

Withholding Resuscitation: A New Approach to Prehospital End-of-Life Decisions

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Background: Emergency medical services (EMS) personnel often are not permitted to honor requests to withhold resuscitation at the end of life, particularly if there is no written do-not-resuscitate (DNR) order.

Objective: To determine whether EMS personnel from agencies implementing new guidelines would be more likely to withhold resuscitation from persons having out-of-hospital cardiac arrests than would personnel from agencies that did not implement the guidelines.

Design: Observational study in which 16 of 35 local EMS agencies volunteered to implement new guidelines for withholding resuscitation.

Setting: King County, Washington.

Patients: 2770 patients with EMS-attended cardiac arrest.

Intervention: New guidelines adopted by participating agencies permitted EMS personnel to withhold resuscitation if the patient had a terminal condition and if the patient, family, or caregivers indicated, in writing or verbally, that no resuscitation was desired.

Measurements: Proportion of resuscitations withheld in agencies that implemented new guidelines compared with those that did not.

Results: Emergency medical services personnel from agencies implementing new guidelines withheld resuscitation in 11.8% of patients (99 of 841 patients) having cardiac arrests, compared with an average of 5.3% (range, 4.2% to 5.9%) of patients (103 of 1929 patients) in 3 historical and contemporary control groups. Honoring verbal requests alone accounted for 53% of withheld resuscitations in the intervention group (52 of 99 patients) compared with an average of 8% (range, 7% to 9%) in the control groups (8 of 103 patients).

Limitations: The study was not a randomized, controlled trial; individual agencies chose whether to implement the guidelines.

Conclusions: Implementation of new guidelines was associated with an increase in the number of resuscitations withheld by EMS personnel. This increase was primarily due to honoring verbal requests.

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Emergency medical services (EMS) personnel arrive at a home to find an elderly, emaciated patient in cardiac arrest. Family members state that he had end-stage cancer and did not want life-sustaining measures to be taken. However, there is no formal written do-not-resuscitate (DNR) order. The emergency medical technicians (EMTs) remove the patient from bed, despite the now vehement and emotional objections of the family, and begin resuscitation.

This scenario, based on an actual event, shows a predicament sometimes faced by EMS personnel who arrive on the scene and find a patient with a terminal condition who has previously expressed the wish that no resuscitation be attempted. The response of EMS personnel to such patients is often inconsistent and depends on local guidelines, patient presentation, and type of DNR order.

As of 1999, 42 states had adopted formal protocols that allowed EMS personnel to withhold resuscitation efforts if the patient had a specific, state-approved prehospital DNR order (1). However, when this is lacking and when resuscitation wishes are conveyed by a different type of directive or by verbal request, EMS personnel usually begin resuscitation. An unwanted resuscitation effort may violate the patient's right to self-determination, cause suffering and emotional distress for the patient and the family, be troubling for EMS providers, and expend resources unnecessarily.

Discussions with providers in our EMS system and our personal experiences underscored the importance of this issue and prompted us to develop new guidelines that gave EMS personnel greater discretion to withhold resuscitation efforts in patients with terminal conditions, even in the absence of state-approved prehospital DNR documentation. The guidelines were implemented by some, but not all, EMS agencies in our county. We hypothesized a priori that EMS personnel from agencies implementing the guidelines would probably withhold resuscitation more often than those from agencies not implementing the guidelines, specifically because the guidelines allowed EMS personnel to honor verbal requests. We also hypothesized that EMS personnel would make decisions consistent with the guidelines and that they would report little difficulty in making these decisions.

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METHODS

Study Design, Setting, and Sample

This investigation was an observational study of persons having out-of-hospital cardiac arrests in King County, Washington (excluding Seattle), and incorporated historical and contemporary comparison groups (Figure). King County, excluding Seattle, comprises urban, suburban, and rural areas; has a population of approximately 1.2 million persons; and covers 2043 square miles. King County has a 2-tiered EMS response system that has been described previously (2). First-tier firefighter-EMTs are first to arrive on the scene and provide cardiopulmonary resuscitation and defibrillation; second-tier paramedics arrive next and provide advanced life support.

