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Editorial

The impact of pediatric critical illness and injury on families: A review of the evidence

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Every once in a while a paper comes along that clearly makes our work a little easier. The journal *Pediatrics* has just published one such paper - an article that reports on a systematic literature review on the impact of pediatric critical illness and injury on families (Shudy et al., 2006). This presents a critical synthesis of 110 published studies (including two of my own!).

The review authors grouped their findings into five major categories: stressors, needs, specific domains (psychological, physical, social), coping, and interventions. Although it is clear the pediatric critical illness is stressful for the family, the reported effects on parents, siblings, and marital relations are variable. In fact, although many believe that this experience results in permanently harmful consequences for siblings and parents, this is not clearly confirmed by the available data. It is quite evident however that many of these families' needs are unmet.

The authors of this review highlight several limitations of the available evidence. A number of considerations have received very little attention in the research literature. These include: cultural diversity, effects on fathers compared to mothers, siblings, socioeconomic status, and financial burden. These studies also had a number of methodological limitations, such as small samples and many were only anecdotal reports. Samples were predominantly English-speaking, white, with married parents.

It is in fact striking that this analysis is largely limited to Anglo-American societies. It is unclear why this is so. Perhaps family impact research conducted in other countries is not listed in PubMed (the database used for this review). Maybe, this topic is less investigated in other countries. Finally, the authors did not report why they did not also examine other databases such as CINAHL or PsychINFO.

These authors have done us a great service by bringing together an impressive body of data and highlighting (1) the principal findings of this literature and (2) the main limitations of existing studies. This will further inform the ongoing development of family services in pediatric critical care, while outlining important considerations for future research.

Reference

Shudy, M., de Almeida, M.L., Ly, S., Landon, C., Groft, S., Jenkins, T.L., & Nicholson, C.E. (2006). Impact of pediatric critical illness and injury on families: a systematic literature review. *Pediatrics*, 118 Suppl 3, S203-18.

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The Infant with Apnea and Nursing Care Implications

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Abstract
Apnea represents one of the most frequently encountered respiratory problems in the premature infant. It is not known why some infants are affected and others are not, although certain factors have a good predictive value. Nursing measures to prevent and manage apnea are reviewed with an emphasis on parent education and preparation for discharge. Apnea resolves in most preterm infants as they approach term corrected gestational age. However, if it does not, options include continued hospitalization or, for infants with stable apnea, discharge with a home apnea monitor.
Keywords: apnea, ınfant, prematurity, nursing care of, parent education.

Definitions of Apnea
Apneas, defined as a breathing pause corresponding to at least "two missed breaths", are very frequent in the neonatal period, especially in the preterm newborn (1-5). The most widely used definition of apnea specifies a duration of 15 or 20 seconds, although clinically significant apnea episodes, can be any duration if associated with cyanosis, abrupt pallor, hypotonia, or bradycardia (2,6-7).

Types of Apnea
Three types of apneas have been reported in newborns humans: central, obstructive and mixed **(Table 1):**

Central apneas occur with greater frequency in non-REM (i.e., rapid eye movement) sleep, often as periodic breathing, which is defined as the alternation of central apneas and regular breathing. Apneas become predominantly mixed when they are longer than 10 seconds. Purely obstructive apneas are much less frequent (1,8). Central apnea accounts for approximately 10% to 20% of all apnea, obstructive apnea another 10% to 25%, and mixed apnea for the largest proportion, 50% to 75%. In an individual infant, one type of apnea tends to predominate (2,9-10).

Incidence and Demographics
Apnea is a frequent problem in premature infants, with 25% of infants of birth weight under 2500 grams and greater than 80% of those under 1000 grams having apneic episodes during neonatal life (11). It has long been establıshed that the incidence of apnea of prematurity increases as gestational age at birth decreases, occurring in 7% of babies born at 34 to 35 weeks gestation, 15% at 32 to 33 weeks, 54% at 30 to 31 weeks, and nearly all infants born at under 29 weeks gestation. Apnea episodes generally resolve when infants reach 36 to 37 weeks post-conceptional age. However, a high incidence of apnea was identified in pre-discharge respiratory recordings of very-low-birthweight infants within 3 days of discharge from the neonatal intensive care unit. Over 80% of the infants stil had significant apnea spells at 37 weeks (2).

Table 1: Subtypes of Apnea in Prematurity

	CENTRAL APNEA	OBSTRUCTIVE APNEA	MIXED APNEA
CLINICAL	Absence of airflow and respiratory effort	Absence of airflow with continued respiratory effort, associated with blockage of airway at level of pharynx	Prolonged pause interspersed with chest movement but no airflow
CHARACTERISTICS	No chest movement	Continued breathing effort against the obstruction without airflow	Respiratory efforts against obstruction may prolong apnea
CAUSE	Cause of central apnea in the preterm ınfant is not fully understood. Contributing factors are thought to include: **a.** Chest wall afferent neuromuscular signals and chest wall instability. **b.** Diaphragmatic fatigue. **c.** Immature, paradoxical response of neonate to hypoxia and hypercapnia. **d.** Altered levels of local neurotransmitter in brain-stem region of CNS.	Hyperextension or flexion of the neck may induce obstruction of the airway. May be caused by obstruction of airflow at the mouth or nose as a result of anatomic abnormalities such as macroglossia or micrognathia	Elements of both central and obstructive apnea are present

Pathophysiology of Apnea

Apnea and periodic breathing are consequences of an immature respiratory control system and have common pathophysiologic roots (2). These are outlined below.

A. Immature central respiratory center

- Decreased afferent traffic occurs as a result of poor central nervous system myelinization, decreased number of synapses, and decreased dendritic arborization.
- Decreased amounts of neurotransmitters have been measured in infants with apnea and may play an important role in respiratory control.
- Fluctuating respiratory center output has been implicated.

B. Chemoreceptors

- Located in the medulla and the carotid and aortic bodies chemoreceptors relay information to the respiratory center in the brain about Ph, PO_2, and PCO_2 via the vagus and glossopharyngeal nerves.

. Premature infants with apnea do not respond to hypoxemia as effectively as infants who do not have apnea.

. Premature infants exhibit a blunted response to elevated PCO_2, resulting in ongoing hypoventilation and hypercapnia. This diminished response predisposes them to apnea.

- Biphasic response of the premature infant to hypoxia.
- Depressed response to hypercapnia.

C. Thermal afferents
Apnea is increased in an environment that may be too warm for the infant

D. Mechanoreceptors
- Stretch receptors alter the timing of respiration at various lung volumes.
  . Head's paradoxical reflex: a gasp followed by apnea after abrupt lung inflation.
  . Hering-Breuer reflex.
- Pharyngeal collapse and airway obstruction are produced by negative pharyngeal pressure generated during inspiration.
- Intercostal phrenic inhibitory reflex, an inward movement of the rib cage during inspiration, prematurely ends inspiration

E. Protective Reflexes
- Stimulation of the posterior portion of the pharynx with suctioning, endotracheal or gavage tube placement, or gastroesophageal reflux can stimulate apnea.
- Pulmonary irritant receptors can produce an apneic response to direct bronchial stimulation.
- Laryngeal taste receptors can produce an apneic response to various chemical stimuli (3).

