

• ORIGINAL STUDIES •

Knowledge and Implementation of the DNR in Internal Medicine Teaching Programs

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Background: The knowledge and implementation skills of the DNR (do not resuscitate) order amongst physicians in training appears to be quite variable.

Methods: We constructed, validated and implemented an instrument which evaluates knowledge and implementation skills of medical residents regarding the DNR in the 8 accredited teaching hospitals in Puerto Rico.

Results: Participation of 136 residents from 240 approved positions was seen. Most thought (93.3%) the DNR should be written in the medical record. And 88.1% thought appropriate to suggest a DNR to the patient or family for a terminally ill patient. For a patient with an uncertain prognosis who insisted on a DNR, 78.5 % believed the attending physician and 21.5% thought the ethics committee was responsible for determining the propriety of the order. When the patient and the treating physicians agreed on the appropriateness of a DNR order most residents in the North of Puerto Rico thought the writing of the order was the purview of the resident while residents in the South-West thought this to be the responsibility of the attending physician. In the absence of a DNR order, more than 77.4% of the residents in the North and South would initiate CPR in a comatose patient with terminal cancer, multiple organ failure and sepsis in contrast to 15% of the residents in the West.

Conclusions: Implementation and knowledge skills of medical residents in the health regions of Puerto Rico differ. Knowledge and implementation of the DNR merits improvement in all training programs. [*P R Health Sci J* 2010;2:96-101]

Key words: DNR order, End-of-life care, Residency education

There is a mounting interest and debate regarding end of life care in the developed world. The issues which are frequently debated include the development and role of life sustaining technology, the ethical elements sustaining the moral issues in end of life care, the complexity of the decisions which are need to be made in the terminally ill patient and finally the greater awareness of the society at large of end of life care. End of life care continues to be an important topic of discussion in medical scenarios because of the elevated costs associated with end of life medical care (1-2).

One of the specific aspects of end of life care is the decision to offer cardiopulmonary resuscitation (CPR) to patients with impending collapse of these vital organs. CPR was introduced in 1960 as a technique to prevent sudden and unexpected death, with time it achieved universal recognition (3). Unfortunately, it soon became a ritual applied to the majority of dying patients admitted to hospitals, a decision frequently made independent of the nature of the disease or the prognosis associated with the illness (4). In many cases, the institution of CPR was viewed

as a futile effort on the part of physicians and other health care workers (5). Successful reanimation of patients sometimes led to indiscriminate implementation of costly inappropriate or excessive care to these patients (6-8). In these scenarios a debate on the difficult task of maintaining a balance between disthanasia, (therapeutic obstinacy), misthanasia (patient abandonment) and medical futility was seen (9-12). One of the issues in controversy by health care workers and eventually the community at large was whether these medical interventions were prolonging the process of dying rather than prolonging life (13-18).

One of the critical elements in the decision process of end of life care is the issue of the degree of resuscitative efforts that

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should be initiated in the event of cardio-pulmonary failure. This decision making process usually occurs in the scenario of a hospital and it is formalized by a physician order of "do not resuscitate". The first hospital policies in relation to "do not resuscitate" (DNR) appeared in the medical literature in 1976 (3) and by 1988 it became a hospital requirement by the Joint Commission on Accreditation of Health Care Organizations (19). Since then, all hospitals have formal guidelines and protocols for the implementation of the DNR order. In spite of these normative guidelines, it became clear that in the day to day practice of hospital medicine the norm was often that the majority of patients received CPR unless a DNR had been signed by the patient, or by relatives or surrogates of the patient. It is recognized that CPR has inherent risks of trauma and it may cause residual impairments contributing and often prolonging the process of dying (20). It is also fundamentally a medical decision in which an analysis of the potential effectiveness of this procedure in restoring life has to be made. . It should be a profoundly important medical decision which needs to be discussed with the patient and/or family in practically all clinical scenarios of critically ill patients (21). From this perspective it should not be housed in the archives of ethical or legal imperatives.

In the process of training residents of Internal Medicine it is important that experienced faculty members discuss the ethical and legal foundations, the indications and the process of discussing CPR and DNR with the relevant parties. It is also relevant that all trainees be familiar with the institutional protocols and guidelines that provide the normative substance to these important medical interventions. In this study, we evaluated the knowledge and the ability of internal medicine residents training in each of the 8 programs accredited by the Accreditation Council for Graduate Medical Education (ACGME) in Puerto Rico.

