During P2, DNR meant no resuscitation at all in the event of a CPA

<table>
<thead>
<tr>
<th>Definition of DNR orders</th>
<th>Period 1 (n=69)</th>
<th>Period 2 (n=71)</th>
<th>Period 2 (n=115)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No resuscitation, comfort</td>
<td>3 4.3</td>
<td>40 56.3</td>
<td>5 4.3</td>
</tr>
<tr>
<td>No resuscitation if CPA</td>
<td>2 2.9</td>
<td>22 31.0</td>
<td>107 93.0</td>
</tr>
<tr>
<td>Medication, defibrillation,</td>
<td>23 33.3</td>
<td>1 1.4</td>
<td>2 1.7</td>
</tr>
<tr>
<td>no chest compression, no</td>
<td>40 58.0</td>
<td>4 5.6</td>
<td>1 0.9</td>
</tr>
<tr>
<td>intubation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication, no defibrillation</td>
<td>1 1.4</td>
<td>4 5.6</td>
<td>0 0.0</td>
</tr>
</tbody>
</table>

Bold characters are used for correct answers.
showed improvements in some aspects of DNR order
the ethical basis of a DNR order.

an explanation about the clarification of DNR definition and
participation of mentally competent patients can result from
of a DNR code by junior physicians and an increased
Our study shows that a better understanding of the meaning
DISCUSSION
fer between the two periods.
P2; the involvement of family doctors was minimal, being
involved in DNR decisions: 47.1% during P1 and 53.9% during
patient or his diagnosis. Senior doctors were not often
and 33.9%, independently of the mental competence of the
are not able to assess if the result is attributable to a few or all
physicians. Nurses participated in 57.9% and 67.8% of DNR
decisions respectively in P1 and P2, and the family in 30.7% and
33.9%, independently of the mental competence of the
patient or his diagnosis. Senior doctors were not often
involved in DNR decisions: 47.1% during P1 and 53.9% during P2; the involvement of family doctors was minimal, being <8% in both periods. All these results did not statistically differ between the two periods.

In Figure 2 patients with a MMSE score \( \geq 24 \) increased their participation from 6.1% in P1 to 48.5% in P2 (p<0.01) and patients with an MMSE <24 from 23.8% to 47.1% (p<0.001).

DISCUSSION
Our study shows that a better understanding of the meaning of a DNR code by junior physicians and an increased participation of mentally competent patients can result from an explanation about the clarification of DNR definition and the ethical basis of a DNR order.

Introduction of a single code (DNR) with a clarification of its components (application only to a full cardiopulmonary arrest with withholding of all elements of CPR and no limitation of other therapeutic interventions) helped physicians to understand more accurately the definition of a DNR order. Indeed, only 31% of the answers given by physicians about what they meant by writing a DNR order (no resuscitation at all in the event of a cardiopulmonary event) were correct in the preintervention period according to DNR local hospital guidelines, versus 93% in the postintervention period. The main confusion lay between comfort therapy/no resuscitation and the limited or full DNR status, and the limitation of other care was moderate agreement among residents and attending physicians regarding the clinical setting to which DNR applied, the limited or full DNR status, and the limitation of other care was moderate to fair before intervention.

Because we suspected ignorance about DNR issues among our junior doctors, we first aimed at clarifying DNR before addressing other complex issues such as the limitation of life sustaining interventions. Unlike other intervention studies, however, we preferred a single DNR code which included all aspects of no cardiopulmonary resuscitation to a detailed procedure specific DNR order form. We thought it would be difficult and unnecessarily distressing for all patients to discuss and understand the details and technical aspects of each item of cardiopulmonary resuscitation during the patient physician dialogue about resuscitation issues unless patients requested them. We believed that DNR orders should reflect patients’ global expectations and desires relating to immediate life saving measures. Our intervention seems to work, since no other measures except those directly related to CPR were included in the DNR definition during P2.

Furthermore, the increase in patients’ participation is noteworthy and indicates that beside the fact that the physicians defined the DNR code better, they also integrated some ethical dimensions of DNR. The medical literature mentions patients’ participation rates as being between 18% and 30%. Some intervention studies did not increase the patients’ participation.

It may be that the lack of familiarity of the Swiss physicians in training with DNR issues made them more amenable to an improvement in discussing these difficult matters with patients. Surprisingly, the increase in patients’ participation in DNR orders was also obtained in patients with a MMSE <24 (half of them having a score between 20 and 23 (see figure 2). Some recent studies suggest a positive correlation between patients’ decision making capacity and MMSE scores, 23 and 24 being the threshold.