F. Sleep State
Apnea occurs predominantly during active REM or indeterminate sleep. Apnea is uncommon during quiet sleep in infants under 34 weeks postconceptional age. During quiet sleep, respirations are more regular and there is less breath to breath variability. The periodic breathing that occurs during quiet sleep is also more regular. During active sleep, lung mechanics differ: there is also more paradoxical breathing, a lower end-expiratory lung volume, and a lower and less stable baseline oxygen saturation. The muscles of the upper airway are also affected by sleep state, making airway collapse more likely during REM sleep. All of these responses increase the preterm infant's vulnerability to apnea during active sleep. Because a preterm infant sleeps at least 80% of the time and more than half of sleep time is spent in active sleep, there are frequent opportunities for apnea (2).

Causes of Apnea
The leading causes of apnea are outlined below.

1. Immature Central Respiratory Center and Hypoxia
Whıle immature respiratory control is the primary cause of apnea in the preterm infant, many coexisting conditions can precipitate or worsen apnea.

2. Respiratory Disorders
Respiratory distress syndrome
Pneumonia
Aspiration
Acidosis
Airway obstruction (airway obstructions are important preventable causes of apnea. Flexion of the compliant neck of the preterm infant can cause a positional obstruction of the upper airway).
Pneumothorax
Atelectasis
Pulmonary hemorrhage
Postextubation status
Congenital anomalies of the upper airway

3. Cardiovascular disorders
Patent ductus arteriosus (apnea can also be a symptom of a persistent patent ductus arteriosus with a large left-to-right shunt)
Hypotension
Arrhythmias
Congestive heart failure

4. Infection
Many preterm infants develop sepsis and/or infection during a prolonged hospitalization. Apnea is a common presenting sign of not only overwhelming systemic bacterial, viral, or fungal infections, but also vascular-catheter-related bacteremias, nosocomial infections, local infections, or abscesses. Apnea can be the fırst manifestation of a respiratory syncytial virus infection, often occurring prior to other respiratory symptoms.

5. Central Nervous System disorders
Congenital malformations
Seizures
Asphyxia
Intracranial hemorrhage
Kernicterus
Tumors

6. Drugs

Maternal drugs

Narcotics
Analgesics
Anesthesia
Beta-blocker antihypertensive agents
Magnesium sulfate

Neonatal Drugs

Anticonvulsants
Cardiovascular drugs
Analgesics
Anesthesia (apnea can also occur up to 72 hours postoperatively in preterm infants recovering from general anesthesia, because of post-anesthetic depression of the respiratory center)

7. Metabolic disorders

Hypocalcemia
Hypoglycemia
Hypomagnesemia
Hyponatremia
Acidosis
Hyperammonemia

8. Hematopoietic disorders

Polycythemia
Anemia (anemia is often attributed to anemia in the preterm infant, based on the assumption that a lowered oxygen-carrying capacity leads to hypoxia-induced respiratory depression)

9. Reflex stimulation

Posterior pharyngeal stimulation
Gastroesophageal reflux (the relationship between gastroesophageal reflux and apnea in preterm infants continues to receive attention. Apnea and physiologial gastroesophageal reflux are both common in preterm infants, prompting speculation of a cause-and-effect relationship.)

10. Environmental factors

Rapid warming
Hypothermia
Hyperthermia
Elevated environmental temperature
Feeding
Stooling
Painful stimuli (2,3).

Consequences of Neonatal Apnea

Short-Term Effects

Apnea itself is not a threat to physiological well-being. What are potentially detrimental are the frequent ventilatory and reflex cardiovascular consequences, including hypoxia, hypercarbia, bradycardia, and changes in blood pressure (12). Bradycardia is usually a peripheral chemoreceptor response triggered through carotid chemoreceptors by the low oxygen level. Bradycardia occurring simultaneously with apnea, prior to desaturation, is likely caused by stimulation of an inhibitory reflex, such as that seen when inserting an orogastric tube (13).

During prolonged apnea with bradycardia, cerebral hypoperfusion could contribute to hypoxic-ischemic injury to the brain of the immature infant (14). Following a prolonged apnea/bradycardia episode, transient compensatory cerebral hyperperfusion could potentially contribute to an insult to the preterm brain caused by hypoperfusion and subsequent reperfusion (15).

Long-Term Significance

The-long term consequences of recurrent apnea and bradycardia are controversial (16,17). Recently, an association between apnea and poor outcomes in some infant subgroups has been reported (18). Like other outcome studies, it is unclear if these events lead directly to lower neurodevelopmental scores or if both cardiorespiratory events and lower scores have a common underlying cause (19). In addition to uncertainty about the long-term sequelae of neonatal apnea, there is the important question of whether or not apnea is a precursor to, or a predictor of, other cardiorespiratory problems in infancy. A history of apnea does not appear to place a former preterm infant at higher risk of sudden infant death syndrome (SIDS) (20).

Diagnosis

A history is essential in evaluating the child with apnea. Ultimately, the issue is to determine the significance of the episode.The physical examination findings are commonly normal, revealing no specific entity to account for the episode. Assurance should be obtained that the child is stable without evidence of cardiac, neurologic, or respiratory disease. Search for underlying conditions (21).

Therapeutic Management

Pharmacologıc Therapy

1. *Methylxanthine* (aminophylline, theophylline, caffeine), administered orally or intravenously, is used to treat apnea of prematurity after pathologic causes have been eliminated (1). These drugs are powerful central nervous system stimulants. A recent Cochrane Database Systematic Review found that both theophylline and caffeine were effective in reducing apnea in the 2 to 7 days after starting treatment. Caffeine is the preferred drug given its lower toxicity.

Methylxanthines reduce apnea through multiple mechanisms. Caffeine and theophylline increase minute ventilation, CO_2 sensitivity, and neural respiratory drive. They also stimulate skeletal muscles, thereby improving diaphragmatic function (1,2).

Secondary Effects

The child should be monitored for the following secondary effects.

Caffeine: tachycardia, cardiac dysrhythmias, increased wakefulness, increased active sleep, gastrointestinal distention, gastrointestinal bleeding, and diuresis with sodium loss.

Theophylline: tachycardia, cardiac dysrhythmias, seizures, jitteriness, feeding intolerance, gastroesophageal reflux, dehydration, hyperglycemia, hypotension, increased cerebrovascular resistance.

2. Doxapram is a potent respiratory stimulant given intravenously for the management of apnea refractory to methylxanthine therapy. Doxapram enhances respiratory center output by increasing minute ventilation, tidal volume, inspiratory flow, and airway pressure.

Secondary Effects

Doxapram is rarely used in the United States, in part because the preparation contains benzyl alcohol. Benzyl alcohol is associated with gasping "Syndrome" characterized by metabolic acidosis, renal failure, liver failure and cardiovascular collapse. Cumulative doses may be toxic for the liver, kidney or brain (1).

Nursing Care

Assesment

The infant's heart rate and respirations should be monitored continuously. The nurse should ascertain that the alarms on the cardiorespiratory monitor are set. If an apneic episode is observed, the nurse should record the time and duration of the episode, the skin color change, bradycardia, and oxygen saturation. The nurse should also describe what the infant was doing before the episode and any actions the nurse took to stimulate breathing (3).

Nursıng Interventıons

The nurse should set the heart rate parameters of the cardiorespiratory monitor according to the infant's age, and the respiratory pause at greater than 15 seconds. Resuscitative equipment should be available and the nurse should be proficient in using it. The apneic infant can be stimulated by gently tapping the foot or trunk or turning the infant over. The infant should not be shaken vigorously. If breathing does not resume, institute bag-and-mask ventilation (3).