Methods

We constructed and validated an instrument which evaluates the knowledge and implementation skills regarding the DNR order amongst physicians in training. The content of the instrument was based on the documents and guidelines of several institutional DNR protocols as well as a standard medical text (20) used by the residents during their training. We also used the recommendations published in the fifth edition of the Ethics Manual of the American College of Physicians (21). A face validity of the instrument was performed with untrained judges who commented on meaning and clarity of the questions included. A content validity was performed by 5 reviewers who were residents in training at the time of this exercise. This activity measured how appropriate, clear and explicit were the items included in the instrument. The instrument was modified based on these two exercises and was felt ready for review by the Institutional Review Board (IRB) of our institution. The

instrument and the study methodology were subsequently approved by the IRB. All instruments were anonymous in nature and strictly voluntary. No information regarding the identity of individuals answering the instruments was gathered.

During the month of December 2008, one of the authors visited the morning report of the 8 teaching hospitals in Puerto Rico with ACGME accredited Internal Medicine programs. After a brief introduction all residents were invited to participate in this study. The instrument was distributed and collected in a manner conducive to confidentiality. This exercise was conducted only once per hospital in order to minimize duplicity in the answering of the instruments.

The instrument consisted of short initial section with general demographic information. The second section consisted of 6 questions regarding general content knowledge of the DNR protocol. The final five questions addressed straightforward short clinical vignettes which evaluated the implementations skills of applying the DNR order. The senior authors of this paper felt that the vignettes were part of the domain of classic presentations in which the process of DNR implementation could be evaluated. A self- assessment scale was also included for each resident to rate his/her knowledge on how well they understood the DNR protocol of their institution (Scale 1-10).

For purposes of analysis we constructed a knowledge scale and an implementation skills scale. A score of 5 or 6 out of six questions was established as an index of adequate knowledge. A score of 4 or 5 out five questions in the clinical vignettes section was considered adequate implementation skills.

Variables: The following variables were constructed and used for the final analyses: age (<30y vs. >31y), sex, size of training program as approved by the ACGME, (>29 residents vs. <28), level of training (1-4), location of the training program (North, South or West of the island). SPSS software version 14 was used for statistical analysis in which means, range and SD were calculated. Differences of variance were evaluated using Chi square.

Results

The instrument was completed by 136 of the 240 medical residents in the 8 teaching programs. Most of the residents were in their first (53%) and second (24%) year of training and were quite willing to answer the questionnaire. A smaller number were from third (21%) and 2% were from fourth year. The highest participation per residency program was 100% and the lowest 36.5% with a range of between 37% and 100%. In six of the eight programs surveyed the participation was over 61%. The participation was higher in the programs located in the South-West of the island as compared to the North (82% vs. 49%). Participation was limited by absences due to assignments to subspecialties, sickness, vacations and extramural rotations. Out of the eight programs 4 of them had a complement of 28 residents or less. The mean age of the residents was 31 years

(26-56y). Residents from programs in the South-West of the island were slightly older than those from the northern part of the island; 34 years versus 30 year of age. The majority of residents who participated were males (57%) as compared to females (43%). A non-significant tendency towards a higher male participation in the second and third year of training was seen. All residents had a minimum of 6 months of training in the discipline of Internal Medicine.

In the initial question, which asked each responder to self-evaluate his/her knowledge of the DNR protocol, all residents who participated mentioned they were familiar with the DNR protocol, but 25% categorized their level of knowledge as 7 or less. The majority of responders (93.3%) answered correctly that it was necessary to have the DNR order reflected as a written physician order in the medical record. The remaining answered that a verbal documentation by the patient or responsible relatives was sufficient. For a terminally ill patient, more than 88.1% of the residents in all institutions considered appropriate to suggest a DNR order to the patient or to the family if they had not made a specific request towards this end. If a patient with an uncertain diagnosis and prognosis insisted on signing a DNR there were divergent and statistically significant differences in the opinions among the training programs in the North as compared to those in the South and West of the island as to who should be responsible for assuming the responsibility of the process of the DNR order (Table 1). This question was not constructed as mutually exclusive so multiple answers were permitted. The great majority of the residents in the South-West assigned this responsibility to the attending physician as compared to the programs in the North of the island (94% vs. 69%). Nearly a third of the residents from programs located in the Southwest also believed that the resident and the various institutional ethics committees carried this responsibility.

Table 1. (Knowledge) If the patient’s diagnosis and prognosis are not clear and the patient insists on a DNR order who is responsible for the propriety of the order?*

Region	Attending physician		Resident		Ethics Committee	
	Yes	No	Yes	No	Yes	No
North	68.7%	31.3%	44.6%	55.4%	15.7%	84.3%
South-West	94.2%	5.8%	26.9%	73.1%	30.8%	69.2%
Total	78.5%	21.5%	37.8%	62.2%	21.5%	78.5%

*(P-value < 0.05)

Significant regional variations with regards to who is responsible for writing a DNR order when the patient and the treating physicians agree were seen. (Table 2). Programs in the North of the island more frequently believed that this was the responsibility of the resident rather than the attending physician.

