

# Stories of Children's Pain

Linking Evidence to Practice

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# Chapter 1

## Managing Neonatal Pain

### Lucas's and Lily's Stories

#### Lucas's story

I think one of the most difficult aspects of being a neonatal nurse is anticipating the behavioural cues of neonates to ensure that their needs are met. When babies are very immature it is difficult to interpret their cues and easy to forget that although the baby may not cry or show obvious signs of pain that they are still feeling pain from procedures we undertake. At our NHS Trust we have a Guideline for the Assessment and Management of Pain and Sedation in Neonates which acts as a clear reminder to us all about the importance of ensuring good pain relief prior to undertaking invasive procedures. For a baby requiring intensive care, assessment of pain should be undertaken hourly, however in critical situations I'm not always sure we remember as well as we should.

The little boy I was caring for, called Lucas, was ventilated on synchronised intermittent mandatory ventilation with pressures of 18/4 and a rate of 60bpm. He had a morphine infusion running at 20mcgs/kg/hour. Lucas started becoming agitated and there had been a slight drop in his oxygen saturations. I could also see some secretions in his ET tube so decided to undertake ET suction to clear the tube. This can be an uncomfortable procedure. As Lucas was already on a morphine infusion I asked his mother to utilise the 'containment technique' while I undertook the suction. His mum placed her hands gently but continuously over Lucas's head and legs to comfort him while I undertook the procedure. Containment has been shown to speed recovery from procedures with babies demonstrating less oxygen desaturations, lower heart rates and less behavioural cues demonstrating pain. I quickly undertook the suction and he recovered quickly. By undertaking containment his mum was able to undertake a vital care role for him and his stress and pain levels during the procedure were reduced.

#### Lily's story

This story involves the management of neonatal pain during the insertion of a chest drain by an Advanced Neonatal Nurse Practitioner (ANNP). The little girl called Lily was born at 24 weeks gestation and was 48 hours old when she developed a pneumothorax and required insertion of a chest drain. This is a very invasive procedure and is known to be very painful. I needed to ensure that Lily was kept as pain-free as possible during the procedure, and I didn't want to cause any undue stress that could impact on her condition further.

The Trust Guideline for the Assessment and Management of Pain and Sedation in Neonates asks us to consider if the procedure definitely needs to happen, could the

procedure wait until later, or could a less painful procedure be used. Due to the emergency nature of her condition the answer to all of these (except the first one) was no and it was essential that the chest drain was inserted straight away. The little girl was already receiving a morphine infusion as she was being ventilated. I discussed with the consultant neonatologist if Lily also required some local lignocaine around the insertion site or if a bolus of morphine to sedate Lily further would be more appropriate. We decided not to use the local lignocaine as the type of chest drains we use involve the insertion of a single needle as would an injection of lignocaine. So as she was ventilated I prescribed and gave a bolus of 100mcgs/kgs of morphine in addition to her maintenance morphine to increase her pain relief. I asked the staff nurse caring for her to perform containment to try to reduce her stress further using non-pharmacological methods. The insertion was undertaken as quickly as possible. As she was so premature it was very difficult to interpret her stress cues but I hope that Lily had adequate relief by using both pharmacological and non-pharmacological methods.

## Introduction

Both Lucas's and Lily's pain stories clearly demonstrate the daily challenge of meeting the needs of premature babies requiring intensive care. The nurses telling these stories demonstrated concern in minimising the level of pain experienced by the babies while they carried out essential procedures, not knowing if these vulnerable infants were actually experiencing pain or not. These stories articulate some of the complexities involved in managing neonatal pain.

This chapter will first explore the historical perspective that still influences the management of neonatal pain. This will be followed by an exploration of the amount of pain typically encountered by babies in neonatal intensive care units (NICUs) and the need for proactive pain management by nurses. A number of pain tools which have been designed for assessment of neonatal pain will be considered while acknowledging the challenges in identifying or recognising pain in very premature babies. Many essential painful procedures are undertaken with neonates, and require nurses to act to minimise their negative impact. Non-pharmacological methods of pain relief as outlined in the two stories will be explored as well as the part parents can play in helping to manage their babies' pain, followed by a focus on what pain management guidelines are available to assist nurses and parents in this particularly challenging area of pain management.

