

Running Head: KANGAROO CARE ANALGESIC

KANGAROO CARE AS ANALGESIC FOR PRETERM  
INFANTS UNDERGOING HEEL STICKS

By

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A Thesis Submitted to the Honors College

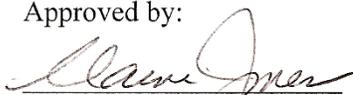
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### Abstract

More than half a million infants are born preterm each year in the United States. Preterm infants often undergo many painful procedures starting minutes after birth. A preterm infant may have as many as 10 painful procedures in a 24 hour period. The experience of pain leads to negative physiological responses, creating additional risks for the preterm infants' immediate and long-term health. Research demonstrates that infants are often undertreated for pain. Kangaroo care is a promising, non-pharmacologic analgesic, implemented as skin-to-skin contact between the infant and a caregiver. The purpose of this paper is to review relevant research about the use of kangaroo care as pain management for preterm infants, and to present a proposal for implementing and evaluating a best practice protocol for kangaroo care as an analgesic in a neonatal intensive care unit.

### Kangaroo Care: Treating Pain in Preterm Infants

In 2006, more than 500,000 infants, 13% of all infants, were born preterm in the United States (Martin et al., 2009). Each year, the rate of preterm births increases (Martin et al.). Since 1990, the rate for preterm births has increased 20% (Martin et al.). Newborns are considered preterm when they are born before 36 weeks gestation. Infants born before 36 weeks have not had enough time to develop in utero and need medical care to support a successful transition from birth to life. The development of new technologies, treatments, and the neonatal intensive care unit [NICU] has dramatically increased life expectancy and life quality for these fragile patients.

Many of the life-saving new treatments and procedures are unfortunately painful and uncomfortable. Great effort has been made to reduce pain for preterm infants, which includes the administration of analgesic medications and non-pharmacologic methods. Safety and efficacy for analgesic medications for preterm infants has been established for only a handful of drugs. This makes it difficult to provide preterm infants with sufficient pain control for the numerous medical procedures they must endure (American Academy of Pediatrics [AAP], 2000). Carbajal et al. (2008) estimated that infants in the NICU undergo approximately 16 procedures each day; 10 of which are painful. It was also discovered that infants were given analgesic medication before 20% of painful procedures (Carbajal, et al.). Effective pain management is an ethical imperative, but it is also important because pain has harmful effects on preterm infants (Fitzgerald & Beggs, 2001).

Pain medications are difficult to develop, research, and safely administer to preterm infants. Therefore, alternative methods for controlling pain should be used whenever possible. Kangaroo care is a simple, non-pharmacological technique that has proven to have analgesic

benefits for infants. Kangaroo care is skin-to-skin contact between the infant's front and a caregiver's chest with the caregiver's hands holding the back of the infant and a blanket covering the infant (Ladewig, London, & Davidson, 2006). Kangaroo care is commonly practiced in NICUs because it has numerous beneficial effects for both infants and caregivers. However, kangaroo care is not yet being used specifically for its analgesic properties.

### Purpose

The purpose of this paper is to first review evidence for the use of kangaroo care as pain management for preterm infants cared for in the NICU and then to recommend a best practice protocol. After a brief introduction to the NICU environment, a theoretical foundation for pain management in preterm infants is explored. The next section discusses the current inadequacies in treating preterm infant pain and how this problem can be addressed. The following section reviews evidence that kangaroo care is an effective strategy for pain management during heel sticks for preterm infants. Next, a best practice protocol for kangaroo care analgesic for preterm infants undergoing heel sticks is proposed. After, the Diffusion of Innovation Theory is used to describe implementation of the proposed protocol. Finally, an evaluation of the protocol is presented which includes a hypothetical budget for implementation.

### The NICU Environment

The development of NICUs occurred in the early 1960's. The death of President John F. Kennedy's 34 week preterm son increased awareness about the high mortality of preterm infants (McGrath, 2002). This nationally acknowledged tragedy spurred research to improve outcomes for preterm infants. Now there are over 1,500 NICUs in the United States (McGrath). Technological advances, including the development of ventilators, surfactant medications,

surgical techniques, and continuous monitoring, have aided greatly to decrease mortalities among preterm infants.

The NICU, like all intensive care units in a hospital, are full of complicated machinery and are noisy, bright environments. This can be very stressful to families and causes sensory overload in infants. A strong focus on family centered care, which includes the family in making treatment decisions and providing care for their infant, has greatly improved patient outcomes and increased family satisfaction (McGrath, 2002; Power & Franck, 2008). Allowing parents to provide the healing benefits of kangaroo care has proven to increase confidence in parenting abilities, promotes attachment, and increases satisfaction with the NICU experience (Ludington-Hoe et al., 2008).

#### Theoretical Foundations for Pain Management

Despite the once commonly held belief that infants cannot feel pain, “preterm and term infants demonstrate similar or even exaggerated physiological and hormonal responses to pain compared with those observed in older children and adults” (AAP, 2000, p.455). Pain in a preterm infant is transmitted by different pathways and has more deleterious physical effects than in adults (Fitzgerald & Beggs, 2001). In adults, physical pain occurs when a stimulus transmits a signal along nerve fibers into the dorsal horn of the spine and into the brain (Carroll, 2005). In preterm infants, immature sensory processing leads to lower thresholds for excitation and sensitization, which maximizes central effects of tissue-damaging pain input signals (Fitzgerald & Beggs). Preterm infants also have pliable peripheral and central sensory connections which are more vulnerable to early damage, leading to prolonged structural and functional alterations in pain pathways (Fitzgerald & Beggs). Pain experienced in the neonatal

period results in sensory alterations that are present in childhood and could be permanent (Walker, Franck, Fitzgerald, Myles, Stocks & Marlow, 2008).

