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Retention and use of cardiopulmonary resuscitation skills in parents of infants at risk for cardiopulmonary arrest.

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Policies of most neonatal intensive care units include teaching cardiopulmonary resuscitation (CPR) to parents or other caretakers prior to infant hospital discharge. However, little is known about CPR skills retention in this population or the outcome of parents' use of CPR. This is a study to measure CPR skills 6 months following CPR training to identify characteristics predicting successful performance and to determine if parents used CPR. A sample of 100 parents or related caretakers of infants at risk for an out-of-hospital, respiratory or cardiac arrest 6 months following CPR training were asked to demonstrate CPR on an infant mannequin and 94 agreed to participate. Although they were excluded from the study if they had a CPR course within the past 2 years, 37% had taken CPR sometime in the past. Only one third of participants (n = 31, 33%) were able to perform satisfactory CPR. Those who demonstrated satisfactory CPR skills were more likely to have had previous CPR training and to have experienced higher levels of social support at the time of training than those who achieved unsatisfactory CPR performance ratings (p [is less than] .05). A logistic regression analysis revealed previous CPR training, social support, and level of anxiety at time of CPR training to be the most important predictors of CPR skills retention. Seven parents reported using CPR to resuscitate their infant who had suffered a respiratory arrest. All seven were successful. CPR skills decay is significant for caregivers of infants at high risk for cardiopulmonary arrest. Parents should be encouraged to review the steps of CPR frequently and to attend refresher classes. A significant proportion of parents of infants hospitalized in the neonatal intensive care unit are called upon to use CPR and are able to use it appropriately.

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Cardiopulmonary resuscitation (CPR) coupled with the prompt delivery of advanced cardiac life support significantly improves the prognosis for infants and children suffering a cardiac or respiratory arrest outside the hospital (Hickey, Cohen, Strausbaugh, & Dietrich, 1995; Wolfer & Visintainer, 1975). This reality is particularly true of infants, who are most likely to suffer a respiratory arrest that responds quickly to resuscitation (Innes, Summers, Boyd, & Myolyneux, 1993). Findings from all studies to date indicate that the prompt delivery of CPR to an infant or child results in lower mortality and fewer neurological complications (Friesen, Duncan, Tweed, & Bristow, 1982; Innes et al., 1993). Therefore, it is important that parents and other caregivers of high-risk infants be able to perform CPR in case of an emergency in the home or other location outside the health care setting.

Most neonatal intensive care units (NICUs) and many pediatric intensive care units have policies that all parents be instructed in CPR prior to taking their infant home to ensure that they will know what steps to take in case of a sudden respiratory or cardiac arrest in the home (Conroy, Bond, & Tao, 1990; Donaher-Wagner & Braun, 1992). The importance of this recommendation is reflected in a study conducted in 20 pediatric cardiology centers (Higgins, Hardy, & Higashino, 1989). The researchers reported that over a 10-year period, 65 children had cardiac arrests at home. Of these children who arrested, 41 were from 12 centers that taught CPR to parents prior to discharge. Parents performed CPR in 24 cases (68%) and 13 (46%) infants survived. Twenty-eight of the infants who arrested were from 8 centers that did not routinely teach CPR. Cardiopulmonary resuscitation was not attempted in these cases, and there were no survivors.

Results from more than three decades of research have indicated that lay citizens can learn and perform CPR with a high degree of proficiency when tested immediately after training (Mancini & Kaye, 1990; Dracup, Heaney, Taylor, Guzy, & Breu, 1989; Van Kerschaver, Delooz, & Moens, 1989). Unfortunately, a serious deterioration in CPR psychomotor skills occurs when individuals are tested anywhere from a few weeks to 12 months after initial CPR training (Moser & Coleman, 1992). Knowledge about CPR, reflected in written tests, continues to remain high (Fossel, Kiskaddon, & Sternbach, 1983; Kaye et al., 1991; Moser, Dracup, Guzy, Taylor, & Breu, 1990; Weaver, Ramirez, Dorfman, & Raizner, 1979).

Almost all CPR retention studies have been conducted in populations of health professionals or lay people who have not had a family member at high risk for a cardiopulmonary arrest (Kaye et al., 1991) and little is known about the retention of parents whose infant is discharged from the NICU. Therefore, we conducted a study with the following aims: (a) to

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evaluate CPR skills retention at 6 months after initial CPR training in parents of infants considered at high risk for an at-home sudden respiratory or cardiac arrest; (b) to identify demographic and psychosocial factors contributing to good skills retention; and (c) to document parental use of CPR and outcomes.