Modifying the NICU environment to promote uninterrupted sleep is an important intervention in the prevention of apnea or hypoxemic episodes (22-23). Maintain a neutral thermal environment while the infant is hospitalized and avoid suctioning if possible. In infants with residual lung disease, assess baseline arterial oxygenation with pulse oximetry and aim for a stable oxygen level (2). Cardiorespiratory monitoring alone will not detect episodic hypoxemia when not associated with long apneic pauses. Oxygen saturation monitoring has been recommended for infants known to have recurrent apnea and/or those born at under 32 weeks gestation who have not reached 36 weeks PCA (24).

Care of the upper airway should enhance upper airway patency. Humidify oxygen or room air delivered through high-flow nasal cannulae to prevent drying of the mucous membranes. Avoid excessive or deep nasal suctioning, as it can contribute to airway occlusion by inflicting trauma to and causing edema of the nares (2). Position the infant to avoid obstruction of the upper airway. Avoid excessive neck flexion.

The supine position remains the recommended sleeping position for the predischarge preterm neonate. Infants with oral-feeding-related apnea, bradycardia, and desaturation episodes can usually be managed by "pacing" feedings. Pacing is most important at the beginning of the feeding (25). Observe the infant closely for signs of fatigue. It may be necessary to supply oxygen or room air via nasal cannula for select infants (2).

Dıscharge Plannıng

One important decision to be made in planning for discharge of a premature infant is whether to send the patient home with an apnea monitor (26). The guidelines from the American Academy of Pediatrics "Hospital Discharge of the High Risk Neonate" (27) specify that infants are ready for hospital discharge when they are physiologically mature and demonstrate stable cardiorespiratory function "of sufficient duration" (2). In the absence of event recordings, nursing documentation based on clinical observations of apnea and bradycardia events is the primary means of formulating discharge decisions for individual infants (28).

Dıscharge Educatıon

Teaching about apnea begins early in hospitalization. Helping parents of premature infants anticipate their infant's risk of apnea, before the fırst event, will better prepare them for this developmentally normal and common phenomenon (2). If a home apnea monitor is prescribed, clarify its purpose (i.e., to alert caregivers to an apnea episode, not prevent SIDS). Other essential training for a home apnea monitor includes observation techniques, operation of the monitor, and infant cardiopulmonary resuscitation (2).

Medical and techcical support staff, as well as psychosocial assistance and respite personel, should be available to these families (29).

Home Monıtorıng

Epidemiologic studies have failed to document any impact of home cardiorespiratory monitoring for apnea and/or bradycardia on the incidence of SIDS (30-31). There is no evidence that the presence of apnea and/or bradycardia identifies a group at increased risk of SIDS, that cardiorespiratory monitoring can provide warning in time for intervention to prevent sudden death, or that intervention would be successful in preventing unexpected death. Given the lack of evidence that home cardiorespiratory monitoring has any impact on SIDS, prevention of SIDS is not an acceptable indication for home cardiorespiratory monitoring (29).

Indications for home apnea monitoring include:

- The infant is a survivor of an apparent life-threatening event.
- The infant is a newborn sibling of two or more infants who have died of sudden infant death syndrome.
- The infant is premature and has symptoms of idiopathic apnea of prematurity but is otherwise ready for hospital discharge.
- The infant has a tracheostomy.
- The infant has sleep apnea syndrome caused by a neurologic disorder, periodic breathing, upper airway abnormality, or idiopathic syndrome (3).

Home cardiorespiratory monitoring after hospital discharge may be prescribed for some preterm infants with an unusually prolonged course of recurrent, extreme apnea (as defined previously). The physician and nurses, together with the parents, should consider the potential advantages and disadvantages of home cardiorespiratory monitoring (32-33). The parents of such infants should be counseled regarding the purpose of the home cardiorespiratory monitoring and realistic expectations of what it can and cannot contribute to an infant's well-being (29).

If home apnea monitoring is prescribed, the famıly should be ınstructed in the use of the monitor and in ardiopulmonary resuscitation. Emphasize to the parents that when the monitor alarm is triggered, they should immediately assess the ınfant rarther than focus on the machıne (3).

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Information For Authors

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Send your proposed papers directly to Franco Carnevale (Editor):
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Listening to the Voice of the Child: Methodological issues involved in conducting research with children

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Abstract
This paper is an invited examination of the findings of a recently published study of the moral experiences families living at home with children requiring assisted ventilation (Carnevale et al., 2006). This analysis focuses particularly on the relatively absent perspectives of the children that participated in the study. The paper outlines important methodological considerations that may limit children's disclosures in the context of research, concluding with a discussion and demonstration of methods drawn from clinical practice that may be more effective.

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Introduction
I was invited to examine the data regarding the "voice of the child" in a recent study conducted by Carnevale et al. (2006) investigating the moral experience of families with children requiring assisted ventilation at home.

My experience working with children and their families is a practical rather than a theoretical one. So this paper will reflect that reality. By way of further clarification of the perspective that I bring, let me say that for most of the past 35 years I have worked as a teacher, a pastoral counsellor with both children and adults and particularly during the past 18 years as a pediatric chaplain. I am also the parent of a non-autonomous multi-handicapped child who is autistic, intellectually delayed, legally blind and psychically fragile in addition to having respiratory and other problems related to extreme prematurity. My comments are informed by all of the above.

Before getting to the question of the voice of the child let me say that the authors of this project have done the families of ventilator dependent children and those who work with them an enormous service by conceiving and carrying out this important study. There is a substantial literature out there on children who are ventilator dependent and their families but it deals for the most part with the mechanics of ventilation, the environment surrounding the condition as well as other important aspects concerning this relatively recent phenomenon. But no one up to now, as far as I know, has taken on the study of the moral experience of these families.

As this population continues to grow one can hardly overestimate the importance of getting at the existential reality of these children and their families. I believe that the findings of this study will have importance for future treatment, for healthcare education and for the overall psychosocial and spiritual care of these families. I would also like to congratulate the team for the richness of the data: we now know much better some of the overwhelming experience and formidable challenges that these families face. And may I add that I was impressed by the courage and pluck of the interviewers who conducted these sessions and interviews and kept going when at times it must have been hard to listen. One cannot help but feel sympathy and admiration for the transformation that they underwent carrying out their sessions and interviews.

Examining children's silence

If one is impressed by the richness and quality of the data gathered on the moral lives of the families one is equally struck by the paucity of data coming from the children, both patients and siblings. Indeed, in the summaries provided to us, the principal investigator expresses surprise and one detects some disappointment that the children were "strikingly silent". The investigators postulate three possible reasons for this: a) the children are genuinely content and have no particular malaise to talk about, b) they are socialized into the family's "official policy" that everyone in the family is to think positively and do their best to make things work, or c) these children's experiences are beyond the realm of verbal articulacy - that they do not have words to express their unique experience.

The first explanation (i.e., they are content) strikes me as unlikely and counterintuitive. To illustrate why, allow me to speak from personal experience for a moment. Let me reach back 50 years (my God has it been that long) to when as a preteen I was hospitalized for a serious relapse of hepatitis. During that stay, because the doctors who came by every morning to examine me had drawn lines on my abdomen I was convinced and indeed terrified that they were going to perform surgery on me. After a couple of weeks of such worrying I was totally relieved when the nurse told me I would probably be going home in a few days. When I asked her what the lines on my belly meant she explained that they allowed the doctors to keep track of how my liver was doing. Now, at the same time, I was also very worried about my younger sister who had been on the same paediatric ward as I since the summer and who was still partially paralysed from polio. The kindly nurses rolled her bed to my window several times during my stay so that we could see each other. Moreover, I was also very frustrated to learn during this time that since I had missed so much school I was no longer going to be allowed to skip the Seventh Grade. There was a jumble of worries and fears going on in my head and yet all the nurses and my parents thought I was in such good spirits. The fact is that as a 12-year-old boy it did not occur to me to share these problems. One did not do that. I suspect however, that had one of my favourite teachers, one that I liked and trusted – one who was so inspiring, she could have got me to talk if she had the opportunity. But sharing my worries was not what I did at that age. So I am not at all surprised that one of the adolescents in this study is quoted as saying, "I don't want to talk about it."

