Knight, Emma (2010) An evaluation of Neonatal Pain Assessment. [Dissertation (University of Nottingham only)] (Unpublished)

Access from the University of Nottingham repository:
http://eprints.nottingham.ac.uk/23612/2/MAIN_BODY_part_2.pdf

Copyright and reuse:

The Nottingham ePrints service makes this work by students of the University of Nottingham available to university members under the following conditions.

This article is made available under the University of Nottingham End User licence and may be reused according to the conditions of the licence. For more details see:
http://eprints.nottingham.ac.uk/end_user_agreement.pdf

For more information, please contact eprints@nottingham.ac.uk
An evaluation of neonatal pain assessment

Chapter 1 - Introduction

This chapter introduces the population referred to as ‘neonates’, the notion and definition of pain and research surrounding the existence of pain in neonates. The importance of managing such pain in neonates and the role in which pain assessment plays in pain management is then introduced.

There were over 635,000 babies born in the United Kingdom in the year of 2006 (NAO, 2007), these babies are termed ‘neonates’ until 4 weeks of age (RCN, 2009). Between 2006-2007, over 63,000 neonates - approximately 1 in 10 required some sort of treatment in a neonatal unit (NAO, 2007). Neonates may be admitted to neonatal units for a number of reasons including; prematurity (defined as a neonate born before 37 weeks gestation (WHO, 1977 cited in Morris, 1995) – also referred to as a ‘preterm’ neonate); low birth weight; complications experienced during delivery, or; congenital abnormalities (Boxwell, 2006).

Babies that are admitted to a neonatal unit often require a number of procedures to be performed regularly as part of their treatment (Stevens & Franck, 2001; Harrison et al, 2002), some of these procedures are painful. An example of such a procedure is a heel-prick to obtain blood to test the neonates blood gases or blood glucose levels. Each of these heel-pricks causes direct tissue damage, the formation of which defines this as a painful event. The International Association for the Study of Pain’s (IASP) definition of pain being: ‘An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage’ (IASP, 1979).
In addition to pain from diagnostic or therapeutic procedures, pain may be caused by the underlying disease process or tissue injury (Coleman et al, 2002).

Reyes (2003) highlighted that the IASP’s definition problematic to relate to the neonatal setting, as neonates are unable to describe their ‘sensory and emotional experiences’. In order to overcome this, in 2001 the IASP amended the definition by adding that ‘the inability to communicate pain in no way negates the possibility that an individual is experiencing pain...’.

A slightly different definition of pain is offered by Anand and Craig (1999) who state that pain serves ‘...as a signalling system for tissue damage’. Gibbins et al (2003) highlight how ‘In all humans, pain elicits immediate physiological, behavioural and biochemical responses...’ which protects them from harm (pg 476). This ‘stress’ reaction involves activation of the nervous system often referred to as a ‘fight-or flight’ reaction. Schollin (2005) adds this fight or flight reaction is in nature protective but that in neonates, the short and long term effects of pain can be harmful. These potentially harmful effects will be discussed shortly.

Despite the existence of neonatology - the branch of medicine that concentrates on the care of the neonate and specializes in the diagnosis and treatment of the disorders of the newborn, (Mosby's Medical Dictionary, 2009) as a medical speciality since around 1955 (Philip, 2005), the acceptance that neonates can and do feel pain is relatively new.

A vast amount of research, surrounded by debate and controversy, has been required to alter historical beliefs in the medical world that neonates did not feel pain (Simons and Tibboel, 2006; McNair et al, 2004). Studies by Anand et al (cited in Van Dijk et al, 2004) in the 1980s were said to be ‘instrumental’ in
changing attitudes to pain in neonates. One such study (Anand, 1987) and a number of later research studies (Moore & Persaud, 1998; Avery, Fletcher & MacDonald, 1999) cited in Reyes (2003) suggest that a fetus, by 24 weeks possesses the necessary anatomical structures and functional ability to process pain.

As introduced above, although pain by definition is protective, prolonged exposure is harmful in that it can result in a number of physiological complications involving cardiovascular, metabolic and hormonal changes. These cardiovascular changes may include changes in heart rate, blood pressure, respiratory rate and intercranial pressure, all of which can be potentially be harmful (Anand & Scalzo, 2000). Mathew & Mathew (2003) state that such changes ‘...consumes energy and tissue stores that would otherwise be directed towards healing and growth’ (pg 110). Mathew & Mathew (2003) add that additional complications may include increased gastric acidity and decreases immunological function, both of which are unfavourable to the neonate.