Background

Many investigators have documented that retention of CPR skills is poor, and that it is unaffected by whether trainees are health professionals (e.g., nurse, physicians, paramedics) or lay public (Kaye et al., 1991; Moser & Coleman, 1992). Differences in curriculum and teaching strategies do not make a substantive difference (Kaye et al., 1991), although practicing at home following CPR training may improve retention. (Moser et al., 1990). Retention of knowledge about the information taught in a CPR class is quite good, and minimal decreases have been documented when participants have completed written tests prior to and following CPR training (Moser & Coleman, 1992). Thus, little relationship exists between CPR knowledge and skills.

It could be argued that CPR skills retention might be better in parents or caretakers of infants who required hospitalization in the NICU. Parents who anticipate a high probability of performing CPR to save their child compared to other lay persons who do not live with someone at high risk for a cardiopulmonary arrest might be expected to have better retention. However, in one study of family members of adult cardiac patients, CPR skills retention was extremely poor at 7 and 12 months following training (Moser et al., 1990). This finding could be explained by the age of the participants in the study (mean = 55 years), since age has been identified in several studies as inversely related to ability to learn and retain CPR skills (Brennan, 1991; Kaye et al., 1991; Moser et al., 1990).

Only five studies have been reported on the retention of infant CPR instruction by parents (Komelasky, 1990; Komelasky & Bond, 1993; LaMontagne & Pawlak, 1990; Long, 1992; Wright, Norton, & Kesten, 1989). In two of these (Komelasky, 1990; LaMontagne & Pawlak, 1990) the investigators tested retention of CPR knowledge, but did not assess skills. Wright and colleagues (1989) evaluated both CPR knowledge and skills over 2 months of follow-up in parents of 25 infants. CPR knowledge did not decrease, with an average retention score of 97.2%. Skills retention, however, deteriorated over the same time period with the mean CPR skills score decreasing by 15% at 2 months, a change identified as clinically significant by the investigators.

Two studies have been conducted to examine the effects of different teaching strategies on CPR knowledge and skills retention. When parents were tested 3 to 7 days following the class, Long (1992) found no difference in either knowledge or skills retention in 30 parents who attended a traditional lecture compared to an audiovisual tape. CPR retention was evaluated using a 10-question cognitive test and a 20-point checklist, both based on American Heart Association (AHA) criteria. Mean psychomotor skills averaged 70 and 75% for the two groups. Komelasky and Bond (1993) compared different reinforcement methods during clinic visits following hospital discharge of the infant. Sixty-nine parents were randomized to hands-on practice, a review of a CPR videotape, or control. Immediately following the in-hospital class they were rated using a 25-item skills list based on standard AHA criteria, with scores assigned for each item of 0 = not learned, 1 = needs reinforcement, and 2 = learned. The subjects achieved an average score of 48.8 out of a possible 50. At 10 weeks posttraining final scores varied between 14 and 50, with a mean of 44.7, but the most significant losses were seen in the control group.

In summary, researchers to date have documented that, similar to other populations, parents' knowledge about CPR remains relatively high up to 2 months following CPR training, but a significant reduction in CPR skills occurs over this same time period. Skills retention is slightly higher than that documented in lay groups and health professionals. Type of CPR instruction does not effect CPR skills retention, although opportunities for hands-on practice do appear to increase it. All of the studies to date have been limited by small sample size, short period of follow-up, and untested instruments for measurement of skills retention. Moreover, learning and retention are known to be mediated by several factors, including age, emotional state, previous exposure to the material, and personal motivation of the student (Friesen et al., 1982; Kaye et al., 1991; Moser et al., 1990; Redman, 1984; Van Kerschaver et al., 1989). None of these have been studied in relation to their effect on CPR skills retention in parents. An understanding of the parental characteristics that affect CPR skills retention would allow NICU nurses and other CPR instructors to target parents at-risk for poor retention. Nurses also would be able to modify instruction to address these mediating factors whenever possible. Finally, no follow-up of parental CPR instruction related to its use or the outcome of resuscitation efforts has been reported.