The second explanation suggested, socialization into the family's official policy, strikes me immediately as being more likely. In the summaries of the data I was provided, I found only 10 or 11 quotes directly attributed to the ventilator dependent child. There were a few more comments about the patient attributed to siblings but the vast majority of information about the child came from the parents. In many of the passages cited the parent actually answered the questions that were directed to the child. As a result the voice of the child is silenced by the initiative taken by the parents to represent their children.

In one case with two teenagers aged 17 and 19 with Muscular Dystrophy the mother says, "I think one of the biggest mistakes we made from the beginning with this whole thing was that we did all the talking for them." She also describes the two children as "shy, quiet and not asking for things" and she adds, "I think one of the biggest problems for them is loneliness." She also tells us that they are happy. But we do not hear any of this from the children.

In another case, a father who spoke of trying to encourage autonomy in his son also mentions the problem by saying, "it was my ex that spoke for him, or his sister." In this same case it is also apparent that the medical staff reinforced this silencing of the child's voice by only speaking to the parents and not the child. As the father said, "I kept telling them, 'say it to him. I'm right here. I will understand.' Because you are always the third person but they always spoke about him and he was the third person" (my summary translation).

One could supply further examples from the data but I think it is pretty clear that from the beginning the necessity of the parents to

speak for and advocate for their child in a system that doesn't always appear to be responsive, becomes a way of life for the family and is reinforced inadvertently by the treating health care professionals.

Other professionals in the child's life also speak in place of the child. In a front-page story in the Montreal Gazette on Sunday April 25 (2004), there is a very moving account of the life of Erik, a ventilator dependent child who lives at the Montreal Children's Hospital. According to the Gazette account while Erik was at school, one of his teachers in the presence of Erik tells his attendant that Erik would not be able to go on a field trip because his mother could not get the time off work to accompany him. For field trips, Erik had to be accompanied by two people. Erik was upset but only his attendant noticed. In not addressing Erik directly there was no malice intended here, only an understandable tendency to ignore the child and to speak to those who take care of him. But the result is that the child is not given a voice.

The third explanation, namely, that these children's experiences are beyond the realm of verbal articulacy is much harder to determine. If what is meant is that the naming of the feelings and the movements of one's inner life are beyond the state of the child's linguistic or cognitive development then we have evidence for that among the younger subjects of the study particularly for four cases – one child was 19 months at the time of the interview. On the other band, the older subjects (two who were very articulate) were able to express their feelings in some cases remarkably well. So one might ask the question is this inarticulacy mostly a function of age and development or is there something in the moral experience of the child that really does surpass his/her ability to articulate? Is it perhaps akin to those experiences that many of us have had even as adults, deep sadness or trepidation or even wonder and awe that somehow we can't put words to? I suspect that it may be a bit of both. But at this stage it seems to me that we really do not know.

Rethinking methodologies

I would like to suggest that there may be a very different reason that could help explain the silence of the children: *the design of the study***.** When I first read the description of the study it struck me immediately that the design was well crafted to capture the voice of the parents and adults. And indeed it does that very well as we can see from the abundance of data gathered. However, there are no specific provisions for gathering data from children. They are expected to participate in the family sessions just like the adults. Family therapists are well aware that it often takes a couple of sessions before the children are comfortable enough and feel safe enough to share openly with a stranger in the company of their parents. Moreover, experienced therapists have a variety of techniques, which are designed to put children at ease and to facilitate the process. The second observation I would make is that although it was expected that there would be individual interviews with the child, there are in fact very few. So, the reality is that the children did not really have an opportunity to share on their own and outside the presence of those who tend to speak for them. How could they for example express deep distress or desperation, profound sadness or possibly feelings of anger at God for their situation, or anger at their doctors or even at their parents in such a setting? Their dependency on their families, especially their parents, and their need to protect them and to make the best of it would likely prohibit any such expression of feelings. That some ventilator dependent children have strong feelings about their medical condition and quality of life can be illustrated by the case of an adolescent I will call Jenny.

Jenny was 15, shy, had difficulty communicating verbally, became ventilator dependent and had lost almost all physical autonomy. The young female chaplain who saw her twice a week for 45 minutes each time described Jenny as being in deep despair much of the time. It is a tribute to the quality of the relationship established that the chaplain was able to work with her over a long period of time. In fact her visits were much appreciated by Jenny in spite of her lack of any belief in God. As she once said, "I have never believed in God. If God existed I would not be in this terrible situation. Nobody would ever want to be in my place. So leave me alone with all that spirituality

stuff. It doesn't change anything in my life." Jenny also shared very openly with one of our Child Life Specialists (CLS) who saw her every day for many months. On one occasion she vented her anger in the following words (I shall quote her in the original French which has its own power of expression), “Bof, je suis tellement en <crisse> , regarde ma vie c'est tellement injuste, t'aurais-tu voulu être poignée d'même quand t'avais 15 ans? De toute façon y a pus rien d'intéressant dans la vie." {I'm so bloody mad, look at my life, it's so unfair, would you want to have been trapped like this when you were 15? In any case there is no longer anything interesting in life for me.). She also shares with the CLS that she had felt abandoned by her parents from the beginning because according to her they had never had enough time for her and did not visit her often enough. She also expressed anger that they had other children after her when they knew she would require so much attention. With the chaplain she said she had no future and no hope. The CLS shared with me in a verbal communication that she wished Jenny had something spiritual in her life, something to hang on to. But there was according to her only the present moment with all its desperation. There was no sense of transcendence in Jenny's life. The staff tried hard to lighten the burden by bringing in Jenny's favourite pop star Roch Voisine on two occasions and these moments were very much enjoyed but it ended there. It is worth mentioning that we have these glimpses into Jenny's life because her parents were absent for long periods of time because of problems of distance. Hence, the staff and particularly the CLS and the chaplain were able to establish a strong and meaningful direct relationship with her.

My third observation would be that professionals (child therapists, child life specialists, paediatric chaplains and others) who spend their days talking with and listening to children who are ill, disturbed or traumatized are careful in establishing a solid relationship, particularly one of trust before exploring the inner life of the child. Moreover, when they do so they are trained to employ a wide variety of techniques designed to put the child at ease as well as to elicit information. These techniques (their bag of tricks if you will) must be adapted to the age of the child. Barbara Sourkes, a child psychologist and former colleague, has written two books that deal extensively with her work with children with cancer: *The Deepening Shade* (1982) and *Armfuls of Time* (1995). In them she describes in great detail how she uses art in her sessions with children. She also uses teddy bears, books and other props and techniques. But even more important than the use of age appropriate interviewing techniques and props is the quality of relationship that needs to be established for good communication with children. One cannot read the books of Robert Coles – for example *The Spiritual Life of Children* (1990) or *Moral Life of Children* (1986) without being impressed by the quality of trust to be found in the relationships he has with children. One thinks of Ruby the little girl caught up in the school segregation crisis in New Orleans who spoke so openly and trustingly. Robert Coles kept in communication with dozens of these children he interviewed over several decades.