## Neonatal pain in context

Babies often experience high levels of pain in NICU. One study suggests that premature babies experience 100–150 painful procedures in the first week of life (Herrington 2007). Most of these procedures are considered to be minor, such as a heel prick, the insertion of an intravenous cannula or suctioning. However, cumulatively

these minor painful procedures make up the largest part of painful exposure for premature babies. Stevens et al. (2003) reported that neonates underwent more than 10 painful procedures a day, with those at highest risk receiving more painful procedures and being administered the least amount of analgesia during the first days of life. This is exemplified in Lily's story, where a very premature baby, two days old, required a painful life-saving procedure.

Every year in England and Wales one in eight babies is born prematurely. In the United States the incidence is also one in eight or 540,000 babies annually (March of Dimes 2011). It is known that the rate of premature births is rising (WHO 2012) and with improved technology and advances in neonatology very premature babies are surviving. These very premature babies require intensive care involving both very close monitoring and repeated procedural interventions which are essential for their survival. However, these repeated unavoidable painful procedures produce significant painful cortical responses (Slater et al. 2006), and pose a real challenge for neonatal nurses to recognise and respond to effectively. At the end of Lily's story the nurse expresses her concern for Lily and hopes she had adequate pain relief, suggesting that managing pain well in neonates is a real challenge for nurses, and may cause them anxiety and stress. However, the nature of their treatment means painful procedures are unavoidable.

Anand (2001), recognised as a pioneer in the research of infant pain, suggests that premature infants have the necessary neurotransmitters to transmit pain, but are poorly equipped physiologically to inhibit pain, leaving them hypersensitive to acute pain. This hypersensitivity to pain can lead, over time, to a lowering of their pain threshold and result in preterm babies interpreting ordinary non-painful stimulus, such as holding, as painful. The consequences also endure over time as demonstrated by a classic study conducted by Grunau et al. (1994) who compared the pain perceptions of two groups of toddlers: one group had extremely low birthweights and had experienced repeated painful procedures as neonates; the second group had received minimal painful procedures. At three years and four-and-a-half years the children in the extremely low birthweight group had significantly higher scores for pain hypersensitivity than the children in the full-term group.

### **The effect of the cumulative pain experience in NICU**

There is something quite unique in relation to the topic of pain in neonates. This group of babies are incredibly vulnerable to the experience of pain due to their immaturity and yet it is their very immaturity that demands the need for intensive care for their survival. However, intensive care of this nature includes life-saving procedures that are often very painful, a good example of which is Lily's story of needing a chest drain. It is necessary to consider the consequences of this high incidence of pain on this vulnerable group.

The newborn period is a time of rapid brain development and therefore makes premature babies very vulnerable (Kostovic and Judas 2010). Despite this recognition however, it is not yet fully understood what effect early pain-related stress has on the

newborn neurologically. Brummelte et al. (2012), in the only study of its kind to date, conducted brain scans on 86 babies born very prematurely (24–32 weeks), collecting detailed information on the number of painful procedures between scans. The results demonstrated effects on subcortical structures in the brain, suggesting that repeated early procedural pain may be linked with impaired brain development.

The time a premature baby spends in a Neonatal Intensive Care Unit (NICU) is critical for their overall growth and neurodevelopment. Therefore procedures carried out during this period may effect the neurological development of their early life (Fabrizi and Slater 2012).

Bouza (2009) suggests that preterm neonates are more vulnerable to stress and painful procedures and have heightened responses to successive stimuli. There is a need therefore for therapeutic interventions to provide comfort and analgesia for preterm babies. Bauer et al. (2004) studied the stress demonstrated by neonates in response to the experience of pain. They found an increase in oxygen consumption, energy expenditure and heart rate. Slater et al. (2012) found a significant relationship between procedural pain and oxidative stress in preterm neonates. It is clear that stress and increased energy expenditure are likely to have a negative impact on the babies' resources for cognitive and physiological development and maturity, with the result that the length of time in hospital is likely to be increased.