In addition to these more short-term detrimental effects of pain, a vast amount of research exists highlighting the longer-term negative effects of pain. Studies have shown that altered pain processing and sensitivity; permanent central nervous system impairment; developmental delay, behavioural, social, emotional and stress disorders, and; poor cognition may be caused by exposure to pain in the neonatal period (Cignacco, 2007 and Grunau 2002 cited in Stretton 2009; Anand & Scalzo, 2000).

Anand (1990) suggests that the physiological changes caused by pain may result in altered brain structure. His research found that painful stimuli inflicted on a developing infant could permanently alter the cerebral anatomy. Grunau et al,

However, it is not solely the physiological effects of pain that prove detrimental to the neonate. Anand & Hickley, (1987) suggest that ‘Pain in the newborn and young infant is a source of stress for the infant, family and care provides’. Research by Macke (2001) suggests that pain experiences in newborns can affect emotional bonding with parents. Other research has shown alterations in sleep/wake status and feeding patterns have all been reported following a single painful event in the neonatal period (Marshall & Porter, 1982 cited in Stevens & Franck, 2001; Plotsky et al, 2000).

It has now been generally accepted that neonates can and do feel pain, and the latest research seeks to question whether neonates may actually feel more pain than older children and adults - especially those neonates who are preterm. The incomplete myelination of nerve cell axons in preterm neonates was used historically as a rationale into why preterm neonates did not feel pain. (The myelination of cell axons speeds up the transmission of nervous impulses). Although the myelination of axons are incomplete in preterm neonates, Anand, (1989 and 1990 cited in Duhn & Medves, 2004) suggested that the incomplete myelination resulting in slower transmission is offset by the shorter distances nervous impulses need to travel in the infant’s central nervous system. Anand, (1989 and 1990 cited in Duhn & Medves, 2004) also suggests that inhibitory neurotransmitters and inhibitory pain mechanisms are absent in preterm infants, thereby further increasing their sensitivity to pain.

In addition to this, Fitzgerald & McIntosh (1989) & Majcher & Means (1992) both cited in Mathew & Mathew (2003) found that neonates of all gestations have
possibly a higher concentration of substance P receptors (substance P transmits information about tissue damage from peripheral receptors to the central nervous system to be converted to the sensation of pain) which would increase sensitivity to pain.

Anand (2001) and Boyd (2003) believe that neonates do indeed feel more pain than older children and adults and because of this suggests that the ‘...measurement of pain must be considered as an important component of the healthcare provided to all neonates...’ (pg 122). Further evidence behind this belief is offered by Chiswick (2000) who found that the threshold for the reflex that causes the withdrawal of a limb to which pain is applied is lower in neonates than it is in adults. Chiswick (2000) continues that in neonates, this withdrawal reflex can be elicited by non-painful stimuli to the skin. He states that preterm neonates have less subcutaneous fat and because of this mechanoreceptors (a sensory receptor found in the skin that is sensitive to a mechanical stimulus such as pressure (Collins English Dictionary, 2003) when stimulated during routine procedures involving touch in preterm neonates, produces the same response as a pain response. Similarly, thermoreceptors (nerve endings that are sensitive to heat or a rise in body temperature (Mosby’s Medical Dictionary, 2009) can be stimulated by a cold surface such as when a stethoscope or a x-ray board touch the infants skin. Chiswick (2000) also suggests that electromagnetic receptors (such as those in the eyes) when stimulated by light on the retina in a preterm infant, this again produces a pain response. Jorgenson (1999) suggests that this pain response is elicited because preterm neonates are unable to protect themselves from light, as their retinas do not constrict until 32 weeks. Research by Andrews & Fitzgerald (1994, cited in Chiswick, 2000) found that the threshold required to produce a pain response increased with increased postconceptional age in the situations above.
Pain control in neonates has been shown to minimise the chances of postoperative haemodynamic and metabolic complications resulting from the short-term effects of pain (Bueno, 2007). It can therefore be inferred that in doing so this will result in the alleviation of the longer-term harmful effects of pain.

However, because of their inability to verbally communicate their pain through the use of language ‘neonates depend on others to recognize, assess and manage their pain’ (Craig, 2002; Gibbins et al, 2003) to enable successful pain control. In the NICU (Neonatal Intensive Care Unit) environment, neonates rely on both health care professionals and their parents.

‘Babies ‘speak’ though their actions and reactions...It is the duty of a nurse to act as a patient’s advocate, especially so for the neonatal nurse, whose charges cannot speak of their sufferings...a cry can indicate a soiled nappy or something more stressful to the baby such as pain’ (Sparshott, 1995).

