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Emergency Nurses' Perception of Department Design  
as an Obstacle to End-of-Life Care

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A thesis submitted to the faculty of  
Brigham Young University  
in partial fulfillment of the requirements for the degree of  
Master of Science

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## ABSTRACT

### Emergency Nurses' Perception of Department Design as an Obstacle to End-of-Life Care

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**Introduction:** Of the 119.2 million visits to the emergency department (ED) in 2006, it was estimated that about 249,000 visits resulted in the patient dying or being pronounced dead on arrival. In two national studies of emergency nurses' perceptions of end-of-life (EOL) care, ED design was identified as a large and frequent obstacle to providing EOL care. The purpose of this study was to determine the impact of ED design on EOL care as perceived by emergency nurses.

**Methods:** A national, geographically dispersed, random sample of 500 members of the Emergency Nurses Association were sent a 25-item questionnaire regarding ED design as it impacts EOL care. Inclusion criteria were nurses who could read English, worked in an emergency department, and had cared for at least one patient at the EOL. Descriptive statistics were calculated for the Likert-type and demographic items. Open-ended questions were analyzed using content analysis.

**Results:** After two mailings yielding 198 usable responses, nurses did not report ED design to be as large an obstacle to EOL care as previous studies had suggested. Nurses did report the ED design helped EOL care at a greater rate than it obstructed EOL care. Nurses also believed they had little input into unit design or layout changes. The most common request for design change

was private places for family members to grieve. Thirteen nurses also responded with an optional drawing of suggested emergency department designs.

Discussion: Overall, nurses reported some dissatisfaction with ED design, but also believed they had little to no input in unit design improvement. Improvements to EOL care might be achieved if ED design suggestions from emergency nurses were considered by committees that oversee remodeling and construction of emergency departments. Further research is needed to determine the impact of ED design on EOL care in the emergency department.

Keywords: *Emergency Department, Design, Nurses' Perception, End-of-Life*

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## Emergency Nurses' Perception of Department Design as an Obstacle to End-of-Life Care

The emergency department (ED) is often a forgotten part of the health care system until individuals or their family members become ED patients. The National Hospital Ambulatory Medical Care survey reported 119.2 million ED visits in 2006 (Pitts, Niska, Xu, & Burt, 2008). These 119.2 million visits average to be about 40.5 visits per 100 people nationally (Pitts et al.). These numbers represent large increases over 1996 statistics that reported 90.3 million emergency department visits, or a rate of 34.2 visits per 100 people (Pitts et al.).

Increasing visit rates indicate that emergency departments are becoming the frontline of health care for more Americans every year. With increasing visit rates come more patients who are at the end of life (EOL) or are dying. Of the 119.2 million visits to the emergency department, it was estimated that about 249,000 visits resulted in the patient dying or being pronounced dead on arrival (Pitts et al.).

Because of the high numbers of deaths occurring in emergency departments, two national studies looked at the largest and most frequent obstacles perceived by emergency nurses relating to EOL care. Using a random national sample of 300 emergency nurses, Heaston, Beckstrand, Bond, and Palmer (2006) reported that the item, "*Poor design of emergency departments not allowing for privacy of the dying patient or the grieving family members,*" ranked as the third highest obstacle to providing EOL care in emergency departments. In a follow-up study that included frequency of occurrence data, Beckstrand, Smith, Heaston, and Bond (2008) had the same obstacle of poor unit design ranked second overall out of 28 obstacles. This item had a magnitude score (obstacle size multiplied by obstacle frequency) of 11.01 out of a possible

11.45. There were no other articles found addressing emergency department design and layout affecting EOL care in emergency departments.

Experienced emergency nurses know that one of the major concerns with department design is patient privacy. Patient privacy has always been an issue in health care but privacy became a part of federal law with the passing of the health insurance portability and accountability act of 1996 (HIPAA). The major goal of HIPAA was to ensure that patients' health information was properly protected while still allowing for the proper flow of health information needed to provide high quality health care (U.S. Department of Health and Human Services, 2008). Concern for privacy in often overcrowded emergency departments includes basic layout problems such as the use of curtains between patients with no provision for private communication or private care, and limited space provided for family members to be present. Understandably, the layout of emergency departments is something that cannot be easily changed, but improvements that impact the care of dying patients should be a consideration when planning for new or remodeled departments.

Because of the increasing numbers of patients coming to emergency departments who are dying, determining the impact of ED design on EOL care was needed. Research questions for this study included:

1. What is the perception of emergency nurses regarding how frequently ED design obstructs their ability to care for dying patients?
2. What is the perception of emergency nurses regarding how frequently ED design helps or supports their ability to care for dying patients?
3. What is the perception of emergency nurses regarding how difficult it would be to fix the largest ED design problems as they affect EOL care?

