

Behavioral Treatment of CPR Anxiety: A Case Study

By: Debra Bendell, [Terri L Shelton](#), Henry Krous, and Marcella Shirley

Bendell, R.D., Shelton, T.L., Shirley, M., & Krous, H. (1984). Behavioral treatment of CPR anxiety: A case study. *Children's Health Care*, 13, 77-81.

Made available courtesy of Taylor & Francis <http://www.taylorandfrancisgroup.com/>

The original publication can be found at <http://www.informaworld.com/smpp/title~content=t775648097> or http://dx.doi.org/10.1207/s15326888chc1302_5

*****Reprinted with permission. No further reproduction is authorized without written permission from Taylor & Francis (Routledge). This version of the document is not the version of record. Figures and/or pictures may be missing from this format of the document.*****

Abstract:

A 23-year-old mother with a previously documented psychiatric history experienced extreme anxiety regarding the potential need to resuscitate her infant from recurrent life-threatening apnea. Before discharge on a home monitor, the mother was treated with systematic desensitization and response prevention techniques for cardiopulmonary resuscitation (CPR) anxiety. Following 4 days of therapy, the mother successfully completed the CPR training course. At 4-month follow-up, the mother reported that she was able to use CPR successfully and could respond to apnea alarms within 10 seconds. Implications of this technique for other health care concerns are discussed.

Article:

The infant with interrupted apnea of unknown etiology, often labeled interrupted infantile apnea (11A) or idiopathic apnea, presents a complicated medical and psychological problem for the health care team. The infant is typically found limp, pale and/or cyanotic, and not breathing. Initial attempts to revive the infant are often made by auditory or manual stimulation, followed by rushing the infant to a hospital emergency room where a description of the apneic event is obtained by an emergency room physician.

Infantile apnea has been linked to a multitude of causes including prematurity, infection, hypoglycemia, metabolic imbalance, drug toxicity, seizure disorder, gastroesophageal reflux, congenital anomalies, and upper airway obstruction. Because of this varied etiology, a comprehensive medical evaluation is necessary to search for treatable disorders. At the University of Oklahoma Health Sciences Center, the work-up typically includes a medical and family history, physical examination, blood gases, serum electrolytes, glucose, cultures, toxicological analysis, electroencephalogram (EEG), electrocardiogram, and radiographic examinations of the lower and upper respiratory tract. Since these tests are usually negative, an overnight sleep study is then performed. The sleep study includes a 12-hour continuous polygraphic recording of sleep state, nasal airflow, and chest wall movement. Simultaneous continuous esophageal pH monitoring and ventilatory response to carbon dioxide inhalation are performed to identify gastroesophageal reflux and aberrant chemoreceptor function, respectively.

Results of the infant's sleep study are compared with postconceptual age-matched norms for abnormalities of central, mixed, and obstructive apnea during active and quiet sleep (Guilleminault, Ariagno, Korobkin, Nagel, Baliun, Coons, & Owen, 1979). Furthermore, the data are interpreted with the knowledge of the infant's medications such as theophylline levels (Kelly & Shannon, 1981).

Parental anxiety regarding the possibility of the sudden death of their infant cannot be overestimated, especially in those families who have experienced the death of a previous infant and who equate infantile apnea with sudden infant death syndrome (SIDS). Approximately 2% of the infants with abnormal sleep studies evaluated

in our hospital have died subsequently (Orr, Krous, Toubas, McCaffree, Bendell, & Mattice, Note 1). Duffy and Bryan (1982) report similar findings of 18%. Moreover, evidence associating apnea with some SIDS has been accumulating over the last decade from SIDS studies focusing on the respiratory abnormalities of parents of SIDS victims and infants with apnea who are considered to be at high risk for SIDS (Guillemainault et al., 1979, Hoppenbrouwers, Hodgman, McGinty, Harper, & Serman, 1980, Shannon, Kelly, & O'Connell, 1977, Stemschneider, 1972). However, significant and occasionally conflicting differences have been found among these studies suggesting that different pathophysiological mechanisms may be contributing to the cause of the apnea.

As a result of the conflicting data, an unequivocal cause-and-effect relationship between infantile apnea and SIDS has yet to be proven. For the parents of an apneic infant, however, the scientific controversy only increases their anxiety. Furthermore, many parents are aware that prolonged periods of apnea can be associated with varying degrees of neurological damage and developmental delay (Kelly, Shannon, & O'Connell, 1978), and this knowledge often increases feelings of apprehension.