Stevens & Franck (2001) suggests the volume of evidence indicating that neonates do feel pain ‘...mandates health professionals to attend to the prevention, elimination, or at the very least, control of pain for infants’ (pg 538). Reyes (2003) adds ‘The bedside nurse is in a key position to evaluate infant pain and advocate for appropriate intervention’. The role of the nurse in advocating for the needs of the patient is part of the responsibilities of the nurse set out in the NMC (Nursing and Midwifery Council) code of conduct (NMC, 2009) which states that nurses must “...act as an advocate for those in your care, helping them to access relevant health...care information and support.”

Gallo (2003) states that ‘Integrating comfort measures in daily patient care is inherent in the compassionate, caring profession of nursing, especially in the
neonatal setting’. Stretton (2009) suggests that comforting interventions such as containment holding, kangaroo care (where parent and baby have skin-to-skin contact), giving sucrose (there is much research to support this), and breast milk should be implemented.

Simons and Macdonald (2004) suggest that ‘Inadequate recognition and treatment of procedural pain is neglect of the healthcare professional’s moral, legal and ethical obligations to ensure every child is relieved from pain and suffering’. Further so, in the United Kingdom, there is additional legislation and policies that set out the nurses’ responsibility with regards to providing pain management for patients. These policies are highlighted and discussed in the discussion chapter of this dissertation.

*The first step in providing pain control through good pain management must come through pain assessment.*

Assessment is the first stage in any nursing task according to several models of Nursing such as Roper, Logan & Tierney (1998) and Smith (1995) With regards to pain management of the neonate; assessment is the first stage (Gibbins et al, 2003; Schollin, 2003). Gibbins et al (2003) follows that ‘Pain management can only begin once accurate assessment and measurement is complete and ongoing assessment is considered’. Slater et al (2008) state that ‘Inadequate pain assessment in infants prevents the provision of effective analgesia to infants receiving intensive care’.

The assessment of pain in clinical practise focuses on ways to diagnose and predict the need for intervention, evaluate the efficiency of intervention and examine the impact of the intervention on outcome (Caljouw et al, 2007; Stevens & Franck, 2001). In order to do this, Reyes (2003) states that ‘the nurse must
know how to recognise pain’. Gibbins et al (2003) concur, highlighting the need to differentiate between pain and other non-pain behaviours.

The question of how this pain is best assessed is what this dissertation seeks to address. A discussion of the rationale behind this study is now presented.
1.2 - Rationale behind dissertation title and identification of questions leading to aims and objectives

The interest behind this study came from personal experience when the author, a student nurse, spent time working on a level III NICU – a neonatal unit providing routine care, special care, high dependency care and intensive care to newborn babies (DoH, 2005). This experience led the author to question whether pain assessment was optimal on the unit and how effective pain assessment was. From this experience, the author became interested in the area of pain assessment in neonatal care and the need for good pain assessment to allow for good pain management for the reasons discussed earlier in this chapter. The author felt that the responsibility of a nurse to act as an advocate for their patients as highlighted within the NMC code of conduct (NMC 2009) was particularly related to this issue, and if the pain assessment the author witnessed in practise was sub optimal, this study could provide recommendations to improve care for this group of patients in the future. This experience led the author to the aim of this dissertation, to evaluate neonatal pain assessment.

The author identified that the first step required in order to address this aim would be to identify what best practise in neonatal pain assessment is. The author decided to carry out a review of the literature surrounding pain assessment in neonates. Within this search, the author sought to identify the best way of assessing pain in nursing practise, and to identify how often pain assessment should be carried out.

After obtaining literature highlighting best practise in neonatal pain assessment, the author then sought to evaluate whether recommendations for best practise from the literature were being adhered to in practise.
This was done by examining research studies of how nurses assess neonatal pain in NICUs, as well as obtaining results from an audit of a local large teaching hospital in the midlands.

This dissertation seeks to contribute to nursing practice by evaluating current neonatal pain assessment practices and assessing whether or not it is adequate, or whether it is an area that requires improvement. It aims to be readable by nursing and other clinical staff within neonatal services to give an overview in how pain assessment in neonates is vital in ensuring good pain management, in order to avoid the potentially detrimental short and long term effects that pain can cause. It aims to make recommendations that can be implemented into clinical practice and to suggest areas for further research in this area.
1.3 - Aim and Objectives of this dissertation

**Aim**

To evaluate neonatal pain assessment.