The study sample consisted of all cases of out-of-hospital cardiac arrest to which EMS personnel responded, except those for which DNR orders would not typically be pertinent (trauma, suicide, or drug overdose). Although the term *cardiac arrest* is used by EMS personnel to denote persons who are unconscious and do not have a pulse, there may be cardiac, respiratory, neurologic, or other causes for the patient's condition.

The institutional review board at the University of Washington approved the study. Written informed consent was not required. Verbal consent was obtained from EMS personnel before they were interviewed.

Intervention

Before 1998, patient care guidelines directed EMS personnel in King County to initiate resuscitation attempts in all persons having cardiac arrest, except those with signs of obvious death (lividity or rigor mortis) or those with a state-approved prehospital DNR directive. Other written directives were occasionally honored, although this was not endorsed. Verbal requests were rarely honored.

Context

Emergency medical services (EMS) personnel attending out-of-hospital cardiac arrests sometimes attempt to resuscitate patients who do not want life-sustaining measures.

Contribution

This study involving 2770 patients with EMS-attended cardiac arrests assessed outcomes of guidelines that permitted personnel to withhold resuscitation in patients with terminal illnesses when the patients or caregivers indicated, in writing or verbally, that they did not want resuscitation. Sixteen of 35 EMS agencies in King County, Washington, implemented the guidelines. Implementation and control agencies withheld resuscitation in approximately 11.8% and 5.3% of cardiac arrests, respectively. The difference was primarily due to honoring verbal requests.

Cautions

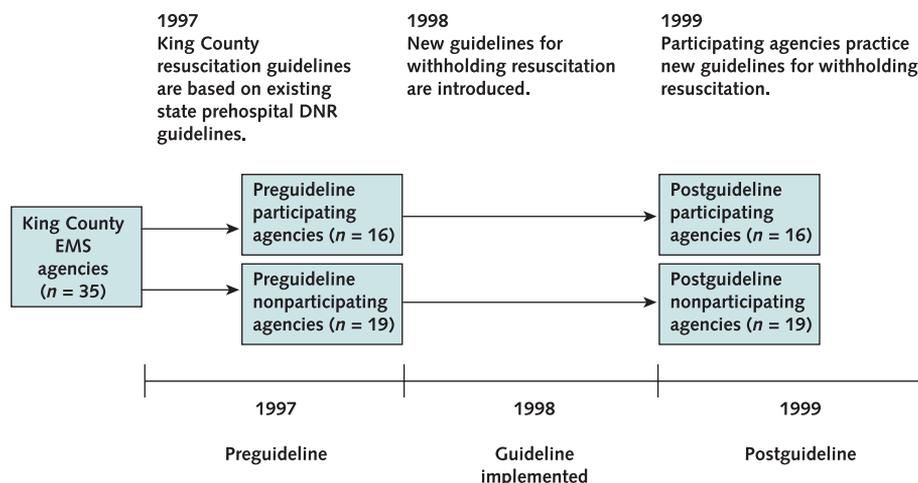
In this observational study, self-selected agencies volunteered to implement guidelines.

—The Editors

In 1998, 2 of the present authors, who work as paramedics in King County, proposed new guidelines to address the situation of patients with terminal conditions who did not desire resuscitation and did not have DNR paperwork. These guidelines allowed EMS providers to withhold resuscitation if 1) the patient had a preexisting terminal condition and 2) the patient, family, or caregivers indicated, in writing or verbally, that the patient did not want resuscitation.

A terminal condition was defined as one in which death was expected and for which the patient was under a

Figure. Study design.



"Participating agencies" were defined as those that agreed to implement the 1998 guidelines. "Nonparticipating agencies" were those that did not implement the guidelines. DNR = do not resuscitate; EMS = emergency medical services.

Table 1. Characteristics of Participating and Nonparticipating Agencies

Characteristic	Participating Agencies	Nonparticipating Agencies
Population of area served, <i>n</i> *	624 110	541 829
Basic life support providers, <i>n</i>	918	1007
Advanced life support providers, <i>n</i>	67	68
Basic life support alarms, <i>n</i>	50 073	35 712
Advanced life support alarms, <i>n</i>	14 443	14 891
Agencies, <i>n</i>	16	19
Area served, <i>square miles</i>	486.1	584.2

* As of the 2000 Census.

physician's care. Resuscitation wishes could be communicated through a state-approved prehospital DNR directive, other directive, or verbal request. Although the guidelines were valid for both EMTs and paramedics, we expected that they would be most useful to EMTs, who are first to arrive at the scene. Physician consultation was not necessary to invoke the guidelines.