The use of a home apnea monitor to alert parents to prolonged apnea or bradycardia has been advocated by Steinschneider (1974) and others, but has received equivocal support from others (Bergman, Beckwith, & Ray, 1975) on the basis that the monitor represents another source of anxiety for the parents. In an attempt to clarify this controversy, the parents' feelings, perceptions, and reactions to the stresses and satisfactions of home monitoring have been evaluated in several studies. In one such investigation, Cain, Kelly, and Shannon (1980) reported that over 70% of the 133 parents interviewed experienced extreme anxiety. However, after the first month of monitoring, levels of anxiety diminished for 50% of the population. Similar findings were reported by Black, Hersher, and Steinschneider (1978) and McCaffree, Bendell, Shelton, and Mattice (1983), who found that the severity of the initial apneic episode, false alarms, fatigue, and worry about monitor malfunction contributed to the anxiety of the parents, but that this anxiety diminished over time. However, for a small percentage of parents, the level of anxiety does not decrease and may, in fact, escalate depending on other personality and environmental factors. If severe, these reactions not only may interfere with the parent's ability to learn and to utilize procedures and techniques necessary for the well-being of their child but also may have a negative impact on the resulting parent-child interaction.

The potentially negative impact of extreme parental anxiety has been documented frequently among critically ill infants and children. While anxiety as an initial reaction to a critically ill infant or child is expected (Drotar, Baskiewicz, Irwin, Kennell, & Klaus, 1975), inability to cope successfully with these feelings can lead to difficulties in parent-infant bonding (Klaus & Kennell, 1976), and overprotectiveness, over-control, excessive permissiveness, lack of control, or overindulgence (Magrab & Calcagno, 1978, Talbot & Howell, 1971), as well as adversely affecting the child's reactions to subsequent hospitalizations and medical procedures (Campbell, 1957, Chapman, Loeb, & Gibbons, 1956, Heller, 1967). An illustration of the implications of extreme parental anxiety in the case of an apneic infant is presented along with a description of an intervention technique that proved to be successful.

CASE SUMMARY

A three-and-one-half-month-old female infant was found unresponsive, apneic, cyanotic, stiff, and with "glassy appearing eyes" some 90 minutes after being fed and put down for a nap. No seizure activity was observed. An uncle resuscitated the infant en route to a community hospital where the infant had stable vital signs and was alert. Prior to the apneic episode, the baby had been taking an antibiotic and decongestant that had been prescribed for an upper respiratory infection.

The past medical history revealed that the infant was the product of a term gestation and had a birthweight of 26 kg and high Apgar scores. The infant's prenatal and postnatal developmental history was normal prior to the apneic episode. However, the mother did report smoking two packs of cigarettes per day and taking Tylenol 5 to 6 times per week for headaches. The family history suggested that the infant could be suffering from familial

recurrent apnea. Two siblings, the mother's first and third child, and a cousin, the child of the mother's twin sister, had died of SIDS.

The infant was transferred from the community hospital to Oklahoma Children's Memorial Hospital (OCMH) where a comprehensive medical evaluation was performed. Relevant laboratory, EEG, cranial computed tomography (CT) scan, and electrocardiogram studies were normal. An overnight sleep study revealed an abnormal number of obstructive apneas of greater than 6 seconds duration compared to age-matched controls (Guilleminault et al, 1979). Based on the results of this evaluation, a home apnea monitor (Healthdyne) was recommended.

Maternal Psychiatric History and Reactions to Monitoring

The mother's psychiatric history and subsequent reactions to the monitoring program potentially impaired the quality of care given to her infant. The mother had received outpatient psychiatric care on two occasions and had been hospitalized on one occasion for 23 days with presenting complaints of memory lapses, sleeping difficulties, and hallucinations.

When the baby was brought to OCMH for evaluation, the mother was noted to have lowered affect and appeared to be indifferent to the infant's apneic episode. However, upon initiation of the home monitoring program, the mother found herself experiencing extreme anxiety and fear regarding her ability to respond appropriately to potential apneic episodes. Her reactions were related, in part, to her fear of losing another child to SIDS. She reported undergoing two elective abortions prior to the conception of the patient because of this possibility. The mother was phobic to the point of refusing to practice CPR on a "Resusci-Annie" doll because the doll's face reminded her of her dead children's faces. Her anxiety was increased further since the total responsibility for response to night alarms was hers as her husband worked at night. To mitigate these fears to the point that the mother could be trained in CPR and respond to alarms within 10 seconds, the following response prevention program was implemented.