**Objectives**

- Carry out a systematic search of the evidence surrounding neonatal pain assessment

- Critically review and analyse professional guidelines surrounding neonatal pain assessment – identify what they suggest as best practise in assessing pain, and identify how frequently they recommend pain assessment be carried out

- Critically review and evaluate the relevant evidence identified to examine how nurses assess neonatal pain in practise

- Evaluate whether or not pain assessment and its frequency is carried out by nurses is adequate and/or in agreement to that set out in best practise guidelines. If it is not, to explore why this may be

- To make recommendations for nursing practise to optimise pain assessment in neonatal care, and to discuss areas for future research in this area.
Chapter Summary

The notion of pain in neonates and the need to minimize pain in neonates has been introduced in this chapter. From the literature discussed above, the author, through reading the literature concludes that pain control in neonates is an important issue within nursing practise and that pain assessment is the first step in the process of good pain control.

Through critically reviewing the evidence surrounding neonatal pain assessment, this study seeks to evaluate neonatal pain assessment, both in theory and in modern day neonatal nursing practise.
Chapter 2 - BACKGROUND

Expression of pain in neonates

The physiological changes bought about by the stress response caused by pain have been briefly introduced in the previous chapter. There, it was deduced that these changes could be potentially harmful to the neonate. However, these changes can potentially be useful in that they can be acknowledged as ‘clues’ that the neonate is in pain (Ranger et al, 2007). These ‘clues’ include a number of the physiological responses introduced in the previous chapter as well as behavioural responses.

With regards to physiological clues, Coskun et al (2000) cited in Reyes (2003) found that painful experiences evoke a global response in the neonate involving changes in metabolism, cardiovascular instability, decreased perfusion, impaired respiratory status and altered immunity. Mathew & Mathew (2003) add that changes in mean airway pressure, muscle tone and intra-cranial pressure have also been identified. Johnston & Stevens (1990) suggests that this cardiovascular instability and impaired respiratory status result from the increase in metabolic rate and thus the increased oxygen requirement that a pain response requires.

All of the above changes can be measures in a clinical setting, although measurement is more feasible in some parameters than others. Measuring biochemical changes such as the release of cortisol during times of stress is not immediately feasible in the clinical setting. Hence in the assessment of pain, one needs to rely on physiological and behavioural changes (as stated by Mathew & Mathew, 2003) that can be measured.
Whilst heart rate, respiration rate and oxygen saturation can be measured non-invasively in the clinical setting, intra-cranial pressure and metabolic changes cannot, and because of this, these two parameters are omitted from this discussion. Mathew & Mathew (2003) suggests that there may be up to a 20% increase in the measurable parameters in responses to pain.

Jorgenson (1999) suggests that heart rate is the most reliable physiological parameter in the identification of acute pain, with an increase in heart rate showing increased signs of pain and/ or distress. However, Jogerson (1999) acknowledges that a decreased hear rate may occur in more compromised (unwell/ preterm) infants. Research by Anand & Hickey (1987), and Brown (1987) concur with these findings.

With regards to respiratory effort, Brown (1987) and Wolke (1987) cited in Sparshott (1995) state that hyperventilation can occur as a pain response, but again the contrary (a decrease in respiratory rate and possible apnoea) is more likely to occur in fragile (often preterm) infants. These contrary responses between robust and fragile infants occur, as suggested by Jorgenson (1999), because ‘...the pre-term and ill newborn withdraws or ‘shuts down’” (pg 350).

Other physiological changes suggested to be indicative of pain include palmar sweating, dilated pupils and changes in blood glucose levels (Johnston & Stevens, 1990). Jorgenson (1999) cites research, which suggests that this is because infants use glucose stores in response to negative and stressful situations (Anand, 1998). Palmar sweating would be difficult to measure in clinical practise, and changes in blood sugar unsuitable, as this would require an invasive heal prick, which would itself cause pain. However pupilary changes could be something more easily measured. But, for reasons introduced in the previous
chapter, this shining of the light on the retina would indeed cause pain in infants of less than 32 weeks gestation.

However, it is important to consider that ‘Changes in physiological indicators are questionable if they only measure pain as they are results of activation of the sympathetic nervous system...they might indicate global distress rather than pain’ (Jogerson, 1999). This is because ‘They [the changes associated with pain] are changes that are [also] observed in non-painful stimulus that makes them difficult to interpret as pain indicators alone’ (Jogerson, 1999). Harrison et al (2002) concur suggesting that ‘Physiological responses on their own are not a specific measure of pain’.

