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Applied Nursing Research 19 (2006) 182–190

Applied Nursing Research

www.elsevier.com/locate/apnr

Original Article

# Communication boards in critical care: patients' views☆

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Received 14 September 2004; accepted 23 September 2005

**Abstract**

**Background:** Some patients receiving mechanical ventilation experience an intensified need to communicate while their ability to do so is compromised as the endotracheal tube prevents speech. Although the use of a communication board to enhance communication with such patients has been suggested, few descriptive or empirical studies have addressed the content and format of these devices or of patients' perspectives on decreasing frustration with communication.

**Objectives:** The objectives of this study were: (1) to identify the perceived level of frustration of patients receiving mechanical ventilation while they attempt to communicate; (2) to determine patients' perceived level of frustration if a communication board had been used; and (3) to describe patients' perceptions of the appropriate content and format of a communication board.

**Methods:** Twenty-nine critically ill patients who were extubated within the past 72 hours were included in this descriptive study. Subjects participated in a 20- to 60-minute audiotaped interview consisting of questions about their perceived level of frustration when communicating with and without a communication board and their thoughts about the appropriate content and format of a board. Transcripts were analyzed by questions for meaning and overall themes.

**Results:** Sixty-two percent ($n = 18$) of patients reported a high level of frustration in communicating their needs while receiving mechanical ventilation. Patients judged that their perceived level of frustration in communicating their needs would have been significantly lower ($P < .001$) if a communication board had been offered (29.8%) than if not (75.8%). Most patients (69%; $n = 20$) perceived that a communication board would have been helpful, and they also identified specific characteristics and content for a communication board. A communication board may be an effective intervention for decreasing patients' frustration and facilitating communication.

**Conclusions:** Most patients receiving mechanical ventilation experienced a moderate to a high level of frustration when communicating their needs. In this study, a communication board, if used patiently during mechanical ventilation, has been shown to alleviate frustration with communication. Patients have specific ideas about what terms and ideograms are useful for a communication board. Further research is needed to test the effects of a communication board and other methods of facilitating communication on outcomes such as satisfaction and anxiety of patients, adequate and appropriate management of pain, and length of mechanical ventilation time and hospital stay.



## 1. Background

Patients receiving mechanical ventilation have reported communication difficulties as their number one problem while intubated (Gries & Fernsler, 1988; Johnson & Sexton,

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doi:10.1016/j.apnr.2005.09.006

1990; Rotundi et al., 2002; Stovsky, Rudy, & Dragonette, 1988). Patients' inability to communicate results in unrecognized pain, feelings of loss of control, depersonalization, anxiety, fear, distress, and frustration (Criner & Isaac, 1995; Dickerson, Stone, Panchura, & Usiak, 2002; Gries & Fernsler, 1988; Hafsteindottir, 1996; Heath, 1989; Johnson & Sexton, 1990; Riggio, Singer, Hartman, & Sneider, 1982; Stein-Parbury & McKinley, 2000). Patients may become anxious when their needs are not met during periods of mechanical ventilation because of their inability to verbally communicate with family and health care providers (Levine, Koester, & Ket, 1987). A cycle of confusion ensues, involving misunderstandings between nurses and patients during attempts to convey messages that are misinterpreted or misunderstood (Carroll, 2004). Anxiety and frustration build and contribute to the negative emotions and feelings of dependency, dehumanization, and futility (Carroll, 2004). Patients have described their inability to communicate during mechanical ventilation as "frustrating," "scary," and "horrible" (Fowler, 1997; Happ, Tuite, Dobbin, DiVigilio-Thomas, & Kitutu, 2004). Interventions that health care practitioners can use include interpreting a patient's nonverbal forms of communication such as mouthing, gesticulating, nodding, and writing. Such nonverbal methods not only require energy but are tiring and emotionally draining for these patients. The use of a board as an intervention to enhance communication has been proposed by health care practitioners (Adomat & Killingworth, 1994; Belitz, 1983; Happ, 2001; Martensson & Fridlund, 2002; Williams, 1992). Appel-Hardin (1984) described the components of a communication board, wherein patients can easily point to letters, words, or pictures. Williams (1992) presented an algorithm for selecting a communication technique, including various types of boards, for use with patients during mechanical ventilation. However, little systematic research has addressed whether communication boards have the potential to improve communication in intubated patients. Furthermore, the optimal content for communication boards in intensive care units (ICUs) is not known. Thus, further research is necessary to examine patients' perceptions of the utility of a communication board and to identify the content and format patients want in a communication board.