Among the many props and techniques one can use, one of my own favourites for working with children is a simple deck of cards. For purposes of illustration only and with your indulgence, let me share with you a case from pediatric chaplaincy. It is not with a ventilator dependent child but with one who has been traumatized. However, the simple technique should have similar results.

The case of Jean-Pierre

If children sometimes find it difficult to share their feelings in the presence of their parents and family they do not necessarily find the face-to-face interview easy either. They may find the situation too intense or boring or they may be experiencing a great deal of anxiety. A simple game of cards with the child may allow the conversation to take place in a more relaxed setting and takes the pressure off the child. It allows the health care professional to quickly establish a friendly relationship with the child and communicates an important message of empathy and support. At the same time it gives the child something to do to relieve the boredom and provides him/her with an outlet

for pent up energy. In the case of the anxious child it provides a ready-made distraction when the conversation touches upon areas that are painful or frightening. The following example illustrates how a chaplain went about this task.

Jean-Pierre was an eleven-year-old boy who was hospitalized after being severely beaten by his mother's boyfriend. The chaplain was called to the ward by the head nurse who informed him that Jean-Pierre was in good spirits and had been extremely polite and cooperative. However, she also found him restless and bored. They were concerned that he would not discuss the incident with the nurses but felt that he needed to talk. When the chaplain arrived at his room he was alone and seemed glad to have a visitor. He was friendly, engaging and talked quite easily. The following conversation illustrates the chaplain's approach.

Chaplain: Hi, Jean-Pierre, my name is Don. I'm the hospital chaplain. Do you know what a chaplain is?

Jean-Pierre: Is that like a priest or something?

Chaplain: That's right. Only I work here in the hospital rather than in a church. I visit with kids who are patients here. I was wondering if you might like a visit.

Jean-Pierre: Sure. Do you want to sit down?

Chaplain: Okay. I'll just pull this chair over. So, Jean-Pierre how are you doing today?

Jean-Pierre: Pretty good. The nurse said the Montreal Expos are coming to visit today. I hope I can get some autographs.

Chaplain: That sounds like fun. Who is your favourite player?

Jean-Pierre: Pedro Martinez.

Chaplain: He's my favourite as well. Jean-Pierre, I've got a deck of cards with me. Would you like to play some cards?

Jean-Pierre: Sure! Can I go first ?

The card game goes on for a white. After a few minutes of ordinary conversation the chaplain ventures a question about his hospitalization.

Chaplain: So, Jean-Pierre, what brings you to our hospital?

Jean-Pierre: Well, uh… My Mom's chum beat me up.

Chaplain: My gosh, that must have been scary. ...

Jean-Pierre: No. It wasn't so bad. It's your turn. (Game continues for a while)

Chaplain: Why do you think your Mom's chum beat you up?

Jean-Pierre: He was just in a bad mood. He gets that way sometimes. He wasn't really mad at me. Got any fives? (Game continues)

Chaplain: Nobody ever beat me up like that. What was it like?

Jean-Pierre: He hit me for a long time with his fists. I couldn't get away.

Chaplain: Wow. That must have been pretty scary.

Jean-Pierre: Yeah.

Chaplain: Were you scared?

Jean-Pierre: Yeah. I was pretty scared. He wouldn't stop.

Chaplain: I guess your mom couldn't stop him.

Jean-Pierre: No. He hit her too and pushed her away.

Chaplain: Boy, I would have screamed my head off…

Jean-Pierre: I did. I screamed and screamed but he wouldn't stop.

Chaplain: That must have been awful….

Jean-Pierre: It's your turn again. (Game continues)

Chaplain: Do you know when you are going home?

Jean-Pierre: In a few days. Maybe before the weekend.

Chaplain: How do you feel about going home?

Jean-Pierre: Good. It's better than staying here.

Chaplain: Do you think you might have any more trouble with your Mom's chum?

Jean-Pierre: No. I'm going to live with my foster mom, where I used to live.

Chaplain: Good. I'm sure you'll be safe there.

Jean-Pierre: Yeah. Your turn.

The conversation and card game continued for a while.

The card game was useful in several ways:

1. It allowed for a good conversation with Jean-Pierre while doing something interesting at the same time.
2. The card game gave Jean-Pierre a means for withdrawing from the conversation about what had happened to him. When he became uncomfortable, he simply retreated into the game.
3. The card game helped to keep the conversation going while preventing it from becoming too intense.
4. It provided Jean-Pierre with a much needed opportunity to talk the incident in a non-threatening and non-intimidating way.

Conclusion

To conclude my remarks, one might think from what I have said about the absence of the voice of the child that this is simply a weakness of the study. I would like to suggest, on the contrary, that this is what theologians might call a "felix culpa" a happy fault. For had the study not revealed the extent of the silencing of the voice of the child we might never have known just how little voice the child has in his own care and how little opportunity he has to share what he experiences with others, even with his own family. This in my view is a very positive result. However, it is also clear that the child's voice still needs to be beard. It is important for the child, for his parents and family and for the healthcare professionals who take care of him. My hope at this point is that it will be possible for the investigators to do a follow-up study, which would concentrate exclusively on the children and gather from them in appropriate circumstances and using child-centred techniques adapted to the age and situation of the child the moral quality of their experience. I think that if such a follow-up were possible it would add immeasurably to the value of this study.

The investigators of the study asked me if I had any suggestions for a follow-up study. I am not a researcher, just a practitioner. However, here are just a few hints about such a future study from my perspective.

Suggestions for follow-up

1. Interviews should take place with the child without the parent being present.
2. Interviewers should be trained in techniques for interviewing children.
3. Interviews should be geared toward the age of the child. It is important to create a situation where the child is not forced to have eye contact.
4. Some of the following games and techniques work well with younger children (according to age):
   a. The telephone game
   b. Island Fantasy
   c. Magic Wand
   d. Projective Storytelling
   e. Life story
   f. Road of Life
   g. Hangman

   With older children one might suggest:
   Guessing Games
   The Debate
   Talk Show (and there are many more)
5. Interviews should be geared to explore some of the themes that arose or were hinted at in the main study. Some of these might be: isolation, fear of abandonment, existential anxiety, fear of dying, sources of personal strength, hope, despair, sources of joy and pleasure, where is God in all this.
6. In the unlikely event that a child experiences distress, the interview should be concluded immediately but caringly and as much as possible on a positive note. Therapeutic back-up should always be available if needed.

Let me conclude simply and without flourish. This is an important study. It has provided a wealth of important data. It has discovered and drawn attention to the absence of the voice of the child in his/her own care. That voice still needs

to be heard. I very much hope that it will be possible for the research team to carry this study one step further so that the moral experience of the ventilator dependent child can be given the voice that so needs to be heard.

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The 1st International Symposium of Pediatric and Neonatal Critical Care Nursing held in Brazil

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Abstract
This paper reports on the ***Ist International Symposium of Pediatric and Neonatal Critical Care Nursing*** was held in São Paulo, Brazil, on June 28th to 30th, 2006, by the Nursing Department at Federal University of São Paulo. The principal themes that were addressed and participant feedback are outlined. Dr. Martha Curley was an invited keynote speaker.

The ***Ist International Symposium of Pediatric and Neonatal Critical Care Nursing*** was held in São Paulo, Brazil, on June 28th to 30th, 2006, by the Nursing Department at Federal University of São Paulo. It was organized by the Nursing Post-Graduate Research Program and sponsored by NECAd - a Group of Studies in Child and Adolescent Nursing Care and a government official agenda for research (CNPq).

The aim of the symposium was to discuss the state of the knowledge and art in Pediatric Critical Care Nursing with experts in this area, focusing on nursing teaching, research and clinical practice.