Longer-term consequences of pain have also been explored: Walker et al. (2009) performed quantitative sensory testing in 43 babies born extremely prematurely (recruited from the EPICure study, babies born at less than 26 weeks gestation in 1995) and found a generalised decreased sensitivity to all thermal modalities. They concluded that changes in neurological functioning can be detected many years after an extreme preterm birth. In Lucas's story the nurse described containment for a heel prick procedure. This is an example of a pain-minimising intervention for one of the most common painful procedures carried out in NICU.

Having considered the amount of pain neonates experience in NICU and the likely impact of that pain, there is a real need for pain to be effectively managed. This will be explored in the next section.

## Management of neonatal pain

Neonatal pain is often poorly managed and many painful procedures are carried out without any effort to relieve pain. A survey of neonatal pain management across the UK (Robins 2007) found varying standards of pain management of neonates. More than half of neonatal units did not have a protocol for pain relief, less than half administered analgesia before chest drain insertion and 75–80 per cent did not give analgesia before cannulation, heel pricks or venepuncture, despite evidence of simple effective measures such as the use of sucrose for pain relief for simple procedures (Kassab et al. 2012). The picture is one of a lack of priority given to dealing with or anticipating pain in many NICUs across the UK. A previous study by Rennix et al. (2004) found a similar picture with only 10 per cent of units giving analgesia

prior to heel sticks. In Lily's story the nurse recognises the potential for Lily to experience considerable pain. In response to this she considers a local anaesthetic but realises that providing this would mean two painful procedures for the baby rather than one. She therefore opts for a bolus dose of morphine to provide sedation during the painful procedure. This story demonstrates the sort of dilemma neonatal nurses are often faced with, and the need to be well informed in making strategic decisions about what route to take in dealing with neonatal pain.

A study in Norway (Andersen et al. 2007) involving 90 clinical staff in two NICUs found that although the majority rated most of the listed procedures as moderately painful for neonates, analgesics were rarely used. This finding led the authors to conclude that neonatal pain is not sufficiently managed and analgesics as well as comfort measures are under-utilised.

It is worth considering here what the literature has to offer in relation to what influences nurses' pain management which may provide insight into why neonatal pain appears to be poorly managed. Nimbalkar et al. (2012), who surveyed nurses in relation to their knowledge of neonatal pain across a paediatric department, found that nurses' lack of knowledge and their attitudes were hindering pain management. Nurses identified doctors not prescribing analgesics as a barrier to managing neonatal pain. These findings are supported by a study by Latimer et al. (2009) who found that the management of procedural pain for neonates was more likely to be evidence-based when there was higher nurse-doctor collaboration. Other positive influences were identified as caring for higher-intensity infants and where nurses had unexpected increases in work assignments. These findings could suggest that nurses who care for high-intensity infants were more likely to have a neonatal nursing qualification which gave them more confidence and therefore the ability to develop good working relationships with doctors as well as cope with the unpredictability in their role, such as unexpected increases in work assignments.

Despite the wider picture from the literature being quite negative both Lucas's and Lily's stories demonstrate how nurses in NICU can, with some forethought, anticipate a baby's pain and plan to prevent or at least minimise it.

## **Pain assessment**

So far it is clear that painful procedures in NICU are mostly unavoidable and occur in significant numbers with potentially quite detrimental effects for a baby. Nurses and other health care professionals need support to be able to recognise and respond to infant pain. A number of pain assessment tools have been developed to help nurses address the specific needs of neonates on pain. However, due to a baby's inability to self-report there is no recognised gold standard for infant pain assessment, unlike that which exists for older children (Warnock and Lander 2004). The alternative therefore involves physiological and behavioural indicators of pain, making assessing pain in newborns very challenging for nurses. In