Pain in the preterm infant causes unstable changes in vital signs, glucose levels, decreases sleep, increases cortisol secretion, hinders the immune system, and increases crying (Ludington-Hoe, Hosseini, & Torowicz, 2005). Crying is dangerous for preterm infants for two reasons. One reason is that crying increases intracranial pressure, which increases the risk of intracranial hemorrhage. Crying also increases calorie expenditure, which delays infant weight gain, stunting growth development, and delays healing. The American Academy of Pediatrics (2000, p. 454) published the opinion that “Exposure to prolonged or severe pain may increase neonatal morbidity.” Pain also has long term harmful effects. According to Ludington-Hoe et al. (p. 376), “Pain in the neonatal period leads to long-term changes in the neural circuitry and behavior, exposing the preterm infant to either permanent suffering or abnormal somatization throughout life.” Infants subjected to numerous painful procedures develop hypersensitivities to pain that can last well into childhood (AAP; Fitzgerald & Beggs, 2001).

#### Current Problem with Pain Control

The issue of inadequate pain control needs to be addressed because preterm infants constitute a significant population who are unable to advocate for themselves. According to Stevens et al. (2008, p. 287), “due to infant’s vulnerable nature and their dependency on caregivers, their pain is intrinsically linked to the caregiver.” Therefore, it is the responsibility of caregivers to ensure that these patients are receiving necessary pain control. Appropriately treating pain in preterm infants can prevent long term consequences of altered pain perception and behavioral problems, but it can also help to avoid morbidity and mortality for this population (AAP, 2000). Carbajal et al. (2008) presented frightening statistics about the number of painful

procedures preterm infants undergo during a two week stay in the NICU, as well as the lack of analgesics administered for painful procedures. In this study, preterm infants received approximately 115 procedures during a 14 day period in the NICU; 75 of which were considered to be painful (Carbajal et al.). Infants were given analgesics for less than 34% of procedures (Carbajal et al.). Another study performed by Stevens et al. (2003) found that infants were subjected to 10 painful procedures a day in the NICU following the first 7 days of life and that 70-87% of these infants did not receive any analgesic. The study also found that infants at high risk for neurological impairment received the greatest number of painful procedures and were given the least amount of analgesic. Infants at risk for neurological impairment suffer the most destructive effects of pain.

The AAP (2000, p. 454) acknowledges that there is a “failure of health care professionals to recognize and treat pain aggressively in infancy and early childhood.” Pain is difficult to determine because infants are unable to report pain. According to Anand and Craig (1996), “behavioral and physiological indicators are accepted as proxies for self reporting” (as cited in Stevens et al., 2008, p.287). Yet, behavioral cues are not sufficient indicators of pain in preterm infants (Slater, Cantarella, Franck, Meek & Fitzgerald, 2008). The 2008 study by Stevens et al. demonstrates that nurse caregivers were able to accurately detect infant pain only a moderate amount of the time.

Pain control for surgery and other major invasive painful procedures has become standard in the NICU (AAP, 2007). This is not the case for routine painful procedures, for example nasal aspiration, gastric tube insertion, and heel sticks (Carbajal et al. 2008). The AAP (2007, p. 152) recognized “despite increased awareness by caregivers that neonates in the NICU frequently experience pain, effective pain relief for these routine procedures is often underused.”

The AAP (2000) suggests that pain should be prevented by administering prophylactic analgesics because it is often difficult to identify and adequately treat pain in infants. A poor understanding of efficacy of pharmacological analgesics in preterm infants is another cause for poor pain control. “Fear of adverse reactions and toxic effects often contribute to the inadequate use of analgesics” (AAP, p.454). It is also difficult to identify analgesics that are effective for a multiple types of procedures. For example, it has been demonstrated that topical anesthetic agents are effective for venous access needle sticks, but are ineffective for reducing heel stick pain (Carbajal et al., 2008). Pain control in preterm infants, despite its difficulties, must be improved.

#### Addressing the Problem

In the past two decades, great advances have been made toward effective pain management in preterm infants. The National Association of Neonatal Nurses [NANN] has adopted policy statements about the necessity to treat infant pain and have provided recommendations for practice (Coleman, Solarin, & Smith, 2002). The NANN Clinical Guidelines for infant pain management include seven major points which are:

1. Proper pain assessment education for nurses
2. Regular pain assessment and reassessment, use of proper analgesics to control and prevent pain
3. Use both pharmacological and non-pharmacological therapies to prevent or control pain
4. Collaborate pain control with health care team and family of infant
5. Proper documentation of pain and assessment
6. Proper appointment of pain control policies per hospital

7. Evaluation of pain control policies (Coleman et al, 2002, p. 124).

Alternatives to traditional analgesic medications are becoming increasingly popular.

Non-nutritive sucking on a pacifier with or without sucrose has been well established as having analgesic effects and is frequently used in NICUs for painful procedures (Lefrak et al., 2006).

Non-nutritive sucking and oral sucrose have many advantages, including high efficacy, low cost, low risk, and ease of administration. Non-nutritive sucking and sucrose have proven to be effective adjunct therapies when used in combination with other analgesic techniques (Lefrak et al.). The limiting factors of non-nutritive sucking and oral sucrose are that they cannot be used for infants who are intubated or have oral gastric tubes (Lefrak et al.). Other effective non-pharmacologic therapies must also be implemented for infants who are ineligible to receive non-nutritive sucking and oral sucrose.

Kangaroo care has increased in popularity and is now commonly performed in NICUs. Recent research has demonstrated that kangaroo care has an additional analgesic benefit. A strong presentation of the benefits, efficacy, and cost-effectiveness of kangaroo care as a form of non-pharmacologic analgesic is needed to transform research evidence into practice. Adopting the practice of kangaroo care for heel sticks for preterm infants to reduce pain as a NICU protocol will help to improve clinical outcomes.

#### Kangaroo Care as a Pain Management Intervention

Kangaroo care was developed in 1979 in Bogota, Colombia at the Maternal-Infant Institute by Dr. Hector Martinez Gomez and Dr. Edgar Rey Sanabria (Martinez, n.d). Infants were commonly born preterm and at a low birth weight. Facilities were overcrowded, equipment was scarce and outdated, and noscomial infections were rampant. Needless to say, the infant mortality rate was high. In an effort to improve outcomes, the kangaroo mother care experiment

began. The results overwhelmingly demonstrated that kangaroo care increased survival rates and also improved quality of life for the infant and family. Since its discovery, kangaroo care has spread to other third-world countries and is successfully implemented in developed countries as well (Bergman, 2005).