## 2. Purposes

The purposes of this study were as follows:

1. To identify patients' perceived level of frustration when attempting to communicate during mechanical ventilation;
2. To determine patients' perceived level of frustration if a communication board had been used; and
3. To describe patients' perceptions of the appropriate content and format of a communication board for patients receiving mechanical ventilation.

This study will extend the body of literature on communication techniques used by patients receiving mechanical ventilation so that bedside nurses may develop interventions that prevent or mitigate the frustration and anxiety associated with communication when patients are awake and alert but cannot speak.

## 3. Review of the literature

Published case studies and other clinical literature have predominantly described the need to use communication boards and other assistive communication devices for patients receiving mechanical ventilation. These devices range from simple pencils and papers, to alphabet/word/picture boards, to computer keyboards (Adomat & Killingworth, 1994; Belitz, 1983; Happ, 2001; Williams, 1992). Although many authors suggest a picture board for use with patients during mechanical ventilation, they rarely describe what the board consists of, what patients mostly ask for on the board, and whether the board is successful in helping patients (Adomat & Killingworth, 1994; Belitz, 1983; Happ, 2001; Martensson & Fridlund, 2002; Stovsky et al., 1988; Williams, 1992).

Two research studies and several clinical articles about using communication boards in patients who are mechanically ventilated have been published in the past 30 years. The earliest journal article on communication boards was published in 1975. Lawless (1975) described different types of boards that could be used to help patients communicate during mechanical ventilation: a magic slate board, magnetic plastic letters and board, an alphabet board, a picture board, and a simple writing board. The specific content and format of these boards were not described, nor were any of these boards tested to assess their effectiveness in facilitating communication.

Appel-Hardin (1984) was the first author to illustrate a sample communication board in the literature. The author suggested that the content of the board include alphabet letters, words describing basic needs (i.e., pain and thirst), pictures of body parts, and names of people (i.e., spouse, family member, and doctor). Publishing a sample communication board provided clinicians with the content and format of a board from the nurses' perspective. However, this published board was not tested for its ability to meet patients' communication needs.

Two published research studies investigated the effectiveness of a communication board in facilitating communication with patients during mechanical ventilation (Fried-Oaken, Howard, & Stewart, 1991; Stovsky et al., 1988). Other research studies that used different communication methods (e.g., electronic voice output) were found but were not included in this focused review of the literature on the use of communication boards in patients receiving mechanical ventilation (Costello, 2000).

Stovsky et al. (1988) used a quasi-experimental design to compare two methods of communication in 40 patients receiving ventilator support after cardiac surgery (age: $M$ = 60 years; 5% female patients; intubation period: $M$ = 18–21 hours). The experimental group ($n$ = 20) was introduced to a communication board before surgery and they used the board during the postoperative period while receiving mechanical ventilation. The communication board used icons and pictures to represent basic needs (pain, fear, heat/cold, thirst, and bedpan). In contrast, the control group ($n$ = 20) relied on standard care and on the experience of nurses. Patients in the experimental group were significantly more satisfied with communication using the board than were patients in the control group. The level of significance was $P$ = .05. A surprising finding was that the nurses who worked with the board did not express increased satisfaction in communicating with patients (Stovsky et al., 1988).

Fried-Oaken et al. (1991) explored patients' experiences and preferences for augmentative and alternative communication (AAC) methods during mechanical ventilation in an acute care medical ICU. Five adults in the ICU with temporary severe expressive communication disabilities due to Guillain–Barré syndrome or botulism were interviewed. The patients were 17–68 years old ($M$ = 45 years) and had been receiving ventilator support for 2 weeks to 3 months. Patients were offered five to nine AAC methods during mechanical ventilation, including yes/no questions, mouthing words/lip reading, facial expression reading, and use of an alphabet board, a magic slate board, a phrase board, and electronic scanning devices. Details of the content of the various communication boards were not described in the study. Interviews of patients about their experiences in the use of AAC methods during mechanical ventilation revealed that four of five patients preferred the alphabet board and the magic slate board. Patients least preferred electronic scanning devices, expressing that the alphabet and magic slate boards were simple to use and easy to learn and apply. In addition, patients recommended the in-service training of all ICU staff with AAC techniques and "continual patience" when using these devices. Training of family members and acceptance of communication alternatives were also identified as crucial to success in communicating.