Lily's story the nurse articulates her hope that the baby's pain was managed, indicating the difficulty in actually identifying pain cues in premature neonates. When using behavioural indicators, it is not always clear how to distinguish behaviours that indicate hunger, distress or actual pain. Stevens et al. (2007) suggest that although all infants demonstrate withdrawal behaviour in response to pain, the relative intensity and duration of responses are linked to the baby's gestational age and also how ill they are. Assessing pain in infants is challenging as many behavioural cues may indicate distress, but without self-report it is difficult to distinguish pain. Nurses are expected to be able to make the judgement as to whether the infant is in pain. Balda et al. (2000) suggest there is speculation that health professionals under-assess infant pain as a coping strategy when put in a position where the care they deliver necessitates inflicting pain. Such a strategy may be understandable, but inevitably leads to pain being ignored or overlooked.

A systematic review by Duhn and Medves (2004) on infant pain assessment tools found dozens of unidimensional, multidimensional and composite measures for assessing pain in infants. These various tools have a range of feasibility and clinical usefulness, however the number of tools available is also indicative of the lack of an available gold standard for infant pain measurement in response to hospitalisation.

Although infant pain tools are readily available, the uptake of any tool will depend on its acceptability to nurses and its usefulness in determining pain. In a study by Schiller (1999) the clinical utility of PIPP (Stevens et al. 1996) and CRIES (Krechel and Bildner 1995) was evaluated; both tools were deemed clinically useful although CRIES took longer to complete, and PIPP was more acceptable to nurses.

Stevens et al. (2008), who developed PIPP, studied 149 neonates at risk of neurological impairment as a result of painful procedures carried out in neonatal intensive care units. They found that facial actions were rated by clinicians as the most important indicators of neonatal pain. Pain researchers, however, demonstrated a better understanding of the importance of pain indicators than nurses. The indicators identified with the highest accuracy for discriminating pain were brow bulge, eye squeeze, nasolabial furrow and total facial expression. These findings could suggest that nurses recognise the facial features indicating pain but do not necessarily act on them, or it could be that contextual factors in the NICU influence the decisions made by nurses in response to the recognition of pain cues. Perhaps nurses are sensitised to pain or influenced by competing demands such as speed or urgency for a medical painful procedure to be undertaken.

Hutchinson and Hall (2005) suggest that although there are validated pain tools for use with premature neonates, there are various challenges inherent in assessing neonatal pain: in NICU some babies receive paralysing medication while being ventilated. Such babies also undergo various painful procedures, however it is very

challenging for nurses to assess their level of pain due to the paralysing agents. Experience of staff can have a dual effect in that experienced staff are likely to have more finely tuned observational skills than less experienced staff, but they are also more likely to be able to carry out painful procedures such as venepuncture with more skill and in a shorter period of time, thereby diminishing the amount of pain experienced by the baby.

The lack of a gold standard for pain assessment has meant ongoing studies for indicators of neonatal pain. A new area under development is the study of biomarkers in relation to pain response in infants (Anand et al. 2007). Relevant biomarkers should be a meaningful signal that reflects the babies' pain system and their response to pain. An example of a readily available biomarker is salivary cortisol. The limitation of biomarkers, however, is their ability to be interpreted meaningfully in relation to infant pain, such as indicating the intensity of a pain sensation. While many biomarkers are available for use in neonatal pain responses, no single biomarker reflects all aspects of a baby's response to pain.

### Pain assessment tools

A range of validated pain assessment tools is now available, some of which will be explored here. Three categories of behaviours have been consistently identified in the evaluation of pain for all infants: facial expression, vocalisations and motor activity (Stevens et al. 1998).