Kangaroo care has been proven beneficial for infants, 28 weeks gestation and older, and is supported as standard clinical practice for preterm infants (Ludington-Hoe, et al., 2008).

Kangaroo care not only increases the ability of preterm infants to maintain a stable physiologic state, but it also helps to promote attachment between infant and caregiver and improves parental confidence (Ludington-Hoe et al.). This is a great way to promote family centered care.

Kangaroo care, like all non-pharmacological analgesics, is a more favorable alternative to opioid analgesics because it does not carry the possibility of respiratory depression, bradycardia, hypotension, gastrointestinal disturbances and neurological alterations. It can also be used for infants who have NPO orders and cannot have non-nutritive sucking and oral sucrose analgesic. It also lasts longer than oral sucrose, which must be re-administered every few minutes.

Additionally, kangaroo care helps to reduce infections, despite close contact between the bare skin of the caregiver and the infant (Charpak, Ruiz-Pelaez, Figueroa, & Charpak, 1997; Conde-Agudelo, Diaz-Rossello & Belizan, 2007). One theory is that this is “due in part to enhanced stratum corneum barrier function when hydration increases and transepidermal water loss decreases” (Ludington-Hoe et al.). Stress increases the production of corticosteroids, decreasing the productions of lipids and intracellular lamellae, which weaken the stratum corneum. The stratum corneum is a barrier that prevents water loss and also blocks invading organisms (Fore-Pflinger, 2004).

Research results from numerous studies indicate that kangaroo care has positive effects for preterm infants undergoing painful procedures. When infants are held in kangaroo care while undergoing heel sticks, one of the most commonly performed painful procedures in the NICU, infants cry less, have more periods of deep sleep, show less facial grimace and other indicators of pain, and maintain stable oxygen saturation levels and heart rates (Ludington-Hoe et al., 2008). Kangaroo care functions as an analgesic by increasing opioid peptide secretion in infants (Ludington-Hoe, et al., 2005). According to Ludington-Hoe et al., (2005, p.382) “Non-noxious stimulation, such as stroking, skin-to-skin contact, massage and pleasant warm temperature cause a release in oxytocin that enhances the antinociceptive effects of treatments.”

Another benefit of kangaroo care as analgesic is its very low cost. Care for preterm infants is extremely expensive. It was reported that \$10 billion was spent on preterm infant care in 2003(Cuevas, Silver, Brooten, Youngblut, & Bobo, 2005). Additionally, lower gestational age infants require the most expensive care (Cuevas et al.). Cost containment is a very important consideration when implementing new protocols. NICUs are already using kangaroo care, which means that they have already purchased necessary supplies for providing kangaroo care which include: comfortable chairs, privacy curtains, front opening gowns, and blankets. Initiating a kangaroo care analgesic protocol would be very cost effective for NICUs because patients and families would receive additional benefits without increasing cost of care.

### Literature Review

Several studies have been performed to evaluate the effectiveness of kangaroo care as a form of non-pharmacological analgesic for preterm infants undergoing heel sticks in the NICU. Studies identify pain and discomfort in preterm infants by vital sign changes, facial expression, cry time, sleep-wake cycle, behavior, posturing, and the well-established preterm infant pain

profile [PIPP] scale (Johnston et al., 2003). In the following studies, preterm infants were held in kangaroo care for various amounts of time prior to and during the heel stick procedure, ranging from 15 minutes to 3 hours. Indicators for pain and stress were measured at various intervals before, during and after the procedure. Each study found that preterm infants demonstrated fewer indicators of pain when held in kangaroo care for a heel stick.

Castral, Warnock, Leite, Hass and Scochi (2008) conducted a study about kangaroo care as pain management which included 59 preterm infants born at 30 to 36 weeks gestation. The infants were randomly selected to be receive 15 minutes of kangaroo care prior to and during a heel stick procedure or be in the control group who remained in the incubator or crib for a heel stick. Cry time, heart rate, facial expression, and sleep-wake cycle were evaluated for each infant. The findings for this study supported the hypothesis that kangaroo care diminished pain of a heel stick. Infants in the control group cried 2.3 minutes longer than infants who received kangaroo care. It was found in the control group that there was a 4 beat per minute greater increase in heart rate and a slower return to baseline heart rate following the procedure. Facial expression was evaluated using the Neonatal Facial Coding System and revealed that the mean scores were higher for the control group, which indicates more pain. It was also found that only 21% of infants in the control group entered a sleep state following the procedure compared to 71% of infants who received kangaroo care.

Ludington-Hoe et al. (2005) conducted a study which included 24 preterm infants born before 37 weeks gestation. The infants served as their own controls for the study by undergoing two heel sticks: one heel stick was administered after the infant had been in kangaroo care for 3 hours and the other heel stick was performed after the infant had been placed in a warmer for 3 hours. The infants were randomly assigned as to which treatment group they would be in first.

Cry time, heart rate, respiratory rate, oxygen saturation, and behavioral state were measured before, during and after the heel stick. The study found that 92% of infants in the warmer group cried during the heel stick while only 62% of kangaroo held infants cried. Cry times for the control group was an average 41 seconds, compared to only 5 seconds for kangaroo care group. It was also found that heart rates were more stable when infants received kangaroo care. Heart rate acceleration was an average of 23 beats per minute for infants in the control group and an average acceleration of 13 beats per minute while in the kangaroo care group. The study also found that only 18% of infants were in a deep sleep state while in the warmer compared to 88% of infants in the kangaroo care group.

Johnston et al.'s (2003) study included 74 preterm neonates born between 32 and 36 weeks gestation. Again, the infants served as their own controls in the study by being in both the treatment and control groups. The infants were randomly assigned to either first be in the experimental group, which received 30 minutes of kangaroo care prior to and during a heel stick, or first be in the control group, where the infants were swaddled in a crib for 30 minutes prior to a heel stick. Pain for the heel stick was measured by using the Preterm Infant Pain Profile [PIPP]. This scale has a range of 0 to 21 with 0 indicating no pain. Points are awarded for each of the following categories: heart rate, oxygen saturation, facial actions, neurobehavioral state, sleep state and age. The results of this study were that at 60 and 90 seconds after the heel stick, PIPP score for infants who were in the control group had an average PIPP score of 12.5 and infants in the kangaroo care group had a score of 10.4, indicating that kangaroo care successfully diminished pain for infants receiving heel sticks.