In summary, few descriptive or empirical studies have tested the effectiveness of a communication board or have explored the content and format of a board from the patients' perspective. Two studies indicated that the use of a communication board was helpful and satisfactory in facilitating communication during mechanical ventilation (Fried-Oaken et al., 1991; Stovsky et al., 1988). However, the generalizability of findings to all patients receiving mechanical ventilation is limited because these studies were performed in a homogeneous group of patients receiving mechanical ventilation (i.e., after cardiac surgery) or in a small sample of patients ($n$ = 5) with Guillain–Barré syndrome or botulism disorder. In addition, the type of communication board used in these two studies differed, and further testing on the reliability of the board is needed. Previous research studies did not describe the level of frustration when using the communication board; only level of satisfaction was studied. Finally, patients' preferences regarding the content and format of these boards were not studied. Thus, further research in these areas is needed.

## 4. Method

### 4.1. Design

An exploratory descriptive design involving both qualitative and quantitative analyses was used. Data reported here are part of a larger descriptive study of the communication needs of 29 critically ill patients receiving ventilator support (Patak, Gawlinski, Fung, Doering, & Berg, 2004). The principal investigator spent 20–60 minutes interviewing each patient using a questionnaire consisting of 13 questions. Those questions had been developed based on researchers' 25 years of collective clinical experience with patients receiving mechanical ventilation. A panel of six experts, including ICU clinical nurse specialists and nurse researchers, had reviewed the questions for content validity. The principal investigator asked patients four questions (Questions 10, 11, 12, and 13) to uncover: (1) how frustrated patients had been when trying to communicate during mechanical ventilation; (2) how frustrated patients think they would have been if they had been able to use a communication board (Vidatak EZ Board); (3) how helpful patients thought a communication board (Vidatak EZ Board) would have been; and (4) what information patients thought should be provided on a communication board (Vidatak EZ Board) and how it should be designed. Responses to these four questions are reported here; responses to the other interview questions were reported by Patak et al. (2004).

### 4.2. Sample and setting

After the study had been approved by the institutional review board, a convenience sample of patients from the ICUs of an urban university medical center who met the inclusion criteria were recruited. To be included in the study, patients had to: (1) be between 18 and 85 years old; (2) speak English; (3) be oriented to person, place, time, and situation at time of the interview; (4) be competent and able to sign an informed consent form; and (5) have required intubation and mechanical ventilation for at least 18 hours and have been extubated within the preceding 72 hours.

The age range was chosen to evaluate the communication needs of adults (18–85 years old) and to avoid approaching patients who would likely be unable to complete the extensive interview or unable to meet inclusion criteria. The abovementioned time frame was chosen to provide a sufficient amount of time required to experience impaired verbal communication while awake and intubated, and to

maximize patients' recall of their experience of being mechanically ventilated after extubation (Fowler, 1997; Menzel, 1997). Any subject who did not speak English, had a tracheostomy, or was hemodynamically unstable at the time of the interview was excluded from the study.

### 4.3. Procedure

The first step in recruiting participants for the study was for the principal investigator to review patients' files to check factors such as duration of intubation and time of extubation to determine whether the patients met inclusion criteria. Next, the investigator discussed potential subjects' physical and psychological status with the nursing staff to see if the patients had any limitations with respect to cognition or emotional state. After extubation, written informed consent was obtained from the patients.

To prepare for the interviews, the principal investigator (an experienced and certified critical care registered nurse) audiotaped several role-playing interview sessions and had an experienced researcher critique the practice interviews.

Demographic data were obtained from the patients' medical records and by querying patients. Interviews were performed in the unit in either a private critical care room or an intermediate care room with a curtain drawn or with the door closed to ensure privacy and to minimize extraneous noises and distractions. Each interview lasted from 20 to 60 minutes. The questions were asked in the same order in all interviews. All responses were audiotaped and transcribed verbatim (Patak et al., 2004).