The Premature Infant Pain Profile (PIPP) was developed by Stevens et al. (1996) and contains seven indicators. Stevens et al. (2007) studied the pain responses of 149 neonates and categorised the responses. The pain indicators identified were then classified into two main categories: physiological (e.g. gestational age, behavioural state, oxygen saturation, and heart rate) and behavioural (e.g. eye squeeze, nasolabial fold, brow bulge). The findings of the study support the use of PIPP in measuring pain in vulnerable infants. Another study using PIPP was carried out by Badr et al. (2010) on the pain responses of 72 preterm babies to a heel stick procedure, scoring their pain on the Preterm Infant Pain Profile (PIPP) scale. Pain scores were highest for the lowest gestational age group. They concluded that sick premature babies and those who have been exposed to many painful procedures may not demonstrate behavioural or physiological signs of pain, but may be the most likely to benefit from precise pain assessment and careful management. In Lily's story her nurse articulates that the baby's prematurity makes it difficult to interpret her pain cues.

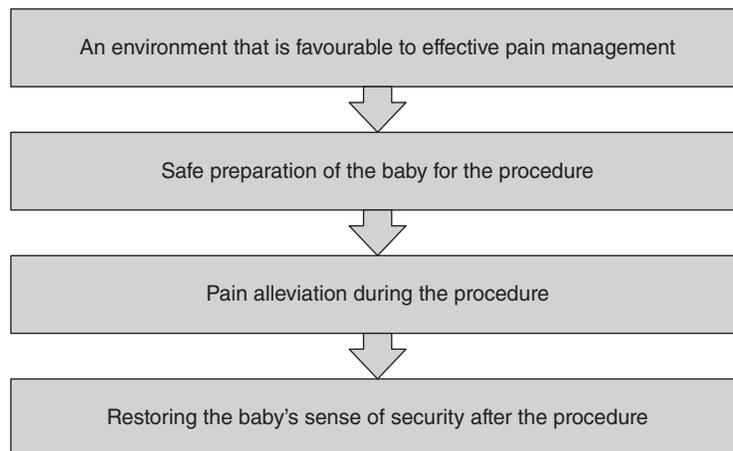
The COMFORT scale has also been adapted for the measurement of pain in premature infants with a gestational age of between 28 and 37 weeks (Caljouw et al. 2007) in the Netherlands. It was found that a combination of the Visual Analogue Scale (VAS) and the adapted COMFORT scale allowed nurses to judge the clinical presence of pain in premature infants.

With such an array of tools, nurses need to be able to discriminate between them as to their usefulness. Spasojevic and Breugun-Doronjski (2011) evaluated the usefulness of four neonatal tools in describing an infant's pain in a clinical setting. The four tools were the Neonatal Infant Pain Scale (NIPS), the Douleur Aigue du Nouveau-ne (DAN), the Neonatal Pain Assessment Scale (NPAS) and the Premature Infant Pain Profile (PIPP). Although PIPP was found to be the most precise pain scale, one shortcoming of PIPP was the need to make a judgement on facial expression, which cannot be easily achieved in ventilated babies or where there is not a clear view of the baby's face.

In response to the need to have a neonatal tool that did not require an assessment of facial expression, Milesi et al. (2010) devised the Faceless Acute Neonatal Pain Scale (FANS), which does not depend on facial expression. FANS relies on an assessment of limb movement, cry and autonomic reaction. A validation study has found this tool to be reliable for use in preterm newborns when facial expression is not accessible (Milesi et al. 2010).

Pain tools are variously designed to determine if a baby has pain and, in some tools, the amount of pain. However, none of the tools differentiate between different causes of pain or actually identify where in the body the pain is located. Due to these and many other limitations of pain assessment tools, nurses need to be holistic in their approach to managing premature babies' pain.

Halimaa (2003) suggests that procedural pain management in preterm babies is a process involving four stages (see Figure 1.1).



**Figure 1.1 Four stages of procedural pain management**

Source: Halimaa 2003

Systematic pain management also requires documentation of the whole pain management process.

Having considered tools that may be used to assess a baby's pain, the next section will consider pain-relieving interventions to use with neonates and the involvement of parents.

## **Pain-relieving interventions and the role of parents**

In both Lucas's and Lily's stories the nurses utilised non-pharmacological methods of pain relief which have been found to have a positive impact on infant pain. Nurses are ideally placed not only to utilise such methods but also to promote the use of them to parents to enable them to contribute to the management of their baby's pain.