Assistance in developing the guidelines and training program was provided by the King County medical director, local physicians, paramedics, EMS administrators, and a legal consultant (Johnson BR. Liability of EMS personnel for honoring or failing to honor a "Do Not Resuscitate" (DNR) order. Legal opinion paper presented to King County Emergency Medical Services. May 1998).

The guidelines and training were offered to all 35 EMS agencies in King County. Participation was voluntary, and each agency's fire chief made the final decision. Ultimately, 16 agencies chose to participate. Those that did not participate cited legal and risk management concerns. Characteristics of participating and nonparticipating agencies and the populations they serve are shown in Table 1. The 35 agencies have the same countywide medical director, continuing education program, patient care guidelines, and criteria-based dispatch guidelines.

Personnel from participating agencies were trained in 1998. Training consisted of a printed manual, written guidelines, a 2-hour lecture and discussion, and a competency quiz. Approximately 900 EMTs and 70 paramedics were trained.

Because some agencies participated and some did not, we were able to compare EMS care between these groups. We compared resuscitation decisions for 1-year periods before and after the introduction of the guidelines: preguideline (calendar year 1997, the last full year before guideline implementation) and postguideline (calendar year 1999, the first full year after guideline implementation). Cases

occurring in 1998 were excluded because training took place that year. This classification generated 4 groups: preguideline nonparticipating agencies, preguideline participating agencies, postguideline nonparticipating agencies, and postguideline participating agencies. Within these groups, each case of cardiac arrest was classified into 1 of 3 categories: attempted resuscitation, no resuscitation due to signs of irreversible death, or withheld resuscitation. Withheld resuscitation consisted of cases where resuscitation was withheld on the basis of either a written DNR order or verbal request.

Data Collection

For each EMS response, information was collected from the medical incident report that was completed by EMTs and paramedics. After implementation of the guidelines, 1 of the authors conducted interviews to collect information on cases of withheld resuscitation. Each interview lasted approximately 15 minutes and included 30 questions about the patient, scene, family members, and actions of EMS personnel. The EMS personnel obtained most information from family members (for example, the patient's history and diagnosis and the reason for the 911 telephone call), although no standard query was used. When possible, the interview took place within 1 day of the telephone call, but there were occasional delays of 1 week or more. Interviews were conducted for 51 of 99 cases of withheld resuscitation. The EMS officer in charge of patient care for each case was interviewed. No persons declined to be interviewed.

Statistical Analysis

Descriptive statistics summarize the characteristics of the patient sample. A multinomial logistic regression model was used to estimate probabilities for the 3 nominal response categories of attempted resuscitation, no resuscitation, and withheld resuscitation. Independent variables included factors of time (preguideline or postguideline implementation), participating agency (yes or no), patient location (private residence, nursing home, or other), patient sex (male or female), a covariate of patient age in years divided by 100, and an interaction term of time and participating agency. Individual agency identification was not tabulated for each observation or medical incident report; therefore, a random-effects term for agency was not entered into the model. A multiple imputation method using the expectation-maximization algorithm for continuous and categorical data was used for missing data in 89 cases of age and 46 cases of sex. Chi-square tests compared resuscitation wishes (verbal or written) with study group and patient location. Summary statistics were performed with InStat for Macintosh, version 3.0 (GraphPad Software, San Diego, California). Multiple imputations, regression models, and chi-square tests were evaluated by using R, version 2.2.0 (R Core Development Team, 2005) (3).

Table 2. Characteristics of Patients Who Had Cardiac Arrest according to Resuscitation Effort*

Characteristic	Attempted Resuscitation (n = 1335)	Irreversible Death; No Resuscitation Attempted (n = 1233)	Withheld Resuscitation (n = 202)	Total (n = 2770)
Mean age (SD), y†	69.0 (15.2)	68.9 (18.3)	78.9 (13.0)	69.7 (16.6)
Men, n/n (%)	831/1335 (62)	660/1193 (55)	89/196 (45)	1580/2724 (58)
Private home, n/n (%)	875/1335 (65.5)	1003/1233 (81.3)	113/192 (58.9)	1991/2760 (72.1)
Dispatch level (joint first-tier and second-tier response), n/n (%)‡	898/1043 (86.1)	553/1115 (49.6)	149/188 (79.3)	1600/2346 (68.2)

* The number (denominator) on which each percentage is based is the total number of cases for which data were available.