### 4.4. Instrumentation

#### 4.4.1. Survey

The 13 questions on the survey focused on three major areas of interest: (1) assessing patients' level of frustration with communication and their perception of communicating interventions used by health care practitioners; (2) identifying patients' perceived communication needs and what they perceived as barriers and facilitators to effective communication; and (3) retrospectively evaluating the perceived helpfulness, use, and content of a communication board (Vidatak EZ Board). Ten interview questions were open-ended to permit in-depth qualitative analysis, and three questions used a 5-point Likert scale (1 = *least*; 5 = *most*) for quantitative analysis. Open-ended questions asked patients to describe their experience in trying to communicate while receiving ventilator support, including describing their needs, listing what they saw as facilitators and barriers, and evaluating a communication board.

Questions 10, 11, and 13 used a Likert scale to determine: (1) the level of frustration the patients experienced in communicating while receiving ventilatory support; (2) how helpful patients thought a communication board would have been if it had been available; and (3) how frustrated patients thought they would have been if a communication board had been available. Patients' retrospective assessments of how frustrating trying to communicate would have been if a communication board had been available covered a wide range, from *not frustrating* to *extremely frustrating*. Patients' assessments of how helpful a communication board would have been spanned a similar range, from *not helpful* to *extremely helpful*. Question 12 asked patients to look at the communication board (Vidatak EZ Board) and to identify what "would have worked" for them and what would not have worked for them in using this board for their communication needs. Responses to these questions are reported next, including patients' evaluation of the communication board. Because of the extensive amount of data obtained from the interviews, responses to the other survey questions are reported elsewhere (Patak et al., 2004).

#### 4.4.2. Communication board

A communication board called the Vidatak EZ Board, which was patented in the United States in 1999, was used in this study (Appendix A). The communication board was developed by the principal investigator in consultation with a panel of four clinical experts who were advanced practice nurses working with patients receiving mechanical ventilation at an urban university medical center. Panel members reviewed the content of the communication board and agreed that the content was valid and appropriate for this study. The Vidatak EZ Board differed from other published communication boards that used only letters of the alphabet, single words, and pictures.

The communication board was an 8.5×14-in. dry-erase board made with eraser-board material as its surface on the front and back. On the front of the board, on the left side, is a 2.5×6-in.-tall rectangle containing the letters of the alphabet and the numbers 0–9. To the right of that is a half-inch square strip of Velcro to which the dry-erase marker is attached. To its right are two folders with the headings "I Am" and "I Want," with descriptive words listed accordingly under each. On the far right is a stop sign and topics of communication that stem from the "I Want" folder. Under the two folders are conversational phrases and questions. On the left half of the back of the board are two drawings: one anterior view and one posterior view of an androgynous human body within a box entitled "Pain Chart." To the right of the pain chart are imprinted descriptive expressions of physical experiences relating to parts of the human body. In addition, to the right of those words is a vertical pain scale from 0 to 10. On the far right is a 3×6-in. box entitled "Memo," which was designated as a patient's personal writing space (Appendix A).

## 5. Analysis

The interviews were all tape-recorded and then transcribed verbatim. Two researchers independently examined each transcription and analyzed each one for statements related to receiving mechanical ventilation. Then the two researchers shared their extracted statements and agreed upon a meaning,

or theme, for each of the statements. Each transcript was then transferred verbatim, according to its assigned theme, into a qualitative research computer program (Nudist). Qualitative data were analyzed with expert content analysis. An expert critical care nurse who was experienced with patients receiving mechanical ventilation also reviewed the data to confirm the themes (Patak et al., 2004).

Descriptive and frequency analyses were performed on all demographic data. The demographic and clinical characteristics of the sample were organized and presented using measures of central tendency (Statistical Package for the Social Sciences 10.0). Descriptive statistics were used to determine the level of frustration patients receiving ventilation reported as they imagined their experiences with and without the communication board. A Wilcoxon signed ranks test was used to compare frustration scores (1 = *not frustrated*; 5 = *extremely frustrated*) with and without the communication board.

## 6. Results

### 6.1. Description of subjects

Thirty-two patients met the criteria for inclusion in the study. Two patients were excluded because they were too tired to complete the interview. Another subject was excluded because of a technical problem with recording that prevented a verbatim transcript from being generated.