It had an exceptional participation of 345 nurses from different Brazilian States. The participants were nursing professors, students, clinical specialists and assistant nurses in pediatric and neonatal in intensive care. They took part in a two-day intensive program, with enthusiastic involvement, questioning and reflecting on issues related to the practice of pediatric critical care.

The program involved 20 local invited speakers and the international invited speaker Dr. Martha Curley, from Boston Children's Hospital and Harvard Medical School, USA.

On the first day, Dr. Curley was the keynote speaker and presented a lecture entitled *Pediatric and Neonatal Critical Care Nursing: victories and challenges*, which embraced all of us on a large journey to the most important conquest in this area. She pointed to future directions, emphasizing the need to improve professional standards for nursing and the relationship of pediatric nurses with other health professionals, as well as with patients and their parents.

After this magnificent opening we undertook discussions of a variety of current nursing concerns in the pediatric intensive care unit (PICU), like patient safety, a very real and important concern debated by Brazilian professors from the main universities of the country. They discussed ethical implications of nurses' practice in the PICU, medication errors, the culture of safety in nursing practice in this context, and the continuous seeking of innovations and support of pediatric critical care nursing through scientific evidence.

Next, a round table discussion about Family Centered Care in PICU was led by Dr. Curley and Dr. Margareth Angelo, a Brazilian nursing professor, showing the similarities of definitions, aims, and applications despite the cultural diversities in approach, as well as the possibilities for

integrating assessment and interventions into nursing practice based on theoretical models and research studies.

The first day's program emphasized evidence-based practice in the management and care of neonates and children with pulmonary diseases (e.g., ARDS, acute lung injury), use of mechanical ventilation, and prevention of ventilator associated pneumonia. The presentation resulted in lots of questions from the audience to the speakers, showing the need for actual scientific knowledge on these issues to support clinical practice.

An animated and controversial presentation of North American and Brazilian research and practice experiences with prone positioning, point to different concerns while highlighting the importance of applying research results into practice.

Finally, very late in afternoon, the participants had the opportunity to discuss controversies in caring for children and neonates during mechanical ventilation. Discussions related to the use of open and closed suctioning systems, hyperoxygenation and hyperventilation, humidifiers in mechanical ventilation, and family presence during endotracheal intubation.

On the second day we started the lectures with a round table that discussed trends and challenges of monitoring patients in the PICU. Clinical nurse specialists from different hospitals shared their experience and concerns with monitoring non-invasive arterial pressure, central venous pressure and intra-abdominal pressure. In sequence, a conference on the adverse effects of the PICU environment on children, neonates and the family revealed a key theme that needs more discussion, given its relevance to nursing practice and the potential to contribute to change in our daily activities.

Also included in the program was a round table discussion about the incorporation of ethics, aesthetics and personal aspects into nursing care in the PICU. Participants expressed that this was an essential discussion for them because it helped them to reflect and deal with dilemmas and difficulties that are posed in nursing everyday practice. A comprehensive approach facilitates the understanding of subjective experiences, so the lecturers discussed collaborative practices between nurses and families, the family's experience with an extreme preterm baby in a NICU, and the family's and staff's experiences with grief and death in the intensive care unit.

Dr. Curley then contributed with two sessions: nursing interventions in septic shock and pain assessment and intervention with children and neonates in ICU, followed by a conference with Dr. Heimar Marin, an internationally recognized nurse specialist in informatics from Brazil, regarding information technology in nursing practice, which greatly stimulated thought about the use of these resources.

The last round table referred to the integration of practice, research and teaching in nursing care in PICU, aiming at promoting an interchange of knowledge and experience between nursing specialists. Questions were posed to the specialists who then briefly stated their thoughts. More questions and discussions with the participants were then stimulated.

Participant evaluations revealed that they had a great time. More than 90% reported that their personal objectives for attending the symposium were met. The presentations were considered well organized and the content was very well presented. They affirmed that the lectures included enough time for questions, which was considered fundamental because it allowed for discussion of their concerns. The conference content was evaluated as relevant by the majority of participants. They also considered the excellent contribution of Dr. Curley's visit to our country because of the opportunity this provided to strengthen their knowledge concerning nursing practice in PICU, awakening them to scientific research and application of theories to clinical practice.

On June 30th, a meeting in the nursing department (supported by the Pediatric Nursing Post Graduation Program) was held to discuss the Synergy Model and research programs in Brazil and the USA with the goal of establishing international cooperation.

We can concluded that it was a magnificent event for pediatric critical care nursing in Brazil, contributing to advances in practice, teaching, and research for the nursing discipline.

Monitoring of Non-Invasive Blood Pressure

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Abstract
This lecture was presented at the 1st International Symposium of Nursing in Pediatric and Neonatal Intensive Care in the city of São Paulo - Brazil (June 2006). The author offers supporting evidence for understanding non-invasive blood pressure measurement methods. Also examined are studies that search for methods that minimize measurement errors.The oscillometric method is often cited in the literature. Although it the most frequently used method, it also seems to result in less accurate values. Additional studies on pediatric patients are required to validate these findings.

Key words: blood pressure, non invasive blood pressure, pediatric nursing

The topic I was asked to present at this Symposium refers to indirect blood pressure measurement methods. When taking into consideration this vital sign within the complex environment of pediatric intensive care, you may possibly underestimate its importance, due to the special and sophisticated equipment that the technical market has to offer; especially in the past 10 years. But it is as from the Systemic Arterial Pressure (SAP), many times obtained only through an indirect method, that a series of therapeutic measures are taken when caring for a critically ill child.

It is possible to note in the literature a large number of scientific reports that examine responses to medical treatment of systemic arterial hypertension or shock. However, many do not address, or even, state explicitly the method used to measure the blood pressure. We basically have four methods for non-invasive blood pressure (NIBP) measurement. These include 1. auscultation, 2. oscillometric, 3. ultrasonic, and 4. plethysmographic methods.

The non-invasive measurement of blood pressure began with the introduction of the sphygmomanometer with a mercury column by Riva-Rossi, in 1896. However, it was in 1905 that the auscultation method (Korotkoff) was introduced in the clinic and is still being used, without any significant changes[1-3].

Progress in NIBP measurement can be attributed to various difficult to control factors that can modify the result, jeopardizing the accuracy of the measure[4].

Use of the auscultation method has been diminished because of several factors: use of the mercury manometer has been discouraged for ecological reasons, difficulties with calibration of aneroid gauges, pressure sores resulting from the cuff, debates regarding appropriate body sites for measurement, the clinician skill and controversies regarding cuff size. Studies have indicated that the ratio between the brachial circumference and the cuff width (resulting in reduced error as the ratio approaches the optimal value) should be 0.46[4-6].

When analyzed for their theoretical significance, these concerns usually make their application more difficult in practice, especially when referring to pediatric intensive care[4].

Ultrasonography is another available technique for blood pressure measurement. The speed of the blood floww is measured via Doppler, resulting in a blood pressure value. This method has been used to visualize the thickness and compliance of arteries, mainly as a specific exam to measure predictors of heart disease, rather than measuring SAP[7].

Although it is used in research with good accuracy, it may not be as viable in clinical practice due to the high cost and specialized expertise required for accurate measures[7-8].

Automatic measurement equipment for non-invasive blood pressure through the oscillatory method arose on the market around 1970, little after microprocessors appeared. Thus, sensors replaced the stethoscope, in order to detect the Korotkoff sounds. Up to the end of the seventies, this method was implemented mainly in surgical theatres, to enable the clinical patient monitoring when undergoing anesthesia[3,9].