4. What is the perception of emergency nurses regarding how much input or influence they have in the current layout or design of their emergency department?
5. What is the perception of emergency nurses regarding the most helpful potential design changes to improve EOL care in an emergency department?
6. What design and layout suggestions do emergency nurses have for emergency departments?

## Methodology

### Subjects

Institutional Review Board approval was obtained for this study. A geographically dispersed random sample of 500 emergency nurses was obtained from the National Emergency Nurses Association (ENA). As of January 2010, there were 35,757 (ENA, 2010) members of ENA so this 500 member sample represented approximately 1.4 % of total ENA membership. The sample size was deemed appropriate because it exceeded 1% of total ENA membership and was a randomly selected national sample of emergency nurses.

ENA members who were considered eligible for the study had worked at some time in an emergency department, lived in the United States, were able to read English, and had cared for at least one patient at the EOL in an emergency setting. Consent to participate was assumed upon return of the questionnaire.

### Instrument

The questionnaire, “*The Emergency Nurses’ Perceptions of Department Design as an Obstacle to End-of-Life Care*” was developed using information gathered from a literature review, previously completed research, and from expert opinion. The questionnaire was piloted



by 24 experienced emergency nurses at two separate hospitals in the western United States. Minor changes in wording were made based on the recommendations of the nurses who piloted the tool.

The final questionnaire contained 25 total items. These included four Likert-type questions with an option to add additional comments for each item, one item allowing nurses to rank potential design changes they would like in their emergency department, and four open ended questions about how frequently ED design has obstructed or helped in the care of EOL patients. Subjects were also asked to report how difficult or easy it would be to make changes to their emergency departments and to report about the influence emergency nurses had on current layout or design features in their departments. Eleven demographic questions were included with an optional area to sketch a layout or design suggestion.

#### Procedure

A random sample of registered nurses who were members of ENA was obtained. Included in the first mailing to the nurses was a letter of explanation, a copy of the questionnaire, a one dollar bill as compensation for completion of the questionnaire, and a self-addressed stamped return envelope. The second mailing, which was sent to those not responding to the first mailing, included a cover letter, a copy of the questionnaire, and a self-addressed stamped return envelope. Results were entered into SPSS® software. Data was then analyzed for frequencies and measures of central tendency and dispersion. Open ended text comments were analyzed for common themes.

#### Results

Out of 500 potential respondents, a total of 215 RNs returned questionnaires. Sixteen questionnaires were returned undeliverable and 1 questionnaire was returned unanswered with

the subject stating she was ineligible. Therefore, usable responses were received from 198 nurses for a response rate of 40.9% after two mailings.

Of those subjects who responded to gender, 80.7% ( $n = 159$ ) were female and 19.3% ( $n = 38$ ) were male. The average age of participating nurses was 47.3 years ( $SD = 10.27$ ) with a maximum of 68 years and a minimum of 23 years. Other demographic data including education, certification, and years as a registered nurse are reported in Table 1.

The first item on the questionnaire was, *“How frequently has the design of your emergency department obstructed your ability to care for dying patients and/or their families?”* The range of choices were from 0 to 6 with 0 = never, 1 = less than once a month, 2 = once a month, 3 = 2 - 3 times a month, 4 = once a week, 5 = 2 - 3 times a week, and 6 = daily (or every time I work). The score for this item was 1.45 ( $SD = 1.55$ ;  $n = 194$ ) meaning that this sample of ED nurses reported the design of their emergency department obstructed their ability to care for dying patients or their families at a frequency of between less than once a month to once a month.

Due to the lack of previous information regarding how ED design affects EOL care, nurses were allowed to make comments to items for clarification ( $n = 40$ ). After analyzing comments by nurses on this item two themes emerged. First, the issue of lack of privacy for dying patients and grieving families was exemplified by one emergency nurse who wrote, *“Some of our rooms are snug and make it difficult for everyone to physically fit. A few of the rooms are separated by curtains, allowing other patients and families to hear the family or a dying patient grieve.”* A second theme pertained to the physical layout of the department with the lack of space for family members at the bedside or in the waiting room. One nurse’s example of a poorly planned department layout was illustrated by her statement, *“One bad thing is, when*

*going from the trauma or code room to CT scan or elevators, [we always have to] pass by the family room.”*

The second item on the questionnaire was, *“How frequently has the design of your ED helped or supported your ability to care for the dying patients and/or their families?”* This item had the same frequency scale ranging from 0 to 6 with 0 = never and 6 = daily or every time I work. The score for this item was 2.25 (SD = 2.09;  $n = 189$ ) meaning that the design of the emergency department helped emergency nurses care for the dying patient or family between at least once a month and 2 - 3 times a month.