Although MMSE was designed to evaluate cognitive disorders and not to assess decision making ability (it does not address the four skills pointed out by Appelbaum & al: communicat-
choices, understanding relevant information, appreciating the consequences of a decision and manipulating information rationally), this result is confusing. Unfortunately, we do not know how physicians involved their patients in the DNR decision. That is to say we do not know whether they communicated the information so that patients were able to make informed decisions, or merely conveyed the decision to the patient. It may be less stressful to discuss such matters with patients suffering from a slight mental impairment. This result could also indicate, however, that physicians did not properly evaluate their patients’ ability to make decisions and did not correctly apply DNR orders. Other actors (nurses, family) did not improve their participation rate after the intervention.

Our results indicate that, before the intervention, our physicians were mostly unaware of the definition and use of DNR orders. This situation can be explained by the fact that DNR orders were usually written by senior physicians. There is little or no training in medical ethics in the pregraduation years of Swiss medical studies. The Swiss Academy of

<p>| Table 3 Physicians’ judgment of the mental competence of the do not resuscitate (DNR) patients |
|-----------------------------------------------|---------------|
| Mental competence of DNR patients            |
|                                             | Period 1       | Period 2       |</p>
<table>
<thead>
<tr>
<th>n</th>
<th>%</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absent</td>
<td>35</td>
<td>25.0</td>
<td>21</td>
</tr>
<tr>
<td>Present</td>
<td>105</td>
<td>75.0</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>p=0.195</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 2 Involvement rate of Do Not Resuscitate (DNR) patients in the DNR decision with respect to mental competence (clinical assessment) and mental state (measured by the Mini-Mental State Examination (MMSE) score).

P2 (p< 0.01) whereas roughly the same percentage of patients were considered mentally competent during P1 and P2 (75% compared with 81.7% respectively) (see table 3). As the nine physicians answered all 255 questionnaires anonymously, we are not able to assess if the result is attributable to a few or all physicians. Nurses participated in 57.9% and 67.8% of DNR decisions respectively in P1 and P2, and the family in 30.7% and 33.9%, independently of the mental competence of the patient or his diagnosis. Senior doctors were not often involved in DNR decisions: 47.1% during P1 and 53.9% during P2; the involvement of family doctors was minimal, being <8% in both periods. All these results did not statistically differ between the two periods.

In Figure 2 patients with a MMSE score \( \geq 24 \) increased their participation from 6.1% in P1 to 48.5% in P2 (p<0.01) and patients with an MMSE <24 from 23.8% to 47.1% (p<0.001).
Improvement could be obtained at many level: first by introducing ethical seminars into medical studies; second by requiring that national medical authorities provide model guidelines for the correct ethical use of DNR orders; by encouraging hospitals to apply these guidelines, and fourth by conducting further studies on such issues. Although, to our knowledge, neither the media (unlike the UK) nor the courts in our country have been involved in issues regarding withholding or withdrawing therapies where the patient is ignorant of this, we should not wait for such events to happen before changing the present situation.

Some points deserve further discussion. The percentage of DNR patients in our study (16% and 19%) was unexpectedly higher than those mentioned in the literature (3% to 10% in studies excluding intensive care units). 2,14 Two explanations can be offered. First, the patients in our medical department may be older, more severely affected or with worse prognoses than those studied in previous reports. We lack data, however, to support this hypothesis. Second, those studies are exclusively American and attitudes towards life and death may be rather different, for cultural as well as judicial and insurance reasons. Furthermore, contrary to what happens in the USA, Swiss junior physicians occasionally involve senior physicians in the DNR decision who may be more restrictive in implementing DNR orders and deciding the patient’s DNR status. Finally, the limited knowledge of DNR ethics may lead to more DNR orders being written and also may be responsible for physicians writing inappropriate DNR orders.

Our study has several limitations. We studied the effect of a single intervention, where repeated interventions may be warranted to test their impact in the long term. Moreover, P2 started only one month after the intervention, when the new information was still fresh in all physicians’ minds. In other studies, the delay was longer. 15 Ideally, we should have randomised patients to an informed and an uninformed group of physicians. Our department is too small and the number of physicians in training too low to prevent sharing information between the groups. Finally, we did not assess the quality of DNR discussions between physicians and patients.

CONCLUSION
The understanding and application of DNR orders depends on both a clear definition of DNR orders and information on the need to obtain patients’ participation. In this way, our intervention was successful. The percentage of patients involved in the discussion is, however, still low. Improvement should take place at many levels and requires changes of attitudes from our medical schools, hospital directors, and national medical authorities.

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Authors’ affiliations
N Junod Perron, A de Torrente, Service de Médecine Interne, Hôpital de la Ville, La Chaux-de-Fonds, Switzerland
A Morbiet, Division d’Épidémiologie Clinique, Département de Médecine Communautaire, Hôpital Cantonal, Genève, Switzerland

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