Bio-engineering developments gradually made this method attractive to the hospital community (and outside as well), by offering an objective instrument that is not conducive to the influence of the observer, not dependant on external auscultation devices, while allow a series repeated measures. Another positive aspect is the simplicity in executing the technique and the low risks involved with its use, compared to the auscultation method, concerning the frequency or severity of purpuric lesions[10-11].

Nevertheless, a case was reported in the United Kingdom describing the development of skin necrosis by hypoperfusion, in an elderly critical patient, which occurred due to automatic cuff inflation every 15 minutes (with alternation of the arms every four hours)[12]. Other reported complications include: compressive neuropathy, petechial rash, ecchymoses, thrombophlebitis and venous stasis[13].

Regardless of these potential risks, the use of this method in clinical practice was accepted and incorporated ino our environment during the last 20 years, but apparently without related scientific investigations and/or standardization through guidelines[3,14]. Confirming this fact, a British study revealed that 90% of the monitors available in the European Market were not validated by clinical studies[15].

The trend observed in research has indicated that use of the oscillometric method commonly fails regarding the ratio of cuff sizes and arm circumference. Also, it reproduces values with a smaller variation than the conventional method, though lower. This can be noticed especially in the diastolic pressure, for adults or children. It can also result in an arterial hypertension (around 17%), if the pressure decrease is treated indiscriminately[9, 14].

An alternative to this bias is the use of the mean arterial pressure. The literature agrees that this data is less affected by change of blood vessels tone than with systolic and diastolic pressures, because it is obtained when the variations reach their biggest amplitude in the cuff deflation[3, 9]. Given the elative lack of accuracy associated with NIBP methods, direct measurements are still required for critically ill children or neonates in the intensive care setting[16].

Regardless of the problems outlined above, oscillometric SAP measuring devices are still commonly used in practice. However, they present a problematic accuracy. It is therefore necessary to conduct additional randomized clinical studies in order to better analyze the measures in different groups[15].

Regarding accuracy, studies with adults and children have been conducted to evaluate if the modified oscillatory method (which generates continuous values of the pressure with a waveform) provided more satisfactory results. However, these studies are still in progress and with limited samples. They therefore require further replication[17].

The plethysmography model described by Penaz in 1973 has been used for continuous measurement. The plethysmographometer is adjusted on the middle finger of the hand through pneumatic regulation, registering a reading in mmHg through the infrared light, which records immediate pressure variations. Some scholars who have evaluated this method, concluded that when compared to invasive measures, it presents slightly higher systolic pressures – a difference that is statistically yet not clinically significant. Correlational data demonstrated that mean arterial pressure is more accurate data[18-19].

Besides the efforts to demonstrate the accuracy of this procedure, researchers have also tested devices for the ankle and arm in adults. This remains a method that is scarcely disseminated in practice, especially in Brazil, since clinical research

has involved limited samples and do not consider carefully examine the pediatric patient[20]. This raises some important questions: How to adjust a sensor on a middle finger of a newborn's hand? What are the risks of causing a burn?

Although oscillometric method NIBP measurement is the most used method in professional practice, scientific data suggest it has limited reliability[21].

Another big question to consider is the scarcity of original studies and their replication to the pediatric and neonate intensive care population. Therefore, the big challenge has been to seek the integration of scientific evidence with practice, which can support the complexity of the nursing, without separating art from science.

We consider it extremely important that the nurse be aware of such knowledge concerning SAP measurement. This relies on science and not on ritual, as it was for the beginnings of the profession, constituting the essence of nursing care and for this reason cannot be seen as common sense.

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Ethical Implications of Errors in ICU Nursing Practice

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Abstract
This article discusses general considerations on ethical nursing practice relating to errors in ICUs, according to the bioethical principles of beneficence and nonmaleficence. In the health care context, the need for error analysis under a systemic focus in a safe non-punitive culture is highlighted, so that effective preventive measures are adopted in such services. It is a mandatory ethical commitment for nurses working in ICU that they provide care to assign a priority to patient dignity in a system that ensures more protection and less risks and failures.

Introduction

The ethical implication of errors in intensive care nursing practice requires some consideration of the general ethical aspects of the profession.

The first relates to nurses' competence whose main basis is "know how to behave", a mandatory ethical component in nursing practice, which complements scientific knowledge. This involves 'know-how' skills, including knowing how to interact with each other.

The second, according to Anne Davis[1], refers to the fact that nursing has never considered ethics an unimportant issue or a kind of fashion. Nursing history has shown a growing literature, as well as a number of ethical activities in professional associations, in codes of ethics and health care standards and protocols. According to Davis[1], "nothing has been irrelevant to the permanent and intentional commitment with ethics for the nursing profession".

The third aspect concerns the technology that has been developed in recent decades. It has brought new and complex challenges to the health care professional and has become a core focus of ethical discussions.

In this sense, in the face of the diagnostic and therapeutic tools available for health care and the appeal for technological innovations for consumers, the problems these professionals will face tend to be more and more of an ethical nature than technical.[2] Therefore, this reality reinforces the great number of ethical problems present in the daily life of the nurse, especially in the intensive care area. It is within this perspective that actual and potential errors take place in ICU practice.

Errors concerning health care and the principles approach

Is it an error, critical incident, adverse event or iatrogenic occurrence? Such controversial terms, frequently found in the literature, can be considered synonymous for undesirable but preventable events. They are usually of a harmful or damaging nature that may compromise the safety of patients that the health care professional is responsible for. In summary, it is a kind of event, fact or occurrence that is out of the normal and expected course of a treatment or care. It can cause unexpected consequences to the patient, professional and institution.

The assurance of safe nursing care for the patient is not an easy task, considering the numerous possibilities for mistakes in a hospital environment, a place with many patients who require increasingly complex treatment and a growing number of invasive procedures. The literature has highlighted concerns about errors related to medications, falls, burns, hemorrhage, pressure ulcers, among others, as a result of mistakes made during the patient's stay in the ICU.

The nurse, who usually faces such events as a direct participant or as an observer, very often has conflicting feelings that provoke emotional stress and disillusionment with the profession.

Despite the different approaches used to analyze ethical situations involving mistakes, the principles model has been highlighted in the scientific literature on health and nursing.

The principles approach proposed by Tom Beauchamp and James Childress[3] highlights four principles that the authors believe should govern our moral judgments, namely nonmaleficence, beneficence, respect for autonomy and justice, which can be related to mistake making.

The nonmaleficence principle implies not causing harm to others. The term 'harm' is not restricted to physical aspects, such as pain, incapacities and death, but also the psyche, social, moral and harms caused to others.

Beneficence means 'doing good', 'caring for health', 'favoring quality of life' - in short, expand benefits, avoid harms or at least decrease them. Whereas beneficence almost always implies active care, which requires transitive action, nonmaleficence, many times involves abstraction, implying only to refrain from carrying out an action that may cause harm.

Nurses' and the entire multidisciplinary team's ethical commitment in ICUs is to give intensive care, that is, reestablish vital functions in a severely ill patient, in a safe environment, free from risks and failures in order to not cause additional harms. Therefore, in the face of any deviation concerning care, the occurrence of ethical transgressions is real in so far as ethical principles such as nonmaleficence and beneficence were not followed. However, it is also certain that there was failure concerning the patient safety system that involves much more than a unique actor involved in the caring process. It is a complex system constituted of several sub-systems that are interrelated and consequently inter-dependent. In this context, patient safety, as care free from risks and failures, depends on the adequacy not only of the structural resources available (financial, physical structure, human resources, material and equipment, normative and administrative structure), but also the processes to develop caring-related activities.