A question was presented that addressed the appropriateness of permitting feeding, maintaining parenteral hydration,

continued pain medication and mechanical ventilation support for a terminally ill patient with a DNR order. Over 93% of residents correctly identified as appropriate all of these interventions for a patient with a DNR in Puerto Rico; two percent would not give pain medication; and 7.4% thought appropriate to establish mechanical ventilation. Sixty nine percent of respondents thought a DNR was only valid during the current hospitalization and 27.2% believed the DNR was valid indefinitely. Between 4.8% and 30% of the respondents from the eight hospitals did not know the duration of the DNR order. In the North, 35.7% thought the DNR was valid indefinitely and in the South 9.4% thought likewise.

Table 2. (Knowledge) When the patient and the treating physicians agree on the appropriateness of a DNR order, which is responsible for writing this order?*

Region	Attending physician	Resident
North	42.0%	58.0%
South	78.1%	21.9%
West	85.0%	15.0%
Total	57.1%	42.9%

*(P-value < 0.05)

For a comatose patient with terminal cancer, multiple organ failure and sepsis and no DNR order, we found that in two hospitals 94.7% and 91.7 % of the residents would initiate CPR while in two other hospitals only 10% and 20% of the residents would initiate resuscitation. When analyzed by region, significant differences were seen with residents from the West less likely to initiate CPR as compared to the North or the South of the island (15% vs. 76% and 77%) (Table 3). An additional area of disparity was that 100% of the residents in one hospital would accept a DNR order from a quadriplegic patient in acute renal failure who refused hemodialysis while in two hospitals 61.9% and 63.6% would do so.

Table 3. (Implementation; futility) In a comatose patient with terminal cancer, multiple organ failure and sepsis, would you consider initiating CPR maneuvers if there is not a DNR order?*

Region	Yes	No
North	75.9%	24.1%
South	77.4%	22.6%
West	15.0%	85.0%
Total	67.2%	32.8%

*(P-value < 0.05)

Disparities in the concept of the role and responsibilities of the surrogate in terms of authority to revoke a DNR requested by the patient were evident. Of the total resident population, 39.6% considered appropriate a revocation by the surrogate

of an intra-hospital DNR order requested and signed by the patient. (Table 4). We were surprised to find that 29.1% of the surveyed residents would accept a DNR request from a diabetic patient with a below the knee gangrene and mayor depression. The concept of patient competency as requisite to provide valid autonomous decisions was not considered by these responders.

Table 4. (Implementation; medico/legal) May a surrogate designated by the patient revoke an intra-hospital DNR order requested and signed by the patient?*

Region	Yes	No
North	42.2%	57.8%
South	46.9%	53.1%
West	15.8%	84.2%
Total	39.6%	60.4%

*(P-value =0.06)

In table 5, we present the data in terms of the number of residents from the three regions in Puerto Rico according to whether the questions related to the knowledge or implementations skills of the DNR were appropriately answered using the scale described in the methods section. Significant differences in knowledge and implementation skills amongst the surveyed across the regions were seen. The regional differences detected were not influenced by age, sex or the size of the programs. A crosssectional analysis revealed that residents in their second year of training fared the best in both areas as compared to residents in their first or last year of training (p=.034).

Table 5. Differences in knowledge and implementation skills of the DNR order by region.

Region	Yes	No
North	42.2%	57.8%
South	46.9%	53.1%
West	15.8%	84.2%
Total	39.6%	60.4%

*(P-value <0.05)

Discussion

Although a “do not resuscitate” order (DNR) applies strictly to cardiopulmonary resuscitation, this intervention is a critical part of the care strategies that must be documented into the medical record along with physician notes and other medical orders which surround the process of end-of-life treatment plan (22). In Puerto Rico the majority of the DNR orders are initially introduced and seriously considered during a hospitalization of the patient. In these specific settings the patient is often seriously ill, the goals of therapy are not totally clear to the patient or his family, and there is often a heavy emotional

content present in all physician-patient/family encounters. In these circumstances, and with the recognition of the difficulty of making decisions of this caliber, futile prolongations of life through the implementation of medical technology are often initiated. In this paper we presented a clinical vignette with a patient scenario in which the physiological futility of continuing medical care was evident. In our survey 68% of residents would offer futile medical care in the absence of a DNR order. These results were quite unexpected since it is well accepted that physiologically futile interventions merit considerations only in the context of fulfilling a specific need of a dying patient (e.g. the imminent arrival of a child). There is clear consensus in the literature that even in if requests that “everything” be done to keep a dying patient alive indefinitely, the medical profession is not obligated to offer futile medical interventions. (17, 23-25) In emphatic terms physicians should make their medical decisions based on scientific criteria and objective results. Decisions based on subjective judgments such as “death with dignity”, or “quality of life” is not part of the medical praxis and should be avoided. Concerns on these areas should be discussed, deliberated and decided more appropriately by the patient or his representative (26).