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Methods

The current study was conducted as part of a larger experimental trial designed to compare different methods of CPR training on psychologic adaptation of parents of high-risk neonates. Subjects were recruited from the NICUs of five hospitals in Southern California. Two of the hospitals were university-affiliated teaching hospitals and three were community hospitals. Approval to conduct the study was obtained from the appropriate institutional review boards and the medical and nursing NICU directors of the participating hospitals. All participants signed appropriate consent forms prior to entering the study.

Sample. Four hundred eighty-four parents or other caretakers were recruited for participation in the larger study. Of these, we asked a convenience sample of 100 participants to participate in a follow-up study of CPR retention. Complete data were obtained from 94 parents and other caretakers. Those participants who refused cited "being too busy with the new baby" as the reason.

To participate, parents or other caretakers had to live full-time with an infant who was considered at high risk for a cardiopulmonary arrest. Infants were classified as high-risk if they were born prematurely (less than 38 weeks) or with very low birth weight (less than 1500 grams), had a documented episode of apnea or bradycardia, had congenital heart, neurologic, or gastrointestinal disease, or had respiratory distress syndrome or bronchopulmonary dysplasia. Study participants were excluded if they were not literate in English or Spanish, if they had a CPR class within the last 2 years, or if their infant had complex technical needs (e.g., home ventilator).

Procedures. All parents attended a CPR class at the hospital during the time that their infant was hospitalized in the NICU. Classes were taught in either English or Spanish by advanced practice nurses with extensive CPR training experience. All instructors had extensive experience teaching CPR to parents of infants. Parents were free to choose either English or Spanish classes based on their degree of comfort with the language. As part of the larger study, we taught CPR using three different methods. Because there were no differences in retention between the groups, we combined the groups for subsequent analyses. To ensure consistency across CPR classes, the same videotape was used in all three groups. In the videotape, the steps of CPR were described and demonstrated, and participants were instructed to turn off the videotape and practice on a mannequin at four different points in the instruction. The same videotape was used for both English and Spanish classes, with the original English script dubbed in Spanish.

At the completion of the class all parents were required to demonstrate a minimum of four cycles of CPR with performance graded using the Mandel CPR Skills Checklist (Mandel & Cobb, 1982). After the performance rating was obtained, the instructor worked with each subject to correct any errors in CPR performance until the individual could demonstrate 100% proficiency. Ultimately all parents successfully demonstrated infant CPR.

Six months following CPR training, a masters-prepared nurse with extensive CPR training experience, but who had not been responsible for the original CPR training, called each subject and made an appointment to visit the home. Subjects were not told that testing would occur to preclude practicing for the test. They were told that the purpose of the visit was to collect follow-up data on their infant. Subjects were asked to demonstrate CPR for four full cycles.

Instruments. CPR performance, emotional state, and perceived social support were measured. Three instruments were used in this study.

CPR Skills Retention. The Mandel CPR Skills Checklist (Mandel & Cobb, 1982) was used to rate CPR performance. Using the checklist, the skill of CPR is divided into initial assessment, chest compressions, and ventilation (see Table 1). Based on an assessment of the performance in these three sections, an overall CPR performance rating is given. Based on that overall CPR performance rating, participants were given a score of either satisfactory or unsatisfactory. A satisfactory performance was one in which all steps were performed in the proper sequence and according to AHA standards. However, a performance that did not meet AHA standards was also rated successful if it was judged adequate and safe: the majority of compressions and ventilation were to standard; timing was off, hand position, mouth or nose seal slipped, but the subject corrected; or the call for help was left out or improperly timed, but all other sequencing was correct. An unsuccessful performance was one in which sequencing was incorrect; some maneuver was potentially injurious; inadequate compressions were delivered owing to poor depth of compression, problems with hand placement,

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problems with the compression/relaxation component, or poor timing; or ineffective ventilation were delivered due to uncorrected failure to open the airway, poor volumes, or poor timing.

Table 1. Categories and Individual Items Assessed by CPR Skills Checklist

Initial Assessment
Shake and shout
Call for help
Open airway
Look, listen, and feel
Initial ventilations
Check brachial pulse
Order of initial steps
Access emergency medical services prior to starting CPR
Chest Compressions
Check for landmarks
Correct hand position
Correct rescuer body position
Fingers in correct position
Correct compression depth and rate
Ventilation
Adequate volume
Open airway
Tight mouth and nose seal
Correct compression:ventilation ratio
Overall CPR

The checklist has been used in a number of retention studies and has content validity (Coleman, Dracup, & Moser, 1991; Mandel & Cobb, 1987; Moser et al., 1990). The skills are based on those identified by the American Heart Association as being important components of CPR. Reliability of the checklist was established in two ways. First, a printout from a recording resuscitation mannequin was compared to the instructor-rated checklist; agreement between instructor rating and printout was 88.2%. Second, the same CPR instructor graded all 94 subjects. At the initiation of the study, this instructor rated the performance of a pilot group of 10 parents with a second instructor. Inter-rater reliability was established at 98.5% (number of agreements divided by number of agreements plus number of disagreements).