Table 1
Demographic characteristics of the sample ($N$ = 29)

| Variable | No. | % |
|---|---|---|
| Sex | | |
| Male | 19 | 65.5 |
| Female | 10 | 34.5 |
| Diagnosis | | |
| Cardiomyopathy | 5 | 17.2 |
| Coronary artery disease | 4 | 13.7 |
| Congenital abnormality | 1 | 3.4 |
| Valvular disorder | 8 | 27.6 |
| Aneurysm | 1 | 3.4 |
| Organ transplantation | 3 | 10.3 |
| Surgical resection | 3 | 10.3 |
| Pulmonary disease | 2 | 6.9 |
| Trauma | 1 | 3.4 |
| Renal disease | 1 | 3.3 |
| Ethnicity | | |
| White | 25 | 86.2 |
| African American | 1 | 3.4 |
| Hispanic | 2 | 6.9 |
| Asian or Pacific Islander | 1 | 3.4 |
| Education | | |
| High school diploma | 9 | 31.0 |
| Undergraduate degree | 7 | 24.1 |
| Associate degree | 6 | 20.7 |
| Graduate degree | 1 | 3.4 |
| Doctorate | 4 | 13.3 |
| Unknown | 2 | 6.9 |

*Notes*. Total percentages are < 100 due to rounding.
Source: Reprinted from Patak et al. (2004), with permission.

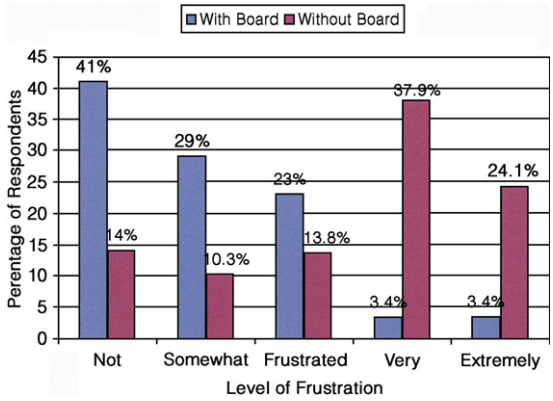



Fig. 1. Recalled level of frustration in communicating needs with and without a communication board. $P$ <.001.

Data for the remaining 29 subjects were analyzed. Most patients were male (65.5%; $n$ = 19). The mean age of the subjects was 55.5 years ($SD$ = 17.3 years). The most common primary diagnosis among the participants was valvular disorders (27.6%; $n$ = 8). Other demographic variables are listed in Table 1.

The clinical characteristics of the sample included a mean duration of mechanical ventilation of 3.40 days (range = 0.85–19.12 days). Most subjects (86%; $n$ = 25) had received ventilator support after receiving elective surgery. Four (14%) subjects required emergent intubation and ventilation due to respiratory failure. Twenty-three (79%) subjects received anxiolytic medications while receiving mechanical ventilation. The most common anxiolytic used was Versed (37.9%; $n$ = 11).

### 6.2. Patients' level of frustration

Eighteen (62%) patients reported high levels of frustration associated with their inability to communicate effectively while receiving mechanical ventilation; 7 (24.1%) described it as extremely frustrating and 11 (37.9%) described it as very frustrating. Seven (24%) patients reported their experience as either frustrating (13.8%; $n$ = 4) or somewhat frustrating (10.3%; $n$ = 3). Only four (14%) patients reported that their experiences in communicating during mechanical ventilation were not frustrating (Fig. 1).

### 6.3. Patients' perceived level of frustration if a communication board had been available

When patients were asked to rate how frustrated they would have been if a communication board (Vidatak EZ Board) had been used, their estimated frustration levels were significantly ($P$ < .001) lower (29.8%) than the levels of frustration they reported for trying to communicate without a communication board (75.8%; Fig. 1). Forty-one percent ($n$ = 12) of patients reported that they would not have been frustrated if the communication board had been used during mechanical ventilation, whereas 6% ($n$ = 2) reported that their level of frustration would have remained high (very frustrating, 3.4% [$n$ = 1]; extremely frustrating,

3.4% [$n$ = 1]). Overall, 25 (86%) subjects reported that having a communication board while receiving mechanical ventilation would have lessened their frustration level. Only four (14%) subjects reported that their frustration level would not have changed if a communication board had been available during mechanical ventilation.