Fortunately, in addition to these physiological factors, a number of behavioural factors have been identified as potential pain ‘clues’. Research by Sparshott (1995) details a neonatal facial coding system and the specific facial changes that are deemed ‘pain expressions’. These expressions include squeezing the eyes shut, contracting the eyebrows, an open mouth, a taut/cupped tongue and nasolabial furrow. Stevens (1996) adds tightly closed eyes and a rigid or dished tongue are also characteristic of the neonatal ‘face of pain’.

Graunau & Craig (1987) state that facial expressions relating to pain have been studied in detail and have been cited as the most specific indicator of pain resulting from noxious stimuli (as do Stevens et al, 1996 and Van Dijk et al, 2004).

In addition to these changes in facial expression, Chiswick (2000) suggests two further behavioural markers used to identify pain in the neonate - the onset and duration of crying and flexor withdrawal of the limbs.
Although it has been acknowledged that infants' cries are viewed as signals of non-specific distress (Lester, 1985 cited in Fuller & Neu, 2001), studies (Fuller & Horli, 1986; 1988) have shown some acoustic differences between the pain cries and those prompted by hunger or other states. However, these differences are technical to measure and cannot feasibly be measured in the day-to-day clinical settings.

Other body movements that have been linked to the expression of pain include finger clenching, thrashing of the arms and legs, writhing, arching of the back and head banging. However, Harrison et al (2002) suggest that body movements are less specific than facial expression as a response to painful stimuli. Stevens et al (1996) add that further behavioural indicators of pain include sleeplessness and sudden state (level of wakefulness) changes.

However, like the variation in physiological responses between neonates of varying gestation, as highlighted by Schollin (2005) ‘Behavioural responses might differ with gestational age, postnatal age and pain experience’ (pg 1359). Jogerson (1999) states that ‘facial activity is supposed to increase with the gestational age of the neonate’ adding that studies have demonstrated that very preterm neonates have less facial expression at baseline and during painful events. Gibbins et al (2003) suggests the reason for this is due to ‘The hypothalamic, pituitary and adrenal responses to painful stimuli are less developed in preterm neonates and subsequent responses to pain are less organised and predictable’ (pg 476). Sparshott (1995) suggests that physiological changes are the only means to assess pain in the very preterm infant because, along with facile activity, s/he suggests they are too young to coordinate this and other behavioural responses.
As well as gestational age, researchers have found that modifying factors such as health status, developmental ability, chronic pain, environment, consolability, and medication may affect pain expression (Barrier et al, 1989 cited in Reyes 2003; Stevens et al, 1996; Buchholz et al, 1998). Jorgenson (1999) highlights that ‘Illness and pain cause many of the same physiological changes’ and Craig (2002) and Stevens & Franck (1995) suggest that contextual factors such as fatigue or hunger may result in the same physiological changes to those seen in pain response.

As well as gestational age, research has shown that pain responses differ according to the type of pain that the neonate is experiencing. These different ‘types’ of pain include acute (such as that experienced during a quick procedure such as a heel prick), post-operative and chronic. Grunau et al (1998) states that ‘Chronic, longer lasting, internally generated or post-operative pain has received little attention [in research]. It is possible that subtle signs of ongoing discomfort will be missed if only those face actions common to most infants during acute procedural pain are measured’.

These behavioural and physiological ‘clues’ discussed above are what create the basis for a number of pain assessment tools. The use of pain assessment tools in discussed in the discussion chapter of this dissertation.

Chapter Summary

This chapter has discussed how the physiological changes brought about as a result of pain can be used to identify the expression of pain in neonates. However, it has been discussed that these physiological changes do not solely occur as a pain response but as a result of the activation of the sympathetic nervous system. It has also been highlighted that these physiological changes
vary in neonates of differing gestations and also with regards to different ‘types’ of pain.
Chapter 3 – Methodology

The initial direction of this dissertation involved carrying out a systematic search to identify research examining how nurses assess pain in modern neonatal practise. The results of this searches found only very few studies examining this existed, and that most studies were poor quality with regards to their methodologies and contained large amount of variations between methodologies used and country in which the research took place. From this, the author concluded that these articles could not be used within a systematic review due to the poor quality of the evidence.

Because of this, the direction of this dissertation changed to one that evaluated professional guidelines as well as the results of an audit surrounding benchmarking in pain assessment from a local level III NICU. These results were then critiqued to see whether or not what was recommended in professional guidelines was carried out in practise and whether this practise was in accordance with the theory behind neonatal pain assessment.

Obtaining the theoretical evidence (research and guidelines) behind neonatal pain assessment - Sources searched

A number of search strategies were used to identify as much relevant information surrounding neonatal pain assessment as possible. This involved searching electronic databases, websites, and the reference lists from relevant resources identified.