A similar, cross-over trial study was performed by Johnston et al. (2008). In this study, 61 preterm infants born between 28 and 31 weeks gestation received two heel sticks; one after

being held in kangaroo care for 15 minutes and one while being swaddled in a blanket for 15 minutes. The infants were randomly assigned as to which group they would be in first, and thereby served as their own controls for this study. The PIPP scale was utilized to determine pain by a blinded analyzer. The results of the study showed that at 90 seconds after the heel stick, infants in the control group had an average PIPP score of 10.6 and infants who received kangaroo care for the procedure had a score of 8.8. This indicates that the infants in the control group experienced a higher level of pain. Oxygen desaturations and heart rate accelerations were also found to be more extreme in the control group.

### Gaps in Research

While the short-term effects of pain are well understood, more research needs to be performed to fill in gaps in knowledge about the long-term damage caused by pain experienced by preterm infants. Currently, research is showing that preterm infant pain can cause hyperanalgesia, and increased sensitivity to pain which can last into childhood (Fitzgerald & Beggs, 2001). Evidence is gathering that pain has other negative effects on behavior and development (AAP, 2007). More research is needed to fully determine if these hypotheses are correct as well as the maximum potential damage.

Another topic that requires additional research are the long term effects that kangaroo care has on development, behavior, school performance, physical health as well as potential adverse effects. At this point, no research indicates that there are any adverse effects or negative consequences associated with kangaroo care. Research should also be directed toward identifying if tolerance to the analgesic effects of kangaroo care can develop similar to how tolerance develops to pharmacologic analgesic medications and oral sucrose.

### Synthesis

Evidence from the literature review reveals that kangaroo care is an effective analgesic when used for a minimum of 15 minutes and for infants born as young as 28 weeks gestation. Duration is an important factor in the success of kangaroo care. It was suggested by Ludington-Hoe et al. (2005, p. 15), that kangaroo care “ideally lasts at least 65 minutes.” Therefore, it is recommended that kangaroo care should be administered for as long as possible, but is necessary to last at least 15 minutes before and 15 minutes after a heel stick to achieve analgesic effects. Kangaroo care did not have any reported adverse effects in the above studies and was effective for all subjects. Thus it is safe and effective to utilize kangaroo care as analgesic for preterm infants born between 28 and 36 weeks gestation.

An important point to address is that all of the infants in the above studies were not receiving ventilator support. Therefore, the safety and efficacy of kangaroo care specifically as analgesic for these infants is unknown. However, it should be noted that infants on ventilators can still receive kangaroo care (Ludington-Hoe et al., 2005).

One point of controversy with kangaroo care as analgesic is that infants may develop association with kangaroo care and pain. This is a potential problem because kangaroo care is a powerful tool in developing attachment between caregivers and infants (Ludington-Hoe et al., 2005). Arguments against this hypothesis are that not utilizing kangaroo care as analgesic will subject infants to the more harmful effects of pain. The proven benefits of kangaroo care as an analgesic outweigh the risks of a potential association of pain and kangaroo care. A method to prevent development of an association would be to initiate regular kangaroo care therapy sessions in addition to using kangaroo care as analgesic.

### Proposed Best Practice

Preventing and alleviating preterm infant pain is not only ethically imperative, but it also prevents negative physical effects and leads to better overall patient outcomes. A review of current research supports kangaroo care as an effective and safe non-pharmacologic analgesic for preterm infants receiving heel sticks. At this time, there is no research that indicates any adverse effects from kangaroo care. Providing 15 minutes of kangaroo care for infants born between 28 and 36 weeks gestation that are not on ventilators is recommended as a non-pharmacologic analgesic prior to performing a heel stick. Even though an infant is in kangaroo care, it should be expected that the infant will feel some pain. Therefore it is required for the infant to remain in kangaroo care for at least 15 minutes following the heel stick to continue to receive the calming, stabilizing and analgesic effects of kangaroo care.

#### *Protocol for Pain Management of Heel Sticks*

The following protocol has been formatted to resemble established protocols at University Medical Center in Tucson, Arizona.

#### Kangaroo Care Analgesic Protocol

Purpose: To minimize negative effects of pain caused by heel sticks for preterm infants.

1. Identification of Appropriate Infants:
  - 1.1. Infants must be preterm, born between 28 and 36 weeks gestation.
  - 1.2. Infants must not be on ventilators.
  - 1.3. Infants must need a heel stick procedure.
  - 1.4. Infants must be classified as a Level I or Level II patient.
  - 1.5. Nurses may initiate kangaroo care without a physician order.
2. Consent

- 2.1. Identify caregiver to provide kangaroo care
  - 2.1.1. The parent or legally appointed guardian of the infant must give consent to provide kangaroo care or consent for a different designated caregiver to provide kangaroo care. Oral consent is acceptable if the parent or legal guardian will be providing kangaroo care. Written consent must be signed by the legal guardian and placed in the chart if another individual beside the parent or legal guardian will be providing kangaroo care. Consent only needs to be obtained once for each infant for the duration of the admission and document in the patient's medical record.
3. Caregiver providing kangaroo care
  - 3.1. The kangaroo care provider must be physically able to quietly sit and hold the infant skin to skin for a minimum period of 30 minutes.
  - 3.2. The caregiver must consult nurse prior to initiating a kangaroo care session.
4. Hygiene: The kangaroo care provider must
  - 4.1. Be free of infection or illness
  - 4.2. Maintain personal hygiene and be free from odor
    - 4.2.1. Not wear perfume, cologne, aftershave, scented lotion and must use mild soap when bathing prior to performing kangaroo care.
  - 4.3. Wash hands thoroughly for 2 minutes prior to entering the unit, per NICU policy.
  - 4.4. Wear a shirt that opens to the front or be willing to change into a hospital gown that opens to the front.
    - 4.4.1. Additional cleaning of chest area is not necessary.
5. Education:
  - 5.1. The caregiver must receive teaching from the nurse before initiating kangaroo care.