It is important to see CPR for what it is: a medical decision to be readily taken only when it is appropriate (25). The DNR should be only part and parcel of the end-of-life planning which ideally should include other advance directives. In most countries there is a lack of national and institutional guidelines which details the protocol of DNR to be followed. We believe that all training programs would benefit from the preparation and implementation of a uniform module addressing the specific issues relevant to the DNR in Puerto Rico. This module should be culturally appropriate for our population and should incorporate the local laws and regulations and the ethical standards which guide the praxis of our patient population.

Our data suggests there is clustering of similar answers depending more on the location of the program than on the demographic variables examined such as age, gender, and size of the program. The most straight forward explanation for this clustering is that it is a reflection of the differences in the mentoring and local practices of each region. In private hospitals, DNR orders are usually written by the attending physicians while in other teaching hospitals they are more frequently written by residents. Although in most hospitals the DNR applies only to the present hospitalization, there are institutional variations as to how this is implemented: in some hospitals the DNR must be written daily, in others the order remains in place for the entire hospitalization. Some institutions require a consultation with a second attending and some physicians require written documentation from the patient or their family (a living will) before writing a DNR order (27).

The current standard in many medical institutions today is to resuscitate patients in the absence of a signed DNR. Trying to harmonize this judgment with the inappropriateness of CPR

in terminally ill patients, residents in training and other health care professionals may attempt what has been called “a slow code”; an apparent effort to resuscitate that is intentionally ineffective. Some attending physicians may insinuate this slow code by their demeanor and the suggestion that the reanimation attempt should be modest. The “slow code” is unethical; it fails to disclose the truth; it misguides the health care professional team who responsible for implementing the code; it diminishes the entire meaning of the medical act; and it is a waste of important resources. In addition, it gives a wrong message to physicians in training as to the extent of the medical praxis and the meaning of the medical profession in our society (28-29).

Clinical training is the area of end of life care is clearly a complex issue, which touches on many of the areas which are not strictly clinical science. Training in this area requires not only solid knowledge of the various medical conditions which are often seen in the medical praxis but also training in the diverse ethical concepts which provide the backbone for the practice of medicine. In addition competency in the legal aspects which are applicable to the scenario of futile care, the rules and regulations of the medical board of examiners of our island and techniques of communication with patients and family are part of what needs to be included in the curriculum. In addition basic tenets of professionalism are required such as empathy, veracity, honesty and respect for autonomy. All of these facets are considered and addressed in the accredited programs evaluated. The results suggest that our training programs do not effectively educate medical residents in end of life care.

Resumen

Los conocimientos y las destrezas de cómo implementar la orden de DNR (do not resuscitate) parece ser altamente variable. Hemos diseñado, validado e implementado un instrumento para evaluar conocimientos y destrezas de implementación de los residentes en las 8 instituciones de enseñanza acreditadas por el American Council of Medical Education (ACGME) localizadas en Puerto Rico. Participaron 136 residentes. Sólo el 93.3% juzgó necesario escribir la orden de DNR en el expediente clínico. El 88.1 % consideró apropiado sugerir un DNR al paciente o a la familia de un paciente con una enfermedad terminal. Si un paciente con pronóstico incierto insistía en un DNR, el 78.5% de los residentes opinó que el médico de cabecera era responsable de determinar si esta solicitud debía aceptarse, pero el 21.5% decidió que ésta era una responsabilidad del comité de ética. Cuando el paciente y los médicos estaban de acuerdo que el DNR era apropiado, la mayoría de los residentes en los hospitales del Norte opinaron que escribir la orden médica le correspondía al residente, residentes del suroeste adjudicaron esta responsabilidad al médico de cabecera. Si no había una orden de DNR firmada, más del 77.4% de los residentes de los hospitales del Norte y del Sur iniciarían CPR en un paciente comatoso, con cáncer avanzado, fallo de múltiples órganos

y sepsis. Sólo el 15% de los residentes en los hospitales del Oeste tomarían la misma decisión. Los conocimientos y la implementación del DNR deben mejorarse en todos los hospitales de enseñanza.

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