Electronic databases are said to be a quick way of searching relevant literature within hundreds of thousands of journal articles quickly (Khan et al, 2003) making them a key tool in the search for literature. However, the fact that such
databases contain such a vast amount of literature does have its drawbacks, which are highlighted shortly. Khan et al (2003) stress the need to search a variety of databases due to there being no single database that covers all publications from all healthcare journals. The databases that the author identified as relevant to this study, and in turn searched, included: MEDLINE, EMBASE, CINAHL, OVID, and the Maternity and Infant Care Database. The search strategy used to find evidence relating to neonatal pain assessment from these databases is outline shortly.

Another strategy the author used to find relevant evidence is the websites and the constituent search engine of specific organisations. Due to the subject area of this dissertation, the websites of; the Department of Health (DoH), the National Institute for Clinical Excellence (NICE), the National Audit Office (NAO), the Royal College of Nursing (RCN), the British Association of Perinatal Medicine (BAPM), and the Nursing and Midwifery Council (NMC) were thought to be relevant and were therefore searched.

When relevant evidence was obtained, the reference lists of this evidence were searched to identify any further relevant articles. The benefit of searching reference lists from relevant literature identified is highlighted by Khan et al (2003).

**Electronic database search strategy**

Both the CRD (2008) and the CRAG (1996) suggests that the search terms (also known as keywords) used in a search of an electronic database should capture all studies of interest, whilst minimizing the retrieval of irrelevant documents. The CRD (2008) states that if the criteria are too narrowly defined there is a risk of missing potentially relevant studies and the reliability of the results may be
reduced. However if the criteria are too broad the review may contain too much information, making it difficult to compare and synthesize (Horwitz, 1995; Eysenck, 1994 cited in CRD, 2008).

Through carrying out the research for the introduction and background sections for this dissertation, the author identified a number of words to be used as keywords in the main search. This was done by trial and error - comparing keywords from articles obtained to the keywords used in initial searches. The keywords were modified over a number of searches until the author stopped reaching new articles. At this point it was rationalised that the search had been saturated.

The keywords used to capture the population of interest were: neonat*, infant, newborn

(The use of * indicates the use of Boolean logic, in which, words beginning with 'neonat' and finishing with a variety of endings, such as 'e', 'es', 'al', are included in the search result).

The keywords used to capture the intervention of interest were: ‘pain AND assessment’, OR ‘pain AND measurement’

The search results of the two searches were then combined. In order for a result to be relevant, it would need to contain at least one term from the population field and another from the intervention field.
Inclusion criteria of identified search results

The CRD (2008) suggests that the use of inclusion criteria ensures that the boundaries of the review question are clearly defined. They include criteria such as literature having to be published within a specific time frame, be in a specific language, and/or be publicised in a specific format.

Because the aim of this study was to evaluate neonatal pain assessment as it is in current practice, the publication date of the literature searched for was limited to the last 10 years. The inclusion criteria was set to include only studies published between November 1999 and November 2009.

Although the CRD (2008) recommends that all relevant research studies should be included no matter what language they are written in, in order to limit language bias, due to lack of time and no resources/ facilities for translation, the inclusion of studies not written in English was not possible in this dissertation. The CRD (2008) states that language bias arises because it has been shown that studies conducted in non-English speaking countries are more likely to be published if they have statistically significant results compared to those which do not provide statistically significant results. This may prove to be a limitation of the search strategy undertaken for this dissertation.

However, the place of research/ publication will not be a factor for exclusion of studies within this dissertation. However it is important to highlight that difference in cultures may impact on the transferability of its results to a UK setting.

The CRD (2008) suggests that ideally a review should aim to include all relevant studies whether or not they are papers in peer reviews journals, reports, book
chapters, conference abstracts, theses or is a study which is unpublished, in order to prevent publication bias. Song et al (2000) cited in CRD (2008), suggests that publication bias can arise, as the sole inclusion of published studies may overestimate the intervention effect. However, there are practical issues that limit the inclusion of all studies in this dissertation. Unpublished studies are harder to source and are more difficult to obtain than published studies (CRD, 2008). Because of time constraints, non-published studies were not sought for in this dissertation. This will form a limitation of the study.

The search strategy for the websites identified above, and in searching reference lists of relevant literature is self explanatory – the keywords identified above were used in the constituent search engines of each website, and looked for in the reference lists. With regards to the website search, an additional word, the search term ‘audit’ was added in a second search.
CHAPTER 4 - RESULTS

4.1 Results from electronic databases search

These can be found in appendix 1 (a and b) of this dissertation. This evidence can be found incorporated into the discussion section of this dissertation.