- 5.2. Teaching should first discuss the benefits and risks of kangaroo care
    - 5.2.1. Benefits include: it allows the infant to sleep more, cry less, a stable heart rate, breathing rate and oxygen saturation, allows for bonding and attachment and it has analgesic effect.
    - 5.2.2. There are no known risks associated with kangaroo care. There may be potential that the infant may associate pain with kangaroo care if it is used only for analgesic. This can be prevented when kangaroo care is provided when it is not needed as analgesic.
  - 5.3. Instruct caregiver how to administer kangaroo care: The infant is naked except for a diaper and is placed against the bare chest of a caregiver. The caregiver's hands cover the infant's back and a blanket is placed over the back of the infant. The nurse will help assist in transferring the infant from the crib to the seated caregiver. Continual assessment and monitoring will be performed on the infant while he or she is being held in kangaroo care.
  - 5.4. NICU staff instructs the caregiver that kangaroo care must last for at least 30 minutes to achieve maximum analgesic benefit. If a heel stick is to be performed, it will occur 15 minutes after kangaroo care has been initiated. Kangaroo care must continue for at least 15 minutes following the procedure, but there is no maximum time that kangaroo care can be performed.
6. Heel stick
    - 6.1. After the infant has been transferred into kangaroo care, the nurse will evaluate the infant's tolerance of kangaroo care.

- 6.2. If the infant has successfully tolerated kangaroo care for 15 minutes, the nurse may perform the heel stick procedure.
- 6.3. Caregiver will be instructed that kangaroo care must continue for at least 15 more minutes to continue analgesic benefits.

## 7. Documentation

- 7.1. Documentation should include: consent provided for kangaroo care, relation of the caregiver to the infant, teaching, the duration of the session, any procedures and heel sticks performed while the infant was in kangaroo care and evaluation of how the infant tolerated the procedure and kangaroo care.

### Implementing the Protocol

Millions of dollars are spent annually on research to improve patient outcomes. The final goal is then to apply research findings to clinical practice. However, altering or eliminating well-established routines and practices can be challenging as well as expensive. The Diffusion of Innovation Theory consists of five stages that describe how change can be successfully implemented in an organization (Rogers, 1995). The five stages, which are: knowledge, persuasion, decision, implementation and confirmation, will be explored in how they will be used to hypothetically implement the kangaroo care analgesic protocol at the University Medical Center in Tucson, Arizona.

#### *Knowledge*

The first stage of innovation occurs when the organization is “exposed to an innovation’s existence and gains some understanding of how it functions” (Rogers, 1995, p. 162). For the implementation of the Kangaroo Care Analgesic Protocol, staff in the NICU would first become aware of the need to develop better methods of controlling premature infant pain. The need to

improve infant pain control has been well publicized by the National Association of Neonatal Nurses (2002) and the American Academy of Pediatrics (2007). Nurses may also recognize the need to improve pain control as part of the ethical principal of non-maleficence; the practice of avoiding all unnecessary harm (Potter & Perry, 2005).

The next step in the knowledge process would be the information-seeking step where the organization attempts to understand the innovation and its advantages and disadvantages (Rogers, 1995). This occurs in three stages. First, in the *awareness* stage, information that the innovation exists is gathered (Rogers). In regard to the Kangaroo Care Analgesic Protocol, the organization attempting to develop supplementary pain control therapies will find research demonstrating the effectiveness of kangaroo care as an analgesic for heel sticks. The second stage, *how-to knowledge* is gathered about how to properly utilize and apply the innovation (Rogers). For the proposed protocol, examples of knowledge that would be gathered will include who is eligible for kangaroo care analgesic and how it should be performed. The third knowledge stage is the *principles-knowledge* stage where information regarding how the innovation works is explored (Rogers). In this stage, research about why kangaroo care has analgesic benefits will be investigated.

### *Persuasion*

After knowledge is gathered, a favorable or unfavorable opinion toward the innovation is formed. This is the persuasion stage (Rogers, 1995). Advantages, compatibility of the innovation with the organization and complexity of the innovation are evaluated by the decision-making unit. Various factors discovered in the knowledge gathering stage such as low cost, very low risk, and increased patient family satisfaction associated with kangaroo care analgesic may influence the organization to adopt a favorable attitude toward the innovation. Barriers involved

with implementing new protocols such as the cost and staff resistance could cause the organization to form a negative attitude toward the innovation. Discussion of the advantages and disadvantages of implementing new protocols often begin informally among staff on the unit. Informal clinical leaders play an important role by inspiring interest in implementing new evidence-based practices. Discussion of a new protocol may also be brought up at staff meetings. With sufficient interest in a new protocol, a unit-based Clinical Practice Committee will be formed to take the innovation closer to application.

### *Decision*

Either acceptance or rejection of the innovation is made during the decision stage. At the University Medical Center, unit-based Clinical Practice Committees are responsible for developing new protocols and putting them into practice (C. Nottingham RN, personal communication, April 1, 2010). The first step in the development of a new protocol is the creation of the protocol draft, supported with evidence, which is written by an individual on the unit-based Clinical Practice Committee. The protocol is then reviewed by clinical leaders and interested staff nurses who make up the unit-based Clinical Practice Committee. The proposed protocol is also reviewed by physicians, physician assistants, and nurse practitioners who practice on the unit who also evaluate the risks and benefits of the protocol. Following acceptance of the protocol by the unit-based Clinical Practice Committee and the advance practitioners, the protocol is presented to the Hospital Clinical Practice Committee. The Hospital Clinical Practice Committee is comprised of clinical unit leaders who deliberate to determine if a protocol is approved, in need of revision, or rejected. This process generally takes a few months (C. Nottingham RN, personal communication, April 1, 2010). The kangaroo care analgesic

protocol is specific only to patients in the NICU and therefore would be accepted as part of the unit-based protocols.

### *Implementation*

In this stage of innovation, changes are made as the new idea is put into practice (Rogers, 1995). The first part of implementation is providing the nurses who will be carrying out the protocol education about the new protocol. This will include information on the purpose, risks and benefits of the new procedure, who is an appropriate candidate for kangaroo care analgesic, how to get consents for the procedure, how to perform the procedures, how to correctly document the procedures, and who will be able to answer questions as they arise. Education may occur through several methods, including: email messages, memos, and posted fliers. Education for this protocol will also include a 20 minute in-service which can be provided to small groups of nurses during their shifts on the unit.