### 6.4. Patients' perceptions of the helpfulness of a communication board

Sixty-nine percent of subjects ($n$ = 20) reported that a communication board would have been extremely helpful (41.4%; $n$ = 12) or very helpful (27.6%; $n$ = 8) in communicating effectively during mechanical ventilation. Eight (27.5%) subjects believed that using a communication board during mechanical ventilation would have been helpful (17.2%; $n$ = 5) or somewhat helpful (10.3%; $n$ = 3). One (3.4%) subject thought that the use of a communication board during mechanical ventilation would not have been helpful.

### 6.5. Patients' reports on the content of the Vidatak EZ Board

Subjects were asked to evaluate the content of the Vidatak EZ Board in terms of what would have worked and what would not have worked for communicating during mechanical ventilation. Subjects provided both positive and negative comments related to the board. In addition, subjects provided creative and practical suggestions for the future development of a communication board. The following themes emerged from the data:

1. A preprinted communication board is more efficient and faster than writing.
2. A preprinted communication board facilitates patients' communication of their emotional needs and conveyance of their individuality.
3. A preprinted communication board meets the visual and literal needs of patients.

#### 6.5.1. A preprinted communication board is more efficient and faster than writing

Positive comments included using the board to increase the efficiency and speed of communication with preprinted text. One patient stated:

> ". . . extremely helpful, because it speeds up the process of communication. This is very efficient."

> "You don't have to take the time to write it down."

Other patients' comments reflected the thoroughness of the board:

> "This has most of the questions I wanted to ask."

> "I think you have most of the keywords that people would want attended to on this."

> "It would allow me to indicate things without having to draw them. The idea of pointing at a figure and then completing the sentence with catch phrases is a good idea."

A patient summarized:

> "It says everything."

#### 6.5.2. A preprinted communication board facilitates patients' communication of their emotional needs and conveyance of their individuality

Patients also described using the board to facilitate practitioners' fulfillment of their emotional needs, as well as recognition of their individuality. One patient described the benefits of the board as follows:

> It would create an interface between the patient and the staff that would, in a way, formalize the requirement that they pay attention to what the patient is trying to say. It would be like a passport. The person, even if he didn't use it, could wave it, say, "I matter. I can be heard. I have a stake in this. It's not just about you acting on me. It's about my being able to tell you what I want, what I'm doing." I believe the concept itself is very strong because it would obligate the staff to both stop and listen with a fresh ear, instead of saying, "Oh well, they're intubed. They can't talk. Let's just write them off." It could inspire, that is to say, instill hope and empower those who are not as strong-willed as I am.

Other patients expressed their perceptions by stating:

> "This is really good because it addresses the emotion and the needs . . . and like I said, when you're intubated, emotion is the most important thing I think . . . and to explain what's going on."

> "It helps organize what you're trying to communicate and it helps them better understand what you are trying to communicate."

> "That helps cut to the chase . . . because these are stuff that you would like to have attended to right away if you have some problem."

#### 6.5.3. A preprinted communication board meets the visual and literal needs of patients

Subjects also provided negative comments related to the board—its content, layout, and material. The board was described as being too overwhelming, especially for "being critically ill." One patient stated:

> "I'm not sure that this isn't overkill. Conciseness. How would you know the difference between anxious and afraid with varying degrees of the same emotion?"

Another patient described difficulty with the board as follows:

> "I wouldn't be able to write. But, I could be able to, you know, put a . . . just do a dot or a line."

Other patients commented on the amount of information contained on the board:

> "I think there's just too much to absorb on this side."

> "There's a lot of information on this side of the board that's just not relevant."

Patients suggested a more concise layout of the preprinted text, changes in colors, and minimizing glare for visual enhancement. One patient stated:

> "I mean, just with my glasses, in this dim lighting, you're getting a reflection here that's hard to . . . you can't read."

Another patient described difficulty in reading the board:

> "It would have been easier if that glare wasn't there. I had to adjust [to] it."

Other patients had problems with the colors of the letters:

> "I couldn't see that because it's in red."