4.2 Results from website search

The National Institute for Clinical Excellence (NICE) was accessed [September 2009], and neonatal pain assessment was searched for in both the ‘guidance’ and the ‘evidence’ section of the website, however neither of these searches found any relevant results.

The Department of Health website (DoH) was searched using the search terms but this method found zero relevant results. However, after searching through the website by hand, two documents seemed as though they may be relevant. The first of these articles was ‘Neonatal intensive care services - report of the Department of Health Expert Working Group’ (DoH, 2005) – however, when this document was read, it contained nothing surrounding neonatal pain assessment – maybe from this it could be suggested that this is not a key issue in neonatal services. The second document Standard 6 of the Children’s, young people’s and maternity services National Service Framework (DoH, 2007), contained relevent information. This information is discussed in the Discussion chapter of this dissertation.
A search of the website for the ‘Centre for Reviews and Dissemination’ found no results. DARE, NHS EED and HTA, all databases of systematic reviews, contained no relevant reviews when searched.

The Royal College of Nursing (RCN) website initially found zero results when the search terms were inputted into the ‘search’ bar. But when searching the website by hand, relevant articles were found. These included pain guidelines published by the Royal College of Nursing (RCN, 2009) and links to ‘relevant resources’ from which the author found a relevant publication by the Association of Paediatric Anaesthetists (2008) - Guidelines for ‘Good Practice in postoperative and procedural pain’, and the Essence of Care consultation on pain. The Association of Paediatric Anaesthetists (2008) guidelines contained relevant information and are discussed shortly however there was no mention of pain assessment in neonates in the Essence of Care document.

The 2009 RCN guidelines were updated guidelines based on those published in 1999. Examining the 1999 guidelines led me to further guidance published by the Royal College of Paediatrics and Child Health (RCPCH, 2001), which are discussed shortly.

A search of the websites of both the British Association for Perinatal Medicine (BAPM), and the Nursing and Midwifery Council (NMC) found zero relevant results. However, an article within the BAPM website (BAPM, 2008) highlighted other organisations which may be beneficial to search. These were; the NHSE Neonatal Taskforce; the report NHS Next Stage - response to review by Lord Darzi; the RCN - Neonatal Nursing Summit, and the Department of Health Midwifery Steering Committee 2020. Upon searching each of these organizations however, no relevant results were found.
Upon searching the National Audit Office, two documents were found which were thought to be relevant, these were ‘Caring for vulnerable babies: The reorganisation of neonatal services in England’ (NOA, 2007) and ‘RAND Europe: The provision of Neonatal Services’ (NAO, 2007b). However, neither of these documents contained anything on pain assessment.
4.3 Results from reading through the reference lists of the articles above

This process led to the discovery of a number of relevant articles not found in the systematic search highlighted below:


It is possible to see that the vast majority of these articles were not found in the systematic search because they were not published within the last 10 years. However, there were two articles that were published within the dates set out within the inclusion criteria, and, that also contained the search terms set out in the criteria. These articles were Boyle et al, (2006) and Franck et al (2000). The fact that neither of these articles were obtained in the systematic search highlights the fact that this methodology has its limitations.
DISCUSSION

CHAPTER 5 – Professional Guidelines

UK guidelines on neonatal pain assessment

This chapter seeks to critically review and analyse professional guidelines surrounding neonatal pain assessment at national, regional and local level. It seeks to identify recommendations for best practise in assessing neonatal pain, and identify how frequently pain assessment is recommended to be carried out.

National guidelines

As discussed in the previous chapter, the search on the Department of Health Website revealed a number of policies relevant to pain management, although only one of these contained guidelines acknowledging the assessment of neonatal pain requiring a different assessment strategy to older children. Chapter 12 of Standard 6 of the National Service Framework (NSF) for Children, Young People and Maternity Services: Children and Young People who are ill (Department of Health (DoH), 2007) discusses pain management stating that ‘Children and young people have a right to appropriate prevention, assessment and control of their pain’. The framework suggests ‘In order to treat children's pain effectively, a thorough pain assessment is necessary...’ highlighting that particular attention needs to be given to babies as they cannot express their pain. The framework highlights the need to consider chronic pain in assessment and management.

The framework gives six standards (see bullet points below) to achieve in pain management. Because the framework encompass all children from neonates through to young people, each standard can only be related to neonatal care and assessment of pain to a varying degree. This is highlighted below.
The management of pain is a routine part of any treatment or procedure in all settings. Children and young people are involved as active partners in pain management.