### Evaluation

#### *Confirmation*

The final stage of the Diffusion of Innovation Theory is the confirmation stage. During this stage, the organization seeks information to determine if it should to continue or discontinue the innovation (Rogers, 1995). This occurs by gathering data about the success or failure of the protocol. The evaluation process will occur after a prescribed period of time after the new protocol has been in place, for example three months. At this point, there has been adequate opportunity for a majority of the staff to have used the protocol with patients and it also allows the staff a chance to adapt to the change in routine and be able to provide a fair evaluation of the protocol. The short time period of three months will also allow for any major problems or issues

with the protocol to be addressed promptly. Evaluation of the protocol will be performed and analyzed by the same unit-based Clinical Practice Committee that developed the initial protocol.

Evaluation for this protocol will include four sections. The first section will be a scientific evaluation of the protocol. A simple study performed by one nurse employed by the unit will document evidence of infants effected by the new protocol and will analyze the data to show the effects of the protocol. The nurse collecting data will collect a series of PIPP scores for infants both while they are receiving kangaroo care analgesic for heel sticks and when they are receiving standard care for heel sticks, allowing them to serve as their own controls. PIPP scores will be taken prior to initiating kangaroo care, 15 minutes after being held in kangaroo care and immediately before the heel stick, immediately after the heel stick, and after another 15 minutes of kangaroo care. When infants are not in kangaroo care, the PIPP score will be taken before the heel stick, immediately after the heel stick, and 15 minutes after the heel stick. The Clinical Practice Committee should also examine documentation records for pain indicators. Analysis will include examining factors that are altered due to infant pain, and will include the number of bradycardia, apnea, and desaturation episodes, blood glucose results, infections, mortalities, and days of admission.

The next portion of the evaluation of the protocol will be an anonymous computerized survey completed by the nurses on the unit who are using the protocol. Please see appendix A for a sample survey that may be utilized for evaluation of the protocol. The third section of the evaluation will be a phone survey conducted with parents and legal guardians after discharge of infants who received kangaroo care analgesic. Phone surveys are conducted with patients and families of University Medical regarding care received on a regular basis and it will be feasible

to add an additional questionnaire regarding kangaroo care analgesic to the phone survey. Please see Appendix B for a sample phone survey.

The final section of the evaluation process will of course be a cost-benefit analysis of the protocol. Analysis will be performed to determine if there is a change, positive or negative in expenditure for the unit. Reasons for increase in expenditure could possibly include more overtime paid to nurses who have to spend longer teaching and assisting caregivers to perform kangaroo care. Causes for a decrease in expenditure could include a decrease in cost for treating infants who are suffering from the negative effects of pain which include unstable vital signs, unstable blood glucose, delayed healing time, infections and cerebral hemorrhage.

The following table summarizes each step of the Diffusion of Innovation process of implementing a new protocol at University Medical Center and includes a hypothetical budget.

Table 1

*Protocol Innovation and Budget*

Stage	Actions	Budget
Knowledge	<ul style="list-style-type: none"> <li>• Evidence is gathered supporting a change in protocol.</li> <li>• A unit-based Clinical Practice Committee is organized with the purpose of instituting a new protocol</li> <li>• A protocol is written</li> </ul>	No additional expenditures
Persuasion	<ul style="list-style-type: none"> <li>• The protocol is discussed and presented to nurses and advanced practitioners on the unit</li> <li>• The protocol is revised accordingly</li> <li>• Risks and benefits of the protocol are analyzed</li> </ul>	No additional expenditures
Decision	<ul style="list-style-type: none"> <li>• The revised protocol is presented to the Hospital Clinical Practice Committee for acceptance or denial</li> </ul>	No additional expenditures
Implementation	<ul style="list-style-type: none"> <li>• Nurses receive education about the new protocol and how to implement it</li> <li>• The new protocol is put into practice</li> </ul>	\$15 per nurse for one half hour of education for the new protocol
Confirmation	<ul style="list-style-type: none"> <li>• One RN performs PIPP score study</li> <li>• One RN analyzes pain indicator data (vital signs, blood glucose, exc.)</li> <li>• Computerize survey for nurses is conducted</li> <li>• Phone survey to parents is conducted</li> <li>• Cost-effectiveness analysis performed</li> <li>• Clinical Practice Committee decides if protocol is effective or should be discontinued</li> </ul>	\$1125 (\$25/hr for 50 hrs for nurse to collect and analyze PIPP data for 20 study subjects)  Otherwise, no additional expenditures

*Budget*

It will be relatively inexpensive to implement the Kangaroo Care Analgesic Protocol. There is no cost for the first three stages which include the formation of a unit-based Clinical Practice Committee, development of a protocol, and presentation of the protocol to the Hospital Clinical Practice Committee. These committees have already have an amount of money budgeted to them by the hospital for the purpose of developing new evidence based protocols.

The only costs to implement the new protocol are for education of the nurses. Kangaroo care is not a material that can be purchased and all the equipment necessary for kangaroo care is already paid for and being used by the unit. Educational in-service and materials such as memos and fliers will be provided by the unit-based Clinical Committee and will come from funds allocated to the committee. The budget will need to include approximately \$15 for one half hour total education time for each nurse on the unit to receive education.

The budget will also need to spend money for the evaluation of the protocol. The recommended PIPP score study will include at least 20 different patients. The nurse will to evaluate a total of six PIPP score series for each of the subjects: 3 heel sticks while receiving kangaroo care analgesic and 3 heel sticks while being swaddled. The nurse will spend a total of 20 minutes for each PIPP series collection, for a total time of 40 hours. Evaluation of the data will then take approximately 10 hours. The cost of the PIPP score data collection and evaluation will be \$25 an hour for 50 hours for a total of \$1125. Statistical analysis of pain data from patient documentation records can be performed by a computer program and the Director of Nursing Research employed by University Medical Center. Interpretation of results can be performed the unit-based Clinical Practice Committee to determine effectiveness of the protocol. A computerized survey is free and phone surveys are already included in the hospital budget.