Response Prevention

In general, response prevention or flooding is a technique that has proved to be effective in eliminating avoidance responses by exposing an individual to an anxiety-arousing stimulus while preventing the occurrence of avoidance behavior (Emmelkamp & Wessels, 1975). Based upon animal research investigating the establishment and extinction of avoidance responding (Solomon, 1964, Solomon, Kamm, & Wynn, 1953), this technique has been generalized to a variety of human disorders such as phobias (Yule, Sacks, & Hersov, 1974) and anxiety neurosis (Girodo, 1974).

It is generally assumed that persistent avoidance responses are the result of the individual pairing a "noxious" stimulus with aversive consequences (i.e., classical conditioning). Once established, these avoidance responses may continue to exist long after the cessation of aversive consequences. In theory, response prevention is designed to eliminate avoidance behavior and the anxiety that elicits it through a basic extinction procedure. Anxiety is induced through exposure to (e.g., in vivo) or the imagination of the noxious stimulus, but the individual is prevented from escape or avoidance behavior so that neither the anxiety nor the avoidance behavior will be reinforced by relief. Thus, the arousal of anxiety without any subsequent avoidance behavior or "aversive consequences" disconfirms that expectancy of dire outcomes and thus extinguishes this conditioned response as well. This technique also incorporates the principles of counter conditioning in which incompatible reactions are conditioned so that one set of responses (e.g., anxiety) is replaced by another (e.g., relaxation).

METHODS

Procedure

Pretreatment assessment Prior to the implementation of the response prevention procedure, it was determined that (a) the mother's fear and anxiety were fairly circumscribed to the CPR training equipment and to the apnea monitor, (b) the mother would be able to imagine or engage with the feared stimulus without any adverse significant reactions, and (c) the mother would be able to learn to relax. Baseline data of the daily frequency of

CPR practice by the mother while alone were obtained in the hospital for 2 days prior to the start of the program. In addition, the client was asked to report her level of anxiety on a rating scale when attempting to practice CPR.

Relaxation training. After base-line data were obtained, the mother was trained in a form of passive relaxation in which deep-breathing exercises and mental imagery were incorporated (Bernstein & Borkovec, 1973, Meichenbaum, 1977). The mother received three 20-minute training sessions and was instructed to practice this technique daily.

Exposure in vivo. After receiving training in relaxation, the mother was exposed to the phobic situation. She was asked to practice CPR on the "Resusci-Annie" doll for 10 minutes 5 times daily. CPR training was conducted on the medical ward and was supervised by the nursing staff. Practice times were randomly chosen, with the majority of sessions occurring during the 11 p.m. to 7 a.m. shift as this time period was proven to be the most probable time the infant would experience apneic episodes. The timing and random selection of sessions (e.g., waking mother at 3:00 a.m., having mother step out of the restroom, calling mother in from the hallway or cafeteria) were chosen in order to increase stimulus generalization to the home environment.

On day 1, the nurse was present with the mother four of the five allotted practice times. During the rehearsal of CPR the mother was asked to focus on the doll's chest as viewing the face produced increased anxiety. On day 2, the same procedure was followed except that the nurse was present only three of the five practice times. On day 3, the nurse was present only two of the five practice times, and on day 4 the nurse was not present. On this day, the mother practiced alone for each of the five practice trials.

In order to maintain therapeutic progress and obtain follow-up data after the cessation of the program, the family was followed on an outpatient basis by their local community guidance center. In addition, the parents were in contact with trained medical personnel associated with the apnea team that were available 24 hours a day.

Posttreatment and follow-up assessment. The nursing personnel recorded the number of CPR practice trials completed as well as the mother's reaction to each of the practice sessions prior to discharge and at each outpatient visit and/or by phone for 4 months following discharge. In addition, the mother was asked to report verbally her level of anxiety during the CPR practice trials.

RESULTS

As a result of the response prevention program, the mother evidenced a progressive decrease in avoidance behavior as reflected by her ability to complete the five daily practice trials. Concurrent decreases in reported and observed anxiety were observed during CPR trials as well. While the severity of the apneic episodes experienced during the treatment phase did not necessitate resuscitation, vigorous manual and auditory stimulation was required during two episodes.