In the stories of Lucas and Lily, nurses used containment as a pain-relieving intervention. Containment involves restricting premature babies' reflex movements by holding them so that their arms and legs are near their trunk and maintain a flexed *in-utero* position. Containment can increase a neonate's feeling of security and calm agitated babies (Velasco-Whetsell et al. 1992). It has been found in the past to effectively reduce premature babies' pain responses and is adopted as a nursing standard of care in pain management (Corff et al. 1995; Liang et al. 2000). Of other effective non-pharmacological methods used in pain management, swaddling has been found to have a similar effect to containment (Neu and Browne 1997). Leslie and Marlow (2006) suggest that simple non-pharmacological methods such as the use of pacifiers, facilitated tucking and skin-to-skin contact can be effective in relieving neonatal pain. It is clear that parents can and should be encouraged to become involved in recognising, responding to and using non-pharmacological methods of pain relief to help manage their babies' pain.

In a study by Franck et al. (2004) involving 61 parents across nine neonatal units in the UK and US, it was found that parents reported that their infants had experienced moderate to severe pain, which was more than they had expected. Parents received information about pain and how to comfort their baby, but most of this information was verbal. Only 18 per cent of parents were shown signs of infant pain. The authors suggested that parents have unmet needs in relation to information regarding infant pain. It is clear that parents should be supported to become more involved in their babies' pain management. Parents have been found to be more accurate in their assessment of their infant's pain than health professionals (Pillai Riddell and Chambers 2007). However, parents in NICU require help in responding to their babies to help reduce or alleviate their pain. The difficulty in dealing with preterm babies is that their ability to communicate their pain or distress can be extremely limited due to their immaturity. Parents can be effective in helping health professionals recognise their babies' pain. By so doing they enhance the ability of the nurse to respond more readily and ultimately to reduce the long-term consequences of infant pain. Gale et al. (2004) interviewed parents and found that they wanted more information regarding their babies' pain and to be consulted on how they wanted to be involved in helping to manage pain. A developmentally sensitive approach to understanding the needs of both infants and parents is necessary (Pillai Riddell and Chambers 2007).

Parents have a key role to play when their infant undergoes a painful procedure (Curry et al. 2010), but parents need support themselves to be able to provide comfort for their baby. Parents should have the painful procedure and their role in providing

comfort explained. The nurse should assess the parents' level of anxiety as an overly anxious parent can inadvertently convey that anxiety to that baby. Axelin et al. (2010) found that mothers are willing to actively participate in their preterm babies' pain care. The involvement in care was found to be influenced by the mothers' experience prior to and during an NICU stay, suggesting that nurses need to assess mothers' preferences to be able to facilitate their involvement effectively. Parents have much to offer in helping to relieve their babies' pain: Johnston et al. (2003) suggest that the presence of parents and the use of touch promote physiological stability and a quiet state in infants. In both Lucas's and Lily's stories parents were included in managing their babies' pain, promoting evidence-based care. Including parents in managing their babies' pain also helps parents: Skene et al. (2011) conducted a study with 11 families that focused on the parents' involvement in their premature babies' pain management. Parents were observed and interviewed over ten months. It was found that including parents in comforting their babies when they undergo painful procedures helps them learn to parent.

Parents can also provide pain relief for babies in other ways. A study by Phillips et al. (2005) demonstrated that breastfeeding and maternal holding were effective pain-relieving strategies for babies undergoing heel prick procedures. An earlier study by Carbajal et al. (2003), of 180 newborn babies, found that breastfeeding during a procedure significantly reduced pain. Clifford et al. (2004) suggest that breastfeeding-induced analgesia appears to use a pain blockade composed of the components of taste, suckle and contact. Other strategies parents can use are consoling measures to manage injection pain and nurses should help parents to provide that support to their babies (Curry et al. 2010).