> "Some of the colors of the lettering, I'm not able to see it."

Early exposure to the communication board during a preoperative teaching session was also suggested. One patient's recommendation was as follows:

> Maybe it could be part of the preoperative package. It's a lot of information, but if they had a photocopy on paper of this and said, "this is your message board, familiarize yourself with it," that could be very helpful, so that somebody isn't trying to cope with discomfort and trying to interpolate.

To meet respondents' communication needs, additional suggestions were given, including securing the pen with a snap-in device, having more memo space, making the alphabet with big block letters, making the letters bigger, separating acute care needs from routine needs, including preprinted text stating the matter of urgency for a request (such as *now*, *immediately*, *as a soon as possible*, and *later*). A few subjects requested that words be removed from the board (such as *happy*, *sad*, *good*, *bad*, *hairbrush*, *water*, and *phone*). Others requested that words be added (such as *fear*, *gagging*, *choking*, and *I can't breathe*).

## 7. Discussion

Our findings indicate that some patients receiving mechanical ventilation experience a high level of frustration in communicating their needs and that the use of a communication board might reduce frustration. The majority of subjects thought that a communication board would have significantly decreased the level of frustration they had experienced during mechanical ventilation. Subjects identified a communication board as a tool to increase the speed and efficiency of communicating what they think, need, and feel. To some patients, the board symbolized having the power and control to communicate that what they had to say mattered.

Findings from this study also provided direction for the content, format, and materials that are useful for developing communication boards. For example, enlarging letters and pictures, separating acute needs from routine needs, and including text to reflect levels of urgency were identified as helpful. Constructing the board with lightweight materials was important so that frail, weak, and fatigued patients could hold the board. This information will be used to revise the Vidatak board.

Further research is needed to link the use of the communication board to outcome variables such as pain management, duration of mechanical ventilation, and patients' level of anxiety and frustration. Additional evaluation is needed to understand how to introduce the communication board, perhaps at a preoperative teaching session. Helping patients anticipate alternate forms of communication may decrease anxiety and frustration, as patients do not always foresee that they will be unable to communicate. Giving the board, or a photograph of it, to patients before surgery may enable them to familiarize themselves with the content of the board and assures patients that a form of communication will be available.

This study differs from previously published studies that explored patients' recollection of experiences during mechanical ventilation. The patients interviewed in this study were asked to quantify their level of frustration and to describe the utility of a communication board. To date, no studies have described patients' perceptions of what would be helpful in designing a communication board.