† Data on age were available in 1335 cases in the attempted resuscitation group, 1150 cases in the irreversible death group, and 196 cases in the withheld resuscitation group.

‡ First-tier personnel only (emergency medical technicians) are dispatched to calls for persons presumed "dead on arrival," whereas joint first- and second-tier personnel (emergency medical technicians and paramedics) are dispatched to all other cardiac arrest calls.

Role of the Funding Source

The funding source had no role in the design, analysis, or interpretation of the study or in the decision to submit the manuscript for publication.

RESULTS

Resuscitation Data

During the 2 years of the study (1997 and 1999), 2770 persons had nontraumatic, EMS-attended, out-of-hospital cardiac arrests. The characteristics of the patient sample are shown in Table 2.

Across all agencies, resuscitation was withheld in 5.9% (78 of 1333) of patients having cardiac arrests before guideline implementation and in 8.6% (124 of 1437) of patients having cardiac arrests after guideline implementation. Specifically, resuscitations were withheld from 11.8% of patients in the postguideline participating group compared with 5.8%, 5.9%, and 4.2% in the preguideline nonparticipating group, preguideline participating group, and postguideline nonparticipating group, respectively (Table 3).

The analysis using multinomial logistic regression indicated that the probability of withholding resuscitation varied by time period (preguideline or postguideline) and agency participation ($P < 0.001$ for the agency participation \times time interaction term for withheld resuscitation vs. attempted resuscitation and withheld resuscitation vs. no resuscitation). On the basis of the results of the model, the postguideline participating group more than doubled its probability of withholding resuscitation com-

pared with the other study groups after controlling for patient age, sex, and location.

Table 4 shows the means by which resuscitation wishes were conveyed (state directive, other directive, or verbal request). The difference between the postguideline participating group and each of the other 3 groups is largely due to the honoring of verbal requests, which made up 53% (52 of 99) of withheld resuscitations in the former group and only 8% (8 of 103) in the latter groups ($P < 0.001$). Thus, when responding to verbal requests, the postguideline participating group increased its probability of withholding resuscitation more than 6-fold compared with other study groups.

In the postguideline participating group, there was an association between type of directive and patient location. Patients residing in nursing care facilities were more likely to have a written directive, whereas those residing in private homes were more likely to have family members verbally express resuscitation wishes ($P = 0.003$) (Table 5).

Interviews with EMS Personnel

Emergency medical services personnel in the postguideline participating group were interviewed for 51 of 99 cases of withheld resuscitation. The characteristics of patients seen by interviewed and noninterviewed EMS personnel were similar (interviewed vs. noninterviewed: mean age, 77.1 years vs. 80.3 years; male sex, 41% vs. 43%; private home, 61% vs. 58%; verbal request to withhold resuscitation, 52% vs. 54%).

Both conditions necessary to invoke the guidelines (terminal condition and request to withhold resuscitation)

Table 3. Type of Resuscitation Effort according to Study Group*

Variable	Preguideline Nonparticipating Agency (n = 570)	Preguideline Participating Agency (n = 763)	Postguideline Nonparticipating Agency (n = 596)	Postguideline Participating Agency (n = 841)
Attempted resuscitation, n (%)	304 (53.3)	390 (51.1)	280 (47.0)	361 (42.9)
Irreversible death; no resuscitation attempted, n (%)	233 (40.9)	328 (43.0)	291 (48.8)	381 (45.3)
Withheld resuscitation, n (%)	33 (5.8)	45 (5.9)	25 (4.2)	99 (11.8)

*The number on which each percentage is based is the total number of cases in each study group.