Emotional State. Participants' emotional states were measured immediately prior to teaching CPR with the Multiple Affect Adjective Checklist (Zuckerman & Lubin, 1965; Zuckerman Lubin, Vogel, & Valerius, 1964; Zuckerman, Lubin, & Rinck, 1983; Zuckerman & Blase, 1962). The checklist consists of 132 alphabetically arranged adjectives. The participant is instructed to work rapidly and check the words that describe his or her feelings today. Anxiety, depression, and hostility are scored separately. Higher scores indicate higher levels of anxiety, depression, and hostility, with the range of scores being 0-21, 0-40, and 0-30 respectively. For anxiety, scores of 7 or less are within normal range; for depression scores of 11 and above are considered moderate clinical depression. The instrument has been used in numerous clinical populations and has acceptable reliability and validity (Zuckerman & Lubin, 1965). In the current study, reliability was assessed using Cronbach's alpha. Internal consistency was 0.80 for the anxiety subscale, 0.85 for the depression subscale, and 0.80 for the hostility subscale.

Perceived Social Support. Subjects' perception of their level of social support was also measured just prior to CPR instruction using the Perceived Social Support Scale (Blumenthal et al., 1987). Subjects respond to 12 statements using a 7 point Likert scale, with 1 = very strongly disagree and 7 = very strongly agree. Therefore, higher scores indicate higher levels of social support, with a possible range of 12 to 84, illustrative items are, "I can talk about my problems with my family," and "There's a special person in my life who cares about my feelings." Internal consistency of the scale has been reported as 0.88 using Cronbach's alpha. The stability of the instrument was 0.85 using test-retest at a 2-month interval. In the current study, internal consistency using Cronbach's alpha was 0.94.

Data analysis. Descriptive statistics were used to characterize the entire sample. Chi-square and independent t tests were used to compare the baseline characteristics between the two groups (successful and unsuccessful). Additionally, we used multiple logistic regression to determine which factors were most important in discriminating between those parents

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who remembered CPR skills at 6 months and successfully demonstrated these skills compared to parents who had poor retention. Statistical significance was set at p [is less than] 0.05 for all analyses.

Results

Sample characteristics. The majority of study participants were female ($n = 60$ or 64%) and most were the infant's mother ($n = 51$ or 54%) or father ($n = 34$ or 36%), with 78% of subjects married. On average, participants were 32.1 ([+ or -] 10.3) years old (range 16 to 65 years) with 13.3 ([+ or -] 2.9) years of formal education (range 4 to 21 years). The majority ($n = 59$ or 63%) had never taken a CPR Class. Ethnicity reflected the Los Angeles population, with 40% ($n = 38$) Caucasian, 35% ($n = 33$) Latino/a, 11% ($n = 10$) Asian, 9% ($n = 8$) African-American, and the remaining 5% ($n = 5$) of other ethnic backgrounds. In those who reported annual family income, socio-economic status was distributed across all social classes, with 17% ($n = 16$) reporting an income of less than \$20,000, 47% ($n = 44$) between \$20,000 and \$40,000, and 20% ($n = 19$) of greater than \$40,000.

CPR skills retention. Of the 94 participants, one third ($n = 31$, 33%) were able to perform satisfactory CPR. Subjects in the satisfactory group were compared with those whose performance was judged unsatisfactory on a variety of sociodemographic characteristics, as well as on their psychologic state at the time of CPR training (see Table 2). Only perceived social support and previous CPR training were significantly different between the two groups. Family members who experienced higher levels of social support and who had attended a CPR class sometime in the past were more likely to achieve satisfactory scores than family members who felt lower levels of social support or who were not previously CPR certified. Although there was a trend for higher anxiety at the time of CPR training in the group with better skills retention, this difference was not statistically significant ($p = .06$).