### *Outcomes*

This protocol is directed at the most stable and soon-to-be discharged patients and therefore major changes in patient outcomes and financial status are not to be expected. Although patient outcomes may be measurably different, quality of care will definitely be improved. This will result in higher patient-family satisfaction. This is valuable to the hospital's reputation and can lead to an increase admission rates. It is to be expected that kangaroo care will not be initiated specifically for the purpose of analgesic; rather, heel sticks will be performed on infants who are already in kangaroo care. To ensure that this protocol is being practically implemented, nurses will be asked to encourage all families to provide kangaroo care as much as possible.

This protocol has been designed to cover only a limited number of patients and only one procedure to serve as a trial. If this protocol proves to have beneficial results, then more critical patients can participate in kangaroo care analgesic, and it can also be used for more procedures, such as nasogastric insertion, tape removal, and venipuncture. At this stage, more dramatic results will be evident in regard to improvement in patient outcomes and decrease in costs.

### Conclusions

#### *Limitations*

The major limitation with implementing this new protocol is the availability of caregivers who are able to perform kangaroo care. Parents, the primary kangaroo caregivers, often have obligations to work and other children and only have limited time that they are able to be present in the NICU. Parents are also often uncomfortable watching and being present while their child

is undergoing a painful procedure. Education for parents on the benefits of kangaroo care may help to increase the number of parents who participate in kangaroo care.

### *Summary*

The purpose of this paper was to provide a literature supporting kangaroo care as a method of analgesic, a recommended evidence based practice protocol, and suggestions for implementation and evaluation. With minimal financial expenditures, hospitals can easily update current practice to expand the role of kangaroo care to provide an additional benefit to patients. Hospitals will meet guidelines established by the American Academy of Pediatrics and nurses will meet ethical standards to reduce patients' pain. Using kangaroo care as analgesic is an easy, inexpensive, and risk free method for decreasing both short term and long term harmful effects of pain.

## References

- American Academy of Pediatrics (2000). Prevention and management of pain and stress in the neonate. *Pediatrics* 105(2) 454-461. Retrieved July 7, 2000 from <http://aappolicy.aappublications.org/cgi/content/full/pediatrics;105/2/454>
- American Academy of Pediatrics (2007). Prevention and management of pain in the neonate: An update. *Advances in Neonatal Care* 7(3) 151-160. Retrieved July 27, 2009 from CINAHL database.
- Bartocci, M., Bergqvist, L., Lagercrantz, H., & Anand, K. (2006). Pain activates cortical areas in the preterm newborn brain. *Pain* 122(1-2) 109-117. Retrieved March 24, 2009 from MEDLINE database.
- Bergman, N. (2005). *What is KMC: Where it started*. Retrieved January 21, 2010 from <http://www.kangaroomothercare.com/whatis02.htm>.
- Carbajal, R., Rousset, A., Danan, C., Coquery, S., Nolent, P., Ducrocq, S., et al. (2008). Epidemiology and treatment of painful procedures in neonates in intensive care units. *JAMA: Journal of the American Medical Association*, 300(1), 60-70. Retrieved April 14, 2009, from CINAHL database.
- Carroll, R. (2005). Anatomy and physiology review: Arousal, pain and conscious awareness. In Black, J., & Hawks, J. (8<sup>th</sup> ed.), *Medical-surgical nursing: Clinical management for positive outcomes* (pp. 344-350). St. Louis, MO: Saunders Elsevier.

- Castral, T., Warnock, F., Leite, A., Haas, V., & Scochi, C. (2008). The effects of skin-to-skin contact during acute pain in preterm newborns. *European Journal of Pain*, 12(4), 464-471. Retrieved March 20, 2009, from CINAHL database.
- Charpak, N., Ruiz-Pelaez, J., Figueroa, Z., & Charpak, Y. (1997). Kangaroo mother versus traditional care for newborn infants < 2000 grams: A randomized, controlled trial. *Pediatrics*, 100(4) 682-688. Retrieved March 25, 2010 from <http://pediatrics.aappublications.org/cgi/content/full/100/4/682?ijkey=11N88yRbIZKAM>.
- Coleman, M., Solarin, K., & Smith, C. (2002). Assessment and management of pain and distress in the neonate. *Advances in Neonatal Care* 2(3) 123-139. Retrieved July 28, 2009 from CINHAI database.
- Conde-Agudelo, A., Diaz-Rossello, J., & Belizan, J. (2007). Kangaroo mother care to reduce morbidity and mortality in low birthweight infants (review). *The Cochran Library*, (4) 1-38. Retrieved March 25, 2010 from <http://www.nichd.nih.gov/cochrane/Conde-Agudelo/CONDE-AGUDELO.HTM>.
- Cuevas, K., Silver, D., Brooten, D., Youngblut, J., & Bobo, C. (2005). The cost of prematurity: Hospital charges at birth, and frequency of rehospitalizations and acute care visits over the first year of life. *American Journal of Nursing* 105, 56-64. Retrieved January 1, 2010 from PubMed database.
- Fitzgerald, M. & Beggs, S. (2001). The neurobiology of pain: Developmental aspects. *Neuroscientist* 7(3), 246-257. Retrieved March 29, 2009, from CINAHL database.
- Fore-Pfliger, J. (2004). The epidermal skin barrier: Implications for the wound care practitioner, part II. *Advances in Skin & Wound Care*. Retrieved May 1, 2010 from [http://findarticles.com/p/articles/mi\\_qa3977/is\\_200411/ai\\_n9466451/](http://findarticles.com/p/articles/mi_qa3977/is_200411/ai_n9466451/)