In the final 4-month follow-up phone calls and clinical interview, the mother reported that she had been able to practice CPR spontaneously without increased anxiety through the use of imagery and relaxation. These reports were corroborated by the observations of other family members. During the follow-up period, the mother reported the occurrence of three episodes of multiple apneas with accompanying bradycardia alarms. The mother responded to these incidents successfully with manual and auditory stimulation of the infant within 10 seconds of the alarm. At 12 months of age, monitor usage was discontinued following 2 months of alarm-free sleep patterns.

DISCUSSION

The results of the posttreatment and follow-up data indicate that the use of a response prevention technique successfully reduced CPR anxiety and avoidance behavior. It appears that massing the mother's practice of CPR and providing her with alternative coping skills (e.g., relaxation, appropriate approach behaviors) decreased her

fear/anxiety to the extent that she was able to respond to apnea alarms appropriately after discharge from the hospital. In addition, the reduction of anxiety may have enhanced the mother's automaticity of response to the apnea alarm. While not all parents of apneic infants will evidence such extreme reactions to CPR training, nor will most parents have such a significant psychiatric history, the success of the program with this mother suggests that a response prevention program can be a powerful adjunct to a home monitoring program when parental anxiety threatens to interfere with necessary caretaking responsibilities. Modifications of this technique may also prove useful in circumstances in which anxiety prevents the parent from discontinuing monitor use.

This technique has implications in cases other than infantile apnea where parental anxiety and avoidance behavior techniques interfere with implementation of health care procedures. Similar behavioral techniques have been used in desensitizing children to medical procedures or hospitalizations (e.g., Siegel, 1976, Shore & Goldston, 1978) or in cases in which avoidance behavior has created some health problem (e.g., hysterical dysphagia, Nicassio, Arnold, Prager, & Bryant, 1981). However, until recently little attention has been directed toward addressing similar concerns in parents. While anticipatory guidance and greater contact between medical staff and parents have increased (Magrab & Calcagno, 1978), these approaches may not be sufficient in cases of extreme anxiety.

As an example, modifications of this technique could be used with parents whose anxiety about increasing oral feedings in a gastrostomy tube-fed infant are interfering with the ultimate removal of the tube. Similar reactions might arise in parents of a child who experienced apnea following a choking incident. Relaxation training coupled with gradual reintroduction of solid foods could be beneficial in reducing anxiety. Response prevention, practice sessions, and fading of medical support could be implemented in cases in which parents have difficulty administering insulin injections to diabetic children. As another example, some parents have difficulty complying with recommended physical therapy exercises because of the negative reaction of the child. This inconsistent exercising severely limits the child's potential range of motion and motor development. Often the parent is merely admonished to be more consistent. This interventive strategy might prove more successful as it would provide the anxious parent with alternative coping techniques.

As parents increasingly are being asked to assume these "medically" related duties, this program has the potential not only to increase compliance with medical regimens and thereby improve the quality of care of the child, but also to serve to increase the parent's self-confidence in this area.

References

- Bergman, A., Beckwith, C., & Ray, C. (1975). The apnea monitor business. *Pediatrics*, *56*, 1-3.
- Bernstein, D.A., & Borkovec, T.C. (1973). *Progressive relaxation training: A manual for helping professions*. Champaign, IL: Research Press.
- Black, L., Hersher, L., & Stemschneider, A. (1978). Impact of the apnea monitor on family life. *Pediatrics*, *62*, 681-685.
- Cain, L.F., Kelly, D.H., & Shannon, D.C. (1980). Parents' perceptions of the psychological and social impact of home monitoring. *Pediatrics*, *70*, 69-73.
- Campbell, E.H. (1957). *Effects of mothers' anxiety on infants' behavior*. Unpublished doctoral dissertation, Yale University, New Haven.
- Chapman, A.H., Loeb, D.G., & Gibbons, M.J. (1956). Psychiatric aspects of hospitalizing children. *Archives of Pediatrics*, *73*, 77-88.
- Drotar, D., Baskiewicz, A., Irwin, N., Kennell, J., & Klaus, M. (1975). The adaptation of parents to the birth of an infant with a congenital malformation: A hypothetical model. *Pediatrics*, *56*, 710-721.
- Duffty, P., & Bryan, M.H. (1982). Home apnea monitoring in "near-miss" sudden infant death syndrome (SIDS) and in siblings of SIDS victims. *Pediatrics*, *70*, 69-73.
- Emmelkamp, P.M.G., & Wessels, H. (1975). Flooding in imagination versus flooding in vivo: A comparison with agoraphobics. *Behavior Research and Therapy*, *13*, 7-15.
- Girodo, M. (1974). Yoga meditation and flooding in the treatment of anxiety neurosis. *Journal of Behavior Therapy and Experimental Psychiatry*, *5*, 157- 160.