Table 2. Comparison of Parents by CPR Skills Rating (N=94)

	Successful (n = 31) mean [+ or -] SD	Unsuccessful (n = 63) mean [+ or -] SD
Age (years)	31.6 [+ or -] 6.3	32.4 [+ or -] 11.9
Education (years)	13.7 [+ or -] 3.1	13.1 [+ or -] 2.8
Anxiety score	10.5 [+ or -] 4.2	8.6 [+ or -] 4.6
Depression score	16.5 [+ or -] 6.4	14.9 [+ or -] 7.2
Hostility score	10.5 [+ or -] 4.2	9.3 [+ or -] 4.4
Perceived Social Support	74.6 [+ or -] 8.5	68.6 [+ or -] 14.5
	n (%)	n (%)
Relationship to baby		
Mother	19 (62)	32 (51)
Father	11 (32)	23 (36)
Other Relative	1 (3)	8 (13)
Gender		
Female	23 (68)	40 (67)
Male	11 (32)	20 (33)
Income		
<\$20,000	3 (10)	13 (27)
\$20,000-39,999	7 (24)	12 (25)
>\$39,999	19 (66)	24 (49)
Previous CPR course(*)		
Yes	18 (58)	17 (27)
No	13 (42)	46 (73)
	<i>p</i>	
Age (years)	.74	
Education (years)	.38	
Anxiety score	.06	
Depression score	.31	

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Hostility score	.23
Perceived Social Support	.01
Relationship to baby	.30
Mother	
Father	
Other Relative	
Gender	.92
Female	
Male	
Income	.20
<\$20,000	
\$20,000-39,999	
>\$39,999	
Previous CPR course(*)	.004
Yes	
No	

(*) Had a previous CPR course more than 2 years prior to the current CPR course. No subject had CPR course within the 2 years prior to the Current CPR course. All Columns do not add to 100% owing to missing data.

A logistic regression was conducted to determine the characteristics that best predicted good CPR retention using the following variables: education level, previous CPR training, anxiety level, and perceived social support level. Results are summarized in Table 3. Those parents or related caretakers who had previous CPR training, reported higher social support, or who were more anxious at the time of training were more likely to retain CPR skills and achieve a satisfactory score at 6 months follow-up. Inclusion of these variables in the model predicted 75% of the cases of successful CPR retention.

Table 3. Results of Logistic Regression Analysis of Predictors of Successful Performance of CPR at 6 Months Following Training

Variable	B	Significance	Odds Ratio
Anxiety	0.16	0.01	1.17
CPR(*)	1.67	0.001	5.42
Social support	0.055	0.027	1.06

(*) Indicates previous CPR training prior to enrollment in study, but longer than two years.

At 6 months, 7 of the 94 individuals tested reported having used CPR to resuscitate their infants. All seven infants had respiratory arrests and all seven resuscitations were successful. Prior to CPR testing at 6 months, all 94 participants were asked if they thought they could perform CPR successfully, if they would do it if required sometime in the future, and what reservations they may have had about performing CPR. Responses are summarized in Table 4.

Table 4. Responses to Questions about Future CPR Use (N=94)

	n	(%)
Do you think that you can do CPR successfully?		
Yes	54	57%
No	6	6%
Unsure	35	37%
Would you perform CPR in the future?		
Yes	73	78%
Yes, but only on a family member	13	14%
No	2	2%

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Unsure	6	6%
If you have reservations about performing CPR, what are they? (*)		
Afraid of legal problems	7	47%
Afraid of catching a disease	6	40%
Afraid of hurting the baby	3	20%
Afraid of not doing CPR correctly	4	27%

(*) Percentages based on the 15 people who responded to this question: Subjects could give more than one answer.

Discussion

Cardiopulmonary resuscitation skills retention in this group of highly motivated parents of high-risk infants significantly decreased 6 months following CPR training. Only one third of subjects were able to perform CPR judged as successful 6 months following CPR training. Nonetheless, retention rates were actually better than those reported for medical students (Fossel et al., 1983), physicians (Hazinski, 1992), or nurses (Hazinski, 1992) and were similar to those achieved by emergency medical technicians (Fabius, Grissom, & Fuentes, 1994). The percentage of subjects who retained CPR skills is similar to that of other lay groups of similar age (Sigsbee & Geden, 1990) and significantly better than spouses of cardiac patients. In the latter group, 87.5% of subjects were unable to perform successful CPR 7 months following CPR training using the Mandel CPR Skills Checklist used in the current study (Moser et al., 1990). The difference between the two groups, both of which have a higher probability of using CPR to save a loved one than the average lay person taking a CPR class, may be due to the difference in ages. In a study of CPR skills retention of cardiac spouses, subjects were a mean age of 53 years, while the participants of the current study were 31 years on average. Age has been documented as having an inverse relationship with CPR learning and retention (Berden et al., 1994; Dracup et al., 1989; Kaye et al., 1991). In the current study, CPR skills retention was not influenced by age, which is most likely a reflection of the small variation of age in this sample.