Therefore, in the face of an error, an analysis of the conditions of the unit, which involves the physical environment, quality and quantity of personnel, availability and quality of materials and equipment, and work procedures, among others, will allow effective preventive interventions. Besides that, it can point out a failure in the system as a whole, including other actors and sectors, broadening the ethical commitment of the professionals beyond the bedside. This way, more than searching for guilty parties, existing fragilities in the process as a whole can be assessed and pro-active measures adopted in order to prevent risks[4].

In ICUs, these are important measures where life is in danger, at a moment of great instability and risk to death. In these conditions, the ethical commitment of professionals toward patients' lives demands the prevention of any adverse event or error.

With reference to Normative Ethics, in the Codes of Ethics for nurses in several countries, as well as in Brazil[5], there is explicit reference to the duties and

responsibilities when one is faced with an error in nursing practice. These highlight duties on how to "Give the clients a nursing care free from risks…." (art. 24), "Protect clients against harms from any member of the Health Team" (art. 33) and their correlating concerning responsibilities, that is, "Assure that client nursing care is free from harm…" Therefore, normative ethics with its rules and guidelines aim to assure behaviors and ethical actions performed by professionals with the objective of assuring quality of the care for the patient and community.

Final Considerations

Professional ethical commitment to patient safety is nothing more than giving care to severely ill patients, respecting their autonomy and dignity as human being in a system that provides the best protection and the least risks and failures. In recent years, professionals working in different health care sectors worldwide have been making great efforts to prevent errors in nursing practice[6].

A non-punishing culture concerning mistakes, anonymous incident reports, and professional training, among others, are recognized as important strategies toward reducing risks in nursing and health care[4,6].

Even though humans are inherently fallible, making nurses vulnerable toward committing errors, errors can be prevented by designing systems that prevent people from doing the wrong thing and enable people to do the right thing.

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Teaching Pediatric Pain Management in Cambodia: An eye opening experience

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Abstract
This article is a brief portrayal of my first humanitarian mission with a French Non Governmental Organization, *Douleurs Sans Frontières* (DSF). I share my enlightenment brought on through this special teaching experience in Cambodia, as well as reflections on how culture and additional factors can influence pain management. Some of the cultural boundaries encountered are described. A portrayal of the medication delivery system realities witnessed during my teaching sessions is depicted. Final thoughts and hopes for the future are expressed.

Introduction

This is a short chronicle regarding my unique teaching experience in the field of pediatric pain management with a French Non-Governmental Organization (NGO) "Douleurs Sans Frontières (DSF)" (www.douleurs-sans-frontieres.org). I had never done this kind of work or taught to an audience of a different culture, background, or living realities as mine, which is why this experience was so rich and insightful. In countries where poverty and major deficiencies in resources are predominant, providing good pain management is often put aside. DSF provides help in Cambodia at many levels: they run a 33 bed palliative care unit since 2003, they offer pain consultations in several adult hospitals, and they give many education programs in pain management, one of which, just recently, focusing specifically on pain in children.

Before my story begins, a snapshot of the socioeconomic state of Cambodia is essential to have a better understanding of the current issues that this nation is facing. The total population is estimated to be close to 13.5 million people of whom 50% are less than 20 years old. Life expectancy is around 59 years but it is increasing rapidly. The average income of the Cambodians remains considerably low. In 2003, 75% of the population lived on less than two US dollars per day. Thus, 40% of the population is living under the poverty level. In Cambodia, health care is subsidized. This serves directly in the functioning of the hospitals and in providing pay for the health care workers. For example, a physician is usually paid about 30 US dollars per month by the state; the rest comes from the remuneration provided by the patients (hospitals), NGOs or by private consultations. But this is usually not enough; thus, health care workers often have other employment. Poverty being so predominant, many patients can't afford these services, which is why the help of the NGOs is of such importance.

Different Realities

Not knowing what to expect, I began teaching like I usually do in my role as an acute pain clinical nurse specialist. My thinking was that we were all health professionals working with children and thus, had received similar training. Although this is true, I soon found out that culture, language, and sociological and environmental factors had to be taken into account if I wanted to reach the participants. I had taken for granted many basic notions that I thought were universal but to my great surprise were not. For instance, attributing a number between 0 and 10 to quantify the pain intensity is something rather foreign to the Cambodians. Thus, I spent many hours just explaining the principles of pain assessment with self report scales like the Visual Analogue Scale (VAS). Quantifying pain intensity with words (i.e. low, medium,

high, and extreme pain) seemed to be much more congruent with their view of pain evaluation. Furthermore, I learned that it is unusual for doctors and nurses to ask patients to rate their pain especially with numbers. Health care delivery remains very patriarchal as the physician knows best and does not involve the patient/family in their evaluation. They know how much pain the child has; hence, asking the patient to rate their pain level with a scale seems insignificant.

Of utmost importance was that I had to build my credibility since many of the themes and notions taught during the seminar were new to them. Therefore I had to prove and convince them of the truthfulness and importance of the ideas I was teaching. Even more essential to my mission was that I wanted these professionals to "own" this new knowledge. I did not want them to recite and learn by heart these pain management principles. I wished for them to integrate and truly reflect on what was taught. Was I being blindly naïve to think this was possible…? I consoled myself by thinking that if I had reached one person during this time, my mission was successful!

Cambodian children I met throughout my mission

Innovative 'IV poles' at the National Pediatric Hospital in Phnom Penh

Medication delivery

It struck me to see how hospitals lacked basic medications and materials. Within our two groups of students, only 21% were using oral morphine for pain control, compared to 100% for paracetamol (or acetaminophen) and 70% for aspirin (ASA). The major obstacle to the use of morphine was a drug shortage in hospitals as many of them did not even have it in-house. Lack of knowledge is another obstacle as many misconceptions about its use in children still persist. Although morphine is available in Cambodia, it is expensive. Nevertheless, if patients can afford paying for this medication they can easily buy it from a pharmacy as no prescriptions are needed to buy any medication, even narcotics. Additionally, pharmacies are often not managed and owned by licensed pharmacists leading to major problems of polypharmacy selling and auto-administered medications without having the proper knowledge to do so. It is not unusual to encounter patients taking three anti-inflammatory drugs for pain relief.

Final thoughts

Throughout my two weeks of teaching in Cambodia I learned and observed many things about the cultural differences and its affect on pain management. The acknowledgement of pain assessment and treatment not only depend on the people but also on the resources made available to them. These can come from many sources like materials, medications (safe and low cost), easily accessible knowledge (via books, journals, Internet), policies and guidelines, among others. We need to work together in helping these less privileged countries like Cambodia by increasing these resources and spreading our "pain knowledge wealth".

During my mission, I planted a seed - the starting point to an increased awareness and willingness to improve pain management in children. I wish to return later this year with the hope of witnessing the blooming of this seed. But as we all know, knowledge transfer into practice is quite complex as it requires countless reminders and reinforcement. Something that is very difficult to achieve even in the best of conditions. Nevertheless, I did feel I was getting through to some of the participants as they genuinely thanked me for an excellent teaching session. But the greatest acknowledgement I received was when, one week after the end of the seminar, the director of the emergency and resuscitation unit informed me that he had just started to work on a pain management protocol. Talk about ending on a fine note!

Participants of the teaching session familiarizing themselves with a pain scale

Patients and families waiting in entrance of
The National Pediatric Hospital in Phnom Penh

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