Similar to the first item, open-ended comments for this item also discussed both space and privacy. Nurses’ written comments included, *“We have a ‘family’ room which has easy access from the lobby and is located in a ‘corner’ position in our ED.”* Another nurse wrote, *“We have private rooms with doors that are easily accessible and can be used for the dying patient’s family.”*

The third item asked, *“How difficult or easy would it be to fix the largest design or layout problems in your emergency department?”* This item was a scaled question with 7 possible responses, 1 = impossible, 2 = very difficult, 3 = difficult, 4 = somewhat difficult, 5 = somewhat easy, 6 = easy, and 7 = very easy. The mean score for this item was 2.90 (SD = 1.39;  $n = 187$ ); nurses reported that on average it would be difficult for their hospital to fix the largest design or layout problem in the emergency department. In fact, when looking at all the nurses’ responses for this item, 160 (85.6%) reported it would be somewhere between difficult to impossible to fix design problems in their emergency department.

Fifty nurses made comments associated with this item with two opposite themes emerging. The most common comment referred to the lack of space, including both the lack of

space in their current emergency department and the lack of space for potential remodeling. The second theme noted that many departments where these nurses currently work have recently been remodeled, are in the process of being remodeled, or recently built new.

The fourth item was, *“How much input or influence do you have (or have you had) in the design or layout of your ED?”* This item was a scaled question with 5 possible responses: 1 = none, 2 = very little input, 3 = some input, 4 = much input, 5 = very much input. Mean score was 2.14 (SD = 1.15;  $n = 197$ ) indicating that nurses believed they had between very little input and some input on the design or layout of their emergency department. Nurses commenting on this item ( $n = 24$ ) shared they either had no input or their input wasn't listened to during design changes or remodels in their emergency department. One nurse expressing frustration wrote, *“We just built a brand new emergency department and all of our suggestions were ignored. Things like [suggestions for] placement of sharps containers and automatic door openers have not been addressed.”*

The fifth item on the questionnaire was, *“Please rank the following potential changes starting with the most helpful to the least helpful as they might apply to your ED.”* The listed choices included: 1) more rooms for observation; 2) more private rooms for patients; 3) a chapel near the emergency department; 4) private places for family members to grieve; and, 5) more room for family presence such as during resuscitation. Space was provided for nurses to write in any other changes they might suggest. Items were entered by recording their rank number so that the nurses' first, or top, choice for improvement was recorded as a 1. The item with the lowest scoring mean number was seen as the most commonly selected design change (see Table 2). *“Private places for family members to grieve”* received the lowest mean score of 2.45 (SD = 1.22;  $n = 176$ ), which correlates with the findings in the studies by Beckstrand et al. (2008) and

Heaston et al. (2006). The least chosen suggestion for change was “*A chapel near the emergency department.*”

A final optional item included on the questionnaire asked the nurses to sketch out their perfect emergency department layout or design. Thirteen nurses submitted sketches along with their descriptions of how their drawn design improved the emergency department. Design options ranged from simple to complex, with nine drawings exhibiting elaborate attention to detail (see Figures 1 & 2).

### Discussion

The sample was nationally randomized, nurses received two mailings, and there was a good return rate; therefore, the results can be generalized to emergency nurses who are members of ENA. The impact of ED design on EOL care did not seem to have the magnitude or frequency as originally thought using our provided frequency scales. The two previous studies Beckstrand et al. (2008) and Heaston et al. (2006) both had poor design of emergency departments that ranked second and third, respectively, as obstacles reported by emergency nurses regarding EOL care. The difference in results for this item between previous studies and this study could be attributed to how the question was worded. For example, in the two previous studies the item wording was, “*Poor design of emergency departments which do not allow for privacy of dying patients or grieving family.*” Emergency nurses in the two previous studies might have been responding to the words *privacy* and *grieving* more than they were responding to the words *poor design* thus rating these items as large obstacles.

Another consideration is that although the choices for item one were based on frequency of impact of design on EOL care, individual nurses were not asked to report their frequency of caring for EOL patients. Instead, the nurses were only asked how many total hours they worked

per week; therefore, it is possible that a nurse reporting a low frequency of design problems might only work a few shifts a month and, therefore, only took care of a very few or no dying patients each month.

It was surprising that emergency nurses reported the emergency department design helped or supported their ability to care for dying patients at a rate between once a month and 2 - 3 times a month. These findings could be credited to emergency nurses adapting to the department where they work and amplifying the positive aspects of the department design. It could also be considered that many of the nurses reporting helpful design layouts could be working in departments that have been recently built or remodeled, changing many of the aspects that were previously perceived as negatives. One study that looked at emergency nurses' satisfaction both before and after a remodeling of an emergency department indicated nurses had increased confidence and decreased stress levels after the remodel as compared to before the remodel (Judkins, 2003).