Successful retention of CPR skills was not predicted by the subjects' gender, years of education, income level, or relationship to the infant (e.g., mother vs. father). These findings are similar to other CPR retention studies (Kaye et al., 1991) and suggest that CPR instructors cannot identify those learners who will retain CPR skills by virtue of their sociodemographic characteristics.

Subjects who had been previously trained in CPR were five times more likely to demonstrate successful CPR at 6 months follow-up than subjects with no previous training. Again, this finding is consistent with that of previous investigators (Berden et al., 1994) and suggests that multiple exposure to opportunities to review the steps of CPR and to practice the techniques enhance CPR skills retention. This study was not designed to evaluate reinforcement techniques, but several investigators have demonstrated improved retention with increased opportunities to practice CPR skills following CPR training (Komelasky & Bond, 1993; Mandel & Cobb, 1987; Moser et al., 1990). In fact, practice of CPR skills has been consistently a better predictor of CPR skills retention than the different strategies used to teach CPR (Kaye et al., 1991; Long, 1992; Moser et al., 1990).

The majority of participants (57%) thought that they could successfully resuscitate their infant if called upon to do so and an even-higher percentage said they would be willing to try (78%), but only 33% were able to demonstrate adequate skills retention. These findings highlight the fact the family members often overestimate their ability to do CPR (Moser et al., 1990). Moreover, only 55% of family members reviewed and practiced CPR in the 6 months following CPR training, underscoring the difficulty in motivating family members to practice CPR.

The psychosocial status of subjects at the time of initial training did make a significant difference in CPR skills retention. Those subjects who experienced greater social support at the time of CPR training demonstrated better skills retention. Although the reason for this finding is unknown, it can be speculated that parents and caretakers who feel supported during this period of transition with a new infant coming home are able to attend to the information presented in the CPR class better than those who experience less support. For many parents the individual they identified as providing the source of social support also attended the CPR course, which allowed for sharing of information and concerns.

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The finding that higher levels of anxiety at the time of CPR training predicted better retention was surprising and somewhat counterintuitive. The majority of education research supports the belief that anxiety reduces a student's ability to learn and retain information (Redman, 1984). However, anxiety about the infant's welfare may serve to motivate parents and caretakers to attend carefully to CPR instruction. Parents consistently identify learning how to deal with an emergency involving their infant as their number one concern prior to the infant's discharge from the NICU (Drake, 1995). The CPR class may meet this need extremely well, particularly in highly anxious parents, and may account for improved retention in these individuals. Thus, parents who are more anxious about the safety of the infant may attend to the information presented in CPR training more carefully and may remember it more vividly than parents who do not experience such anxiety.

The finding that seven parents were required to begin resuscitation at home and that all seven were successful reinforces the importance of NICU policies that parents and other caretakers be taught CPR prior to discharging the infant from the hospital. Such a policy is designed to ensure that parents of infants at high risk for arrest will know what to do in the case of an emergency outside the health care setting. The goal of such training is to enhance the ability of parents both to detect a life-threatening event early and to provide effective and safe CPR until emergency medical services arrive. Ultimately, the ability to demonstrate successful CPR is most important in the real life setting of a cardiopulmonary arrest.

Implications for Nursing

Nurses working in neonatal and pediatric intensive care units have become the primary trainers for parents of infants and children at high risk for a sudden cardiopulmonary arrest in the home. Such parents are a unique population of trainees because they are far more likely to be called upon to use CPR than the average CPR lay trainee. It is important that nurse instructors recognize the difficulty that all trainees have in retaining the skills related to successful CPR performance. Classes should focus on teaching CPR skills that are most relevant to the trainee, and parents should be encouraged to review the steps of CPR frequently and to attend refresher classes.

Future research should focus on identifying optimal methods of teaching CPR to promote CPR skills retention. The role of anxiety in promoting CPR retention is intriguing and requires further exploration.

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