## 8. Conclusion

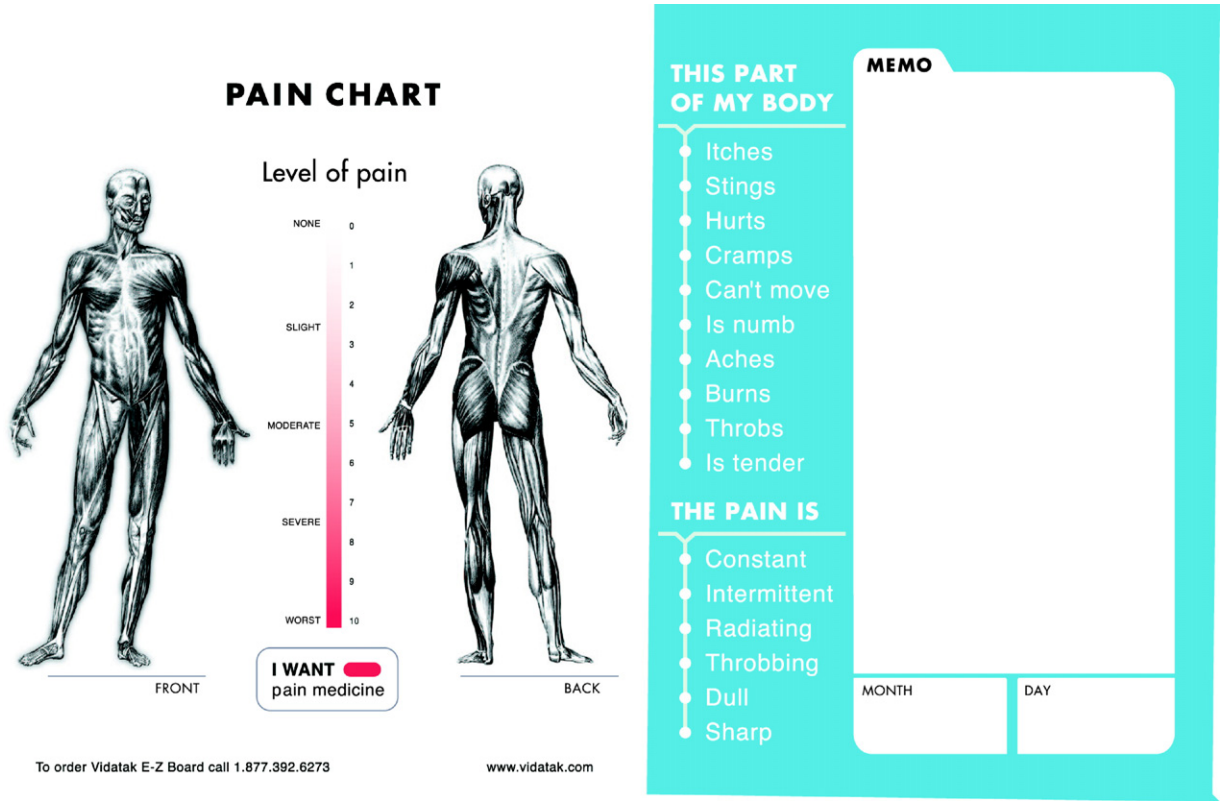
Our results allow health care practitioners to see the communication needs of patients receiving ventilator support through the eyes of the patients themselves after recovery from intubation and mechanical ventilation. This information offers insights into levels of frustration that patients experience when attempting to communicate during mechanical ventilation. A communication board may be effective in decreasing frustration and in facilitating communication. Patients also described several advantages of a communication board with preprinted text: (1) it increases the efficiency and speed of communication; (2) it facilitates meeting of needs; and (3) it acts as a vehicle to obtain recognition of patients' individuality.

Further research is needed to evaluate the use of preprinted communication boards and other methods of facilitating communication with respect to increasing patients' satisfaction, reducing patients' anxiety, and achieving adequate and appropriate pain management. It may also be useful to study the experiences of families and nurses in using the board. Other areas of investigation relating to the use of a preprinted communication board include examining its potential effect on shortening the duration of intubation and mechanical ventilation and on decreasing the length of hospital stay by promoting a more expedient weaning from mechanical ventilation.

## Acknowledgment

This project was funded by a research grant from Sigma Theta Tau, Gamma Tau Chapter.

## Appendix A.


PAIN CHART
Level of pain
NONE
SLIGHT
MODERATE
SEVERE
WORST
0
1
2
3
4
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6
7
8
9
10
FRONT
BACK
I WANT
pain medicine
To order Vidatak E-Z Board call 1.877.392.6273
www.vidatak.com
THIS PART OF MY BODY
Itches
Stings
Hurts
Cramps
Can't move
Is numb
Aches
Burns
Throbs
Is tender
THE PAIN IS
Constant
Intermittent
Radiating
Throbbing
Dull
Sharp
MEMO
MONTH
DAY


VIDATAK
PATIENT NAME
[Place label here]
A B C D
E F G H
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M N O P
Q R S T
U V W X
Y Z 0 1
2 3 4 5
6 7 8 9
FOR INDIVIDUAL USE ONLY
I AM
Short of breath
Gagging
Hot
Thirsty
Better
Wet
Tired
Nauseous
Frustrated
Light-headed
Disappointed
Unsure
(of what is happening)
Anxious
Cold
Hungry
Worse
Drowsy
Angry
Pain
Afraid
I WANT
To be suctioned
Make a call
Water
Ice
Lotion
To sit up
Bath
Blanket
Pillow
Socks
Exercise
To turn
left right
Massage
Call light,TV
Eyeglasses
Hairbrush
Family
To lie down
To sleep
Shampoo
Urinal
Bedpan
Lights
on off dim
CLEAN MY
Mouth
Teeth
Face
Nose
Hands
Hair
I WANT TO SEE
Doctor
Nurse
Respiratory Therapist
Assistant
YES stop
NO explain
Thank You
immediately later as soon as possible
where how when why what who

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