Not surprisingly, many nurses believed they had little input or influence in the design or layout of their department. According to the position statement from ENA on EOL care, emergency nurses should work with their institutions to develop programs and be involved in research to provide better care to patients during EOL care (ENA, 2010).

Many emergency departments have been designed using concepts developed in previous decades and for much lower patient volumes than what are commonly seen today (Zilm, 2007). Much of this perceived difficulty could be due to the lack of space and financial means that are necessary to resolve such large issues.

### Limitations

In retrospect, asking nurses what year their emergency department was built or remodeled might have assisted in the analysis of why specific emergency nurses were either satisfied or dissatisfied with the design and layout of their emergency department. Nurses could also have been specifically asked how many shifts they worked and how many dying patients they cared for in a month. Increased specificity would have given clarity to the analysis of items. For example, if a nurse reported that design obstructed care of a dying patient once a month and that same nurse only cared for two dying patients in that same time period then the significance of that design obstruction would have greatly increased.

### Implications for Emergency Nurses

Obstacles such as ED design problems can negatively impact the ability of a nurse to provide excellent care and might cause work related stress to these nurses who work in an already high stress area. Department design changes should always be reviewed and approved by the emergency nurses working in that department. Emergency nurses should be viewed as an essential resource for administrators, architects, and hospital design teams as they implement their ideas for layout and design changes of emergency departments. Further evaluation regarding nurses' perceived difficulty with design changes to their departments is needed.

This study supports earlier work showing emergency nurses are interested in providing excellent EOL care. Hospital administrators, ED managers, and hospital design teams need to actively seek input from nurses regarding ED designs prior to building or remodeling emergency departments. In this way, the best care can be provided to both the dying patients and their families. Listening to and implementing emergency nurses' recommendations regarding emergency department design might help alleviate one aspect of the burden of caring for dying

patients. Listening to emergency nurses' suggestions could contribute to a better design and layout of emergency departments.

### Conclusions

Although emergency design did not impact EOL care as significantly as we presumed prior to conducting this study, it did negatively impact emergency nurses' care of dying patients at a rate of more than once a month. EOL care to dying patients in emergency departments might be enhanced if improvements to ED design could be realized. Committees that oversee the remodeling and construction of emergency departments should seek and incorporate the design suggestions of emergency nurses.



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Table 1

**Demographics**

<b>Table 1 Demographics of Nurses. n = 500, 215 returned, 198 usable, 17 not eligible = 40.9% response rate.</b>			
<b>Characteristics</b>			
Sex	<i>n</i>	<i>%</i>	
Female	159	(80.3%)	
Male	38	(19.2%)	
Did not report	1	(0.5%)	
	<u>M</u>	<u>SD</u>	Range
Age	47.3	10.3	23-68
Years as RN	19.8	12.3	1-47
Years in Emergency Department	15.0	10.7	0-45
Hours worked/week	31.1	14.4	0-80
Number of beds in Emergency Department	30.0	17.5	4-88
Dying patients cared for:			
>30			
21 - 30	58.0%		
11 - 20	6.7%		
5 - 10	13.0%		
<5	11.4%		
	9.8%		
Highest degree:			
Diploma	5.2%		
Associate	23.8%		
Bachelor	52.3%		
Master-Nursing	18.2%		
Doctoral	0.5%		
Ever certified as CEN	<i>n</i>	<i>%</i>	
Yes	109	(57.1%)	

No	82 (42.9%)		
Currently CEN	<u>n</u> <u>%</u>		
Yes	30 (25.6%)		
No	87 (74.4%)		
Years as CEN	8.88	7.77	1-30
Practice area:	<u>%</u>		
Direct Care/Bedside Nurse	39.5		
Staff/Charge Nurse	33.7		
Clinical Nurse Specialist	1.6		
Other (Manager, Educator, etc.)	26.8		
Hospital type:	<u>%</u>		
Community, non-profit	61.5		
Community, profit	18.8		
University Medical Center	11.5		
State Hospital	1.0		
County Hospital	2.6		
Military Hospital	1.6		
Other	3.0		

Table 2

**Potential Design Changes Ranked from Lowest to Highest Mean Score**

<b>Potential Design Changes</b>	<b>Mean</b>	<b>SD</b>	<b>n =</b>
1. Private places for family members to grieve	2.45	1.22	176
2. More private rooms for patients	2.66	1.53	162
3. More room for family presence such as during resuscitation	2.77	1.39	172
4. More rooms for observation	3.06	1.42	160
5. A chapel near the emergency department	3.83	1.44	164
Other:			
Larger rooms			4
Bereavement staff or Chaplin available			2
Replace curtains with doors			2





Figure 2

**Potential Design Changes Drawing Example 2**