- Guilleminault, C., Ariagno, R.L., Korobkin, P., Nagel, L., Baldwin, R., Coons, S., & Owen, M. (1979). Mixed and obstructive sleep apnea and near miss for sudden infant death syndrome 2: Comparison of near miss and normal control infants by age. *Pediatrics*, *64*, 882-891.
- Heller, J.A. (1967). *The hospitalized child and his family*. Baltimore: The Johns Hopkins University Press.
- Hoppenbrouwers, T., Hodgman, J.E., McGinty, D., Harper, R.M., & Serman, M.B. (1980). Sudden infant death syndrome Sleep apnea and respiration in subsequent siblings. *Pediatrics*, *66*, 205- 214.
- Kelly, D.H., & Shannon, D.C. (1981) Treatment of apnea and excessive periodic breathing in the full-term infant. *Pediatrics*, *68*, 183-186.
- Kelly, D.H., Shannon, D.C., & O'Connell, K. (1978). Care of infants with near-miss sudden infant death syndrome. *Pediatrics*, *61*, 511-514.
- Klaus, M.H., & Kennell, J.K. (1976). *Maternal-infant bonding*. St Louis: C.V. Mosby.
- Magrab, P.R., & Calcagno, P.L. (1978). The psychological impact of chronic pediatric conditions. In P.R. Magrab (Ed.), *Psychological management of pediatric problems* (Vol. 1, pp 3-14). Baltimore University: Park Press.
- McCaffree, M.A., Bendell, R.D., Shelton, T.L., & Mattice, C. (1983). Longitudinal familial adjustment to infants with interrupted infantile apnea. *Pediatric Research*, *17*(4), Part 2, 100.
- Meichenbaum, D.B. (1977). *Cognitive-behavior modification*. New York: Plenum Press.
- Nicassio, P.M., Arnold, E.S., Prager, R.L., & Bryant, P.R. (1981). Behavioral treatment of hysterical dysphagia in a hospital setting. *General Hospital Psychiatry*, *3*, 213-217.
- Orr, B., Krous, H., Toubas, P., McCaffree, M.A., Bendell, D. & Mattice, C. (1982) *Evaluation of infants with apnea*. Unpublished manuscript.
- Shannon, D.C., Kelly, D.H., & O'Connell, K. (1977). Abnormal regulation of ventilation in infants at risk for sudden infant death syndrome. *New England Journal of Medicine*, *297*, 797-750.
- Shore M.F., & Goldston, S.E. (1978). Mental health aspects of pediatric care. In P.R. Magrab (Ed.), *Psychological management of pediatric problems* (Vol. 1, pp 15-31). Baltimore: University Park Press.
- Siegel, L.J. (1976). Preparation of children for hospitalization: A selected review of the research. *Journal of Pediatric Psychology*, *1*(4), 26-30.
- Solomon, R.L. (1964). Punishment. *American Psychologist*, *19*, 239-253.
- Solomon, R.L., Kamin, L.J., & Wynn, L.C. (1953). Traumatic avoidance learning: The outcomes of several extinction procedures with dogs. *Journal of Abnormal and Social Psychology*, *48*, 291-302.
- Steinschneider, A. (1972). Prolonged apnea and the sudden infant death syndrome Clinical and laboratory observations. *Pediatrics*, *50*, 646.
- Steinschneider, A. (1974) Living with an apnea monitor. In R. Robinson (Ed.), *SIDS* (pp 318-322). Toronto: Canadian Foundation for the Study of Infant Death.
- Talbot, N.B., & Howell, M.C. (1971). Social and behavioral causes and consequences of disease among children. In N.B. Talbot, J. Kagan, & L. Eisenberg (Eds.), *Behavioral Science in Pediatric Medicine* (pp 1-89). Philadelphia: W.B. Saunders Co.
- Yule, W., Sacks, B. & Hersov, L. (1974). Successful flooding treatment of a noise phobia in an eleven year-old. *Journal of Behavior Therapy and Experimental Psychiatry*, *5*, 209-211.