Table 4. Type of Request To Withhold Resuscitation according to Study Group*

Variable	Preguideline Nonparticipating Agency (n = 33)	Preguideline Participating Agency (n = 45)	Postguideline Nonparticipating Agency (n = 25)	Postguideline Participating Agency (n = 99)
State EMS DNR directive, n (%)	6 (18)	9 (20)	3 (12)	4 (4)
Other written directive, n (%)	24 (73)	33 (73)	20 (80)	43 (43)
Verbal request, n (%)	3 (9)	3 (7)	2 (8)	52 (53)

* The number on which each percentage is based is the total number of cases in each study group for which requests to withhold resuscitation were honored. DNR = do not resuscitate; EMS = emergency medical services.

were documented on the medical incident report in all cases of withheld resuscitation in the postguideline participating group. Interviews with EMS providers supported the assertions made on the medical incident report; in no case was there a discrepancy, although the interviews often provided more detail. Of the 51 patients, 18 (35%) had terminal cancer; 32 (63%) had another terminal condition, such as renal failure; and 1 had an unknown terminal condition with hospice in attendance. Seven patients were said to be in a persistent vegetative state. Forty-five of the patients (88%) were in cardiac arrest on EMS arrival; the remainder progressed to cardiac arrest within minutes of EMS arrival. Communication of resuscitation wishes by either written or verbal means was provided in all cases—by family in 34 cases (67%) and by staff or caregivers in 17 cases (33%).

The EMS personnel who were interviewed indicated that they had little difficulty in making decisions about withholding resuscitation on the basis of the guidelines. Forty-six (90%) rated the decision to withhold resuscitation as “easy,” 4 rated it as “moderate,” and none found the decision “difficult.” Emergency medical services personnel indicated that the guidelines affected their decision to withhold resuscitation. Thirty-two of 51 (63%) said they would have initiated or continued a resuscitation effort in a similar situation before guideline implementation, particularly in cases in which there was a verbal request only (81%). The EMS personnel who were interviewed reported that there were no objections, complaints, or disagreements among family members or other persons on the scene when resuscitation efforts were withheld, nor was any

such objection noted on the medical incident report of any case.

Paramedic units were initially dispatched in 48 of 51 cases (94%) about which EMS personnel were interviewed. The EMTs at the scene canceled paramedic units 23 times (48%) while the units were en route. In the remaining 25 cases, paramedics arrived and assisted the family but did not override the decision of the EMTs and begin resuscitation.

Persons who called 911 gave reasons in 41 of 51 cases. In 23 residences, the most common reasons were “didn’t know what else to do” (26%), wanted confirmation of death (22%), and needed medical assistance (48%). The latter category included patients whose dying process included coughing or vomiting blood, seizures, agonal respirations, or severe dyspnea. In all 6 nursing home cases, staff called 911 because they had not determined the patient’s DNR status. The remaining 12 cases took place in adult family homes and reflected a mix of the aforementioned reasons. In addition, 3 people called because they thought 911 notification was required by law.

DISCUSSION

In this observational study, 16 of 35 EMS agencies in King County implemented guidelines permitting EMS personnel to withhold resuscitation from persons having out-of-hospital cardiac arrests. The implementation of these guidelines was associated with a statistically significant increase in the number of resuscitations withheld by EMS personnel in participating agencies compared with those in nonparticipating agencies or historical experience. This increase was primarily due to honoring verbal requests. Medical incident reports and interviews indicated that EMS personnel appropriately followed the guidelines for withholding resuscitation.

Previous studies (4–6) indicate that EMS assistance is requested during some cases of cardiac arrest even when resuscitation is not wanted. In our study, a telephone call to 911 was made for various reasons, including the need for medical assistance or for confirmation of death.

Means of conveying resuscitation wishes range from a prehospital DNR order to a verbal request. In metropolitan Toronto, Canada, 70% of DNR requests were verbal

Table 5. Type of Request To Withhold Resuscitation in the Intervention Group according to Patient Location

Variable	Private Home (n = 50)	Nursing Facility (n = 30)	Other Location (Public Place, Medical Office, or Unknown) (n = 19)
Written directive, n (%)	17 (34)	22 (73)	8 (42)
Verbal request, n (%)	33 (66)	8 (27)	11 (58)

(6) compared with approximately 50% in this study. In the absence of formal written DNR documentation, EMS personnel typically attempt resuscitation. In our study, most EMS personnel who were interviewed stated that they would have initiated resuscitation in a similar situation before the implementation of the new guidelines. This finding is supported by a national survey of more than 1500 EMTs in which 89% stated they would honor a state-approved advance directive, 10% stated they would honor a verbal report of an advance directive, and only 4% said they would honor an “unofficial” document (7). There is no mention of honoring a verbal request alone.