It would appear that there are many pain-relieving interventions that parents can utilise with the guidance and support of nurses. Being a parent of a premature baby in a NICU who is experiencing repeated painful procedures presents a number of potential obstacles to normal parenting. These include learning to parent their newborn baby, the transfer of responsibility for the baby from the nurse to the parent, and the establishment of attachment behaviour between the newborn baby and parent. A number of guidelines have been produced to guide nurses in dealing with the challenges of neonatal pain. These will be discussed in the next section.

## **Guidelines on the management of neonatal pain**

Anand (2001), who drew up a consensus statement for the prevention and management of pain in the newborn, suggests that practice should be geared to minimise or mitigate against pain. Pain should be anticipated because pain can occur every day and sometimes every hour. Physical aspects of the environment in which the premature baby is cared for, such as light and noise, can have an impact on pain perception and tolerance. Reduced light and noise can enhance physiological stability and therefore have the potential to reduce the babies' pain response.

Urso (2007) suggests that for the past two decades neonatal pain care has been an issue for health care. Now that protocols are being developed they need to be established in NICUs, because they promote assessment of pain, treatment, family involvement and education for caregivers. Guidelines for preventing or treating neonatal pain and its negative consequences include recognition of the sources of pain, routine assessment of pain, avoidance of recurrent painful stimuli, and the use of specific non-pharmacological and pharmacological interventions (Bouza 2009). In both Lucas's and Lily's stories the nurses demonstrated how they pre-empted their pain and consciously planned to reduce or alleviate the babies' pain in advance of the procedure.

A good source of guidance for pain management is provided by the APA (2012). In relation to neonatal pain it is recommended that sucrose or other sweet solutions can be used for procedural pain and non-pharmacological measures including tactile stimulation, breastfeeding, non-nutritive sucking, 'kangaroo care', and massage of the heel can be used for heel prick blood sampling. In Lucas's and Lily's stories, sucrose was not used but touch was in the form of containment.

## Conclusion

Lily's and Lucas's stories highlight the degree of pain that some neonates experience in NICU, as well as the regular challenge that nurses face in dealing with such pain. The cumulative effect of painful procedures can have a detrimental effect on neonates, in the short term by using up vital resources needed for growth, and in the longer term by sensitising them to painful procedures and distorting their perception of pain. The acceptance of the need for an accurate assessment of pain has led to a number of studies to develop validated pain assessment tools. Nurses now have a range of tools to use, but there is still a real challenge in reading the pain cues of very premature babies. The role parents play in dealing with their baby's pain has considerable potential but needs to be supported and guided by nurses. Nurses also need support to provide evidence-based care for premature babies whose survival involves regular, often life-saving, painful procedures.

## Key Points

- The rate of premature births is rising, meaning more very premature babies are requiring intensive care involving unavoidable painful procedures.
- Cumulative pain in the neonatal period can have long-lasting consequences.
- Analgesics and comfort measures have been found to be under-used with neonates experiencing painful procedures.
- There are a number of challenges for nurses in the use of validated neonatal pain assessment tools.
- Parents have a key role to play in the management of neonatal pain.
- Pain guidelines suggest that pain in neonates should be anticipated and comfort measures should be used to help relieve pain.

## Additional Resources and Reading

- You may want to learn more about neonates and neonatal care. Three resources are outlined here.
  - The EPICure study was the largest of its kind focusing on the long term consequences of being born premature. Costeloe K., Hennessy E., Gibson A.T., Marlow N. and Wilkinson A.R. (2000) 'The EPICure Study: outcomes to discharge from hospital for infants born at the threshold of viability', *Pediatrics*, 106 (4): 659–71.
  - The National Neonatal Audit Programme (NNAP) has been established with the aim of informing good clinical practice in aspects of neonatal care by auditing national standards: [www.rcpch.ac.uk/child-health/standards-care/clinical-audits/national-neonatal-audit-programme-nnap/national-neonatal](http://www.rcpch.ac.uk/child-health/standards-care/clinical-audits/national-neonatal-audit-programme-nnap/national-neonatal)
  - Bliss is the UK charity working to provide the best possible care and support for all premature and sick babies and their families: [www.bliss.org.uk/](http://www.bliss.org.uk/)

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