- Johnston, C., Filion, F., Campbell-Yeo, M., Coulet, C., Bell, L., McNaughton, K., et al. (2008). Kangaroo mother care diminishes pain from heel lance in very preterm neonates: a crossover trial. *Neonatal Intensive Care*, 21(5), 36-42. Retrieved March 20, 2009, from CINAHL database.
- Johnston, C., Stevens, B., Pinelli, J., Gibbins, S., Filion, F., Jack, A., et al. (2003). Kangaroo care is effective in diminishing pain response in preterm neonates. *Archives of Pediatrics & Adolescent Medicine*, 157(11), 1084-1088. Retrieved March 20, 2009, from CINAHL database.
- Ladewig, P., London, M., & Davidson, M. (2006). *Contemporary maternal-newborn nursing care* (6<sup>th</sup> ed.). Upper Saddle River, NJ: Pearson Prentice Hall.
- Lefrak, L., Burch, K., Caravantes, R., Knoerlein, K., DeNolf, N., Duncan, J., et al. (2006). Sucrose analgesia: Identifying potentially better practices. *Pediatrics* 118(2), 197-202. Retrieved December 22, 2009 from CINAHL database.
- Ludington-Hoe, S., Hosseini, R., & Torowicz, D. (2005). Skin-to-skin contact (kangaroo care) analgesia for preterm infant heel stick. *AACN Clinical Issues: Advanced Practice in Acute & Critical Care*, 16(3), 373-387. Retrieved March 20, 2009, from CINAHL database.
- Ludington-Hoe, S., Morgan, K., & Abouelfettoh, A. (2008). A clinical guide for implementation of kangaroo care with preterm infants of 30 or more weeks' postmenstrual age. *Advances in Neonatal Care* 8(3), 3-23. Retrieved March 20, from CINHAl database.
- Martin, J., Hamilton, B., Sutton, P., Ventura, S., Menacker, F., Kimeyer, S. et al. (2009). Births: Final data for 2006. *National Vital Statistics and Reports* 57(7). Retrieved July 7, 2009 from Centers for Disease Control and Prevention.

- Martinez, H. (n.d.) *The mother kangaroo method*. Retrieved January 17, 2010 from [www.ideassonline.org](http://www.ideassonline.org)
- McGrath, J. (2002). "Neonatal Intensive Care Unit." *Macmillan encyclopedia of death and dying*. Retrieved August 25, 2009 from <http://www.encyclopedia.com/doc/1G2-3407200210.html>
- Potter, P., & Perry, A. (2005). *Fundamentals of nursing* (6<sup>th</sup> ed.). St. Louis, MO: Elsevier Mosby.
- Power, N. & Franck, L. (2008). Parent participation in the care of hospitalized children: A systematic review. *Journal of Advanced Nursing* 62(6), 622-641. Retrieved December 23, 2010 from PubMed database.
- Rogers, E. (1995). *Diffusion of innovations* (4<sup>th</sup> ed.). New York, NY: The Free Press.
- Slater, R., Cantarella, A., Franck, L., Meek, J., & Fitzgerald, M. (2008) How well do pain assessment tools reflect pain in infants? *PLoS Med* 5(6) 928-933. Retrieved December 23, 2009, from <http://www.plosmedicine.org/article/info:doi%2F10.1371%2Fjournal.pmed.0050129>
- Stevens, B., McGrath P., Dupuis, A., Gibbins, S., Beyene, J., Breau, L. et al. (2008). Indicators of pain in neonates at risk for neurological impairment. *Journal of Advanced Nursing* 65(2), 285-296. Retrieved December 23, 2009 from CINHAL database.
- Stevens, B., McGrath, P., Gibbins, S., Beyene, J., Breau, L, Camfield, C. et al. (2003). Procedural pain in newborns at risk for neurologic impairment. *Pain* 105(1-2), 27-35. Retrieved March 29, 2009 from MEDLINE database.
- Walker, S., Franck, L., Fitzgerald, M., Myles, J., Stocks, J., & Marlow, N. (2008). Long-term impact of neonatal intensive care and surgery on somatosensory perception in children

born extremely preterm. *Pain* 141(2009) 79-87. Retrieved December 23, 2009 from CINHAL database.

## Appendix A

### Sample Computer Survey for Nurses

1. How many times in an average shift do you perform heel sticks when you care for level I and level II patients?
  - a. 0-1
  - b. 2-4
  - c. 5-8
  - d. 8+
  
2. The following questions pertain to these methods of analgesic:
  - a. Swaddling and Containment
  - b. Holding, but not kangaroo care
  - c. Kangaroo Care
  - d. Sucrose
  - e. Medication (include continuous infusion)
  - f. None

Which method of analgesic do you use most often for heel sticks?

3. Which method do you feel is most effective form of analgesic?
4. What is the safest form of analgesic
5. Which method is easiest to use for heel stick?
6. What are reasons why you don't use analgesic?
  - a. Not physically possible. (I.e. infant is ventilated, NPO, in an isolette)

- b. Time
  - c. Method is unavailable. (I.e. No order for medication, no one to provide kangaroo care)
7. How often do you recommend parents participate in kangaroo care analgesic?
- a. Very often - I encourage all parents to kangaroo as much as possible
  - b. Sometimes – If parents seem interested and are frequent visitors, I recommend kangaroo care and kangaroo care analgesic
  - c. Rarely – I only offer kangaroo care analgesic if a parent requests kangaroo care
  - d. Never – I don't feel kangaroo care is effective for analgesic purposes
8. Do you feel kangaroo care is effective analgesic for heel sticks?
- a. Yes
  - b. No
9. Do you feel parents are receptive/enjoy participating in kangaroo care analgesic?
- a. Yes
  - b. No
10. Do you initiate kangaroo care specifically for analgesic purposes
- a. Yes
  - b. No
11. Do you use kangaroo care as analgesic if the infant is already in kangaroo care and it is the necessary time for the heel stick procedure?
- a. Yes
  - b. No
12. What suggestions do you have for improving the kangaroo care protocol?

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## Appendix B

### Discharge Phone Survey of Families

1. Did you have the opportunity to perform kangaroo care with your infant during their admission to the NICU?
2. How often and how much were you able to perform kangaroo care?
3. If you were not able to perform kangaroo care, what were the reasons why not?
4. Did a nurse or staff member offer to allow you to participate in kangaroo care or did you ask to perform kangaroo care?
5. Did you enjoy or were you glad you were able to perform kangaroo care?
6. What effect did being able to perform kangaroo care have upon your experience with the NICU?
7. Were heel sticks performed on your infant while in kangaroo care?
8. What effect did you feel the kangaroo care had on controlling your infant's pain?
9. Did you feel that you received adequate information about kangaroo care and benefits of kangaroo care analgesic?
10. Would you recommend kangaroo care and kangaroo care analgesic to other parents of preterm infants?
11. Would you recommend this NICU to others because of the kangaroo care opportunities?
12. What improvements would you suggest for this NICU's kangaroo care policies and procedures?