Emergency medical services personnel who are prevented from honoring a request to withhold resuscitation may act in ways that are in no one’s interest. The authors of the Toronto study wrote, “In several cases resuscitation was initiated despite the repeated objections of caregivers. In the face of these objections, the paramedics sometimes had to move the patient to the ambulance, out of sight of the caregivers, to begin resuscitation, knowing full well that this delay would render the attempt futile” (6).

The issue of unwanted resuscitation has sometimes been addressed by educating families not to call 911 (6). This approach may be unrealistic; families overwhelmed by the realities of death may call 911 regardless of instructions. Interviews with EMS personnel indicated that almost 80% of calls from private homes were initiated because family members sought medical assistance or “didn’t know what else to do.” Telling families not to call 911 may also deprive them of the compassionate support that EMS personnel can provide. The act of calling 911 for help should not lead to an unwanted resuscitation.

Another approach to limit unwanted resuscitation is a statewide prehospital DNR directive. However, a survey conducted 6 years after implementation of the directive in our state found that 60% of physicians did not know that this directive was required in the prehospital setting (8). In the intervention group of our study, only 4% of patients in whom resuscitation was withheld had the state directive, whereas 43% had a different type of written advance directive. Permitting EMS personnel to honor various written directives will not address every situation; more than 50% of the resuscitation requests in our study were conveyed by verbal statements alone.

Such measures as instructing families not to call 911 or implementing a statewide prehospital DNR plan will prevent some unwanted resuscitation attempts. However, these measures probably will not eliminate the problem. The guidelines we described provide a well-received and locally implementable approach that addresses the issue at the level of the EMS provider; it is at this level that decisions must be made if the other strategies have failed. Since the completion of the study in 1999, the withholding resuscitation program has continued in King County and is currently being expanded to include agencies that did not

initially participate. We are not aware of other EMS programs in the United States that permit EMS personnel to withhold resuscitation by using similar guidelines.

This investigation has several limitations. The 16 participating agencies were not selected randomly but voluntarily implemented the guidelines. The remaining agencies declined to participate, citing legal and risk management concerns. Consequently, the increased proportion of withheld resuscitations after guideline implementation may be specific to agencies that actively use the guidelines and perhaps cannot be generalized to other agencies. The self-selecting nature of the study groups can lead to unrecognized clustering factors that may mask or lend false significance to some effects (9).

A second limitation is that not all EMS providers who withheld resuscitation were interviewed. However, noninterviewed personnel, according to characteristics collected from the medical incident reports, were similar to those who were interviewed. A third limitation is that bias may have been introduced because data obtained from the medical incident reports were collected by the authors, who were not blinded to the study group. A fourth limitation is the possibility of inaccurate statements given by EMS personnel in the medical incident reports and interviews.

Finally, although the guidelines for withholding resuscitation were well received by EMS personnel, the impact on family members and caregivers was not well studied. The EMS personnel who were interviewed did not report any objections by family or caregivers when resuscitations were withheld; in fact, there were anecdotes relaying the gratitude of family members for the support provided by EMS personnel. However, this was not investigated systematically. Interviews with family members and caregivers are the next step in evaluating this program.

In conclusion, the implementation of guidelines for withholding resuscitation was associated with an increase in the proportion of withheld resuscitations, primarily due to honoring verbal requests. The EMS personnel appropriately followed the guidelines and indicated that they had little difficulty making these decisions. Of importance, the program is continuing in the original agencies, and implementation has begun in those agencies that did not initially participate. The success of this program suggests that it could be incorporated into a community-wide approach to expected natural deaths occurring outside of a hospital. We believe that such a program, when carried out appropriately within a supportive EMS infrastructure, can improve care at the end of life by preserving patient autonomy and diminishing suffering. We feel these features benefit the patients, their families, the EMS providers, and the community as a whole.

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