Obviously neonates cannot be ‘active partners’ in pain management, however the suggestion that pain management is ‘...a routine part of any treatment or procedure in all settings’ would be applicable to neonatal care.

- Protocols are in place for the assessment, prevention and management of pain for children and young people in every relevant clinical area.
- Where procedures are planned and pain can be predicted, children are prepared through play and education, and plans are made for pain relief for use during the procedure.
- Children are helped to manage pain through the use of psychological therapies, including play, distraction, coping skills and cognitive-behavioural approaches.

With regards to neonatal care, this could involve the use of containment holding, kangaroo care and breastmilk as highlighted in chapter one.

- Children are offered adequate analgesia for more minor procedures such as blood sampling.

The use of sucrose in neonates is a relatively new but successful way of offering comfort.

- The effectiveness of children's pain management should be demonstrated by regular audit (DoH, 2007).
However, the framework does not give any indication of how pain should be assessed.

Guidelines published by the Royal College of Nursing titled ‘The recognition and assessment of acute pain in children’ (RCN, 2009) do offer recommendations of how pain should be assessed, suggesting the following, bullet pointed below:

- Be vigilant for any indication of pain, and anticipate pain in neonates and children at all times.

  The guidelines give examples of signs that may indicate pain, including; changes in the child’s behavior, appearance, activity level and/or vital signs. This coincides with the theory discussed in chapter one and two of this dissertation.

  - If pain is suspected or anticipated, a validated pain assessment tool should be used rather than relying on isolated indicators to assess pain.

However, the guidelines acknowledge that ‘No individual tool can be broadly recommended for pain assessment in all children and across all contexts’. Again, this reflects the theory discussed in chapters one and two of this dissertation – Research on pain assessment tools, is often specific to a type of pain and/or gestational age of neonate.

Pain assessment tools, and their use in practice will be discussed later.

- Assess, record, and re-evaluate pain at regular intervals; the frequency of assessment should be determined according to the individual needs of the child and setting.
These RCN (2009) guidelines are endorsed by a number of professional organisations including; the Association of Paediatric Anaesthetists; the British Pain Society; the Royal College of Paediatrics and Child Health and the Royal College of Anaesthetists Faculty of Pain Medicine.

In addition to this, The Royal College of Paediatrics and Child Health (RCPCH, 2001) have their own guidelines for good Practice on the ‘Recognition and Assessment of Acute Pain in Children’. These guidelines were derived from the guidelines published by the Royal College of Nursing (RCN, 1999) – these were the guidelines superseded by the 2009 updated version.

The RCPCH (2001) guidelines were created by independently reviewing the quality of the research behind the RCN’s recommendations in the 1999 guidelines. The level of evidence (derived from the US agency for Health Care Policy and Research, 1993) behind each of the recommendations of the 1999 RCN guidelines, endorsed by the RCPCH (2001) are shown below:

<table>
<thead>
<tr>
<th>Recommendation:</th>
<th>Level of evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Changes in children’s behaviour, appearance, activity level and vital signs may indicate the presence of pain</td>
<td>B</td>
</tr>
<tr>
<td>Use physiological measure (e.g. heart and respiratory rates) but only in addition to self report and behavioural measures to determine whether children are in pain</td>
<td>B</td>
</tr>
<tr>
<td>Children may display individualised specific reactions to pain (e.g. silent withdrawal, fighting behaviour, attempts at pain alleviation) and pain description varies with developmental age and previous experience. A pain history should therefore be obtained from each child and his/ her parents at admission to discover what words the child uses for pain (obviously with regards to neonates this point will not be relevant)</td>
<td>B</td>
</tr>
<tr>
<td>Pain assessment should include the use of a validated pain assessment tool that measure (at least) a child’s self report or child behaviour, and may also include parental and health professional assessment. The pain assessments should be documented in the child’s health records</td>
<td>A</td>
</tr>
<tr>
<td>Recognise that infants (including preterm infants) demonstrate measurable behavioural and physiological responses to pain</td>
<td>B</td>
</tr>
<tr>
<td>Behavioural and physiological measures are valid and reliable indicators of acute pain in infants (including preterm infants) and</td>
<td>A/B</td>
</tr>
</tbody>
</table>
infant pain scores exist that should be used when pain is anticipated or suspected

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational age, behavioural state and previous pain experience should be considered when assessing acute pain in term and preterm infants</td>
<td>B</td>
</tr>
<tr>
<td>Parents should be encouraged to contribute to the assessment of their child’s pain</td>
<td>B</td>
</tr>
<tr>
<td>Parents need adequate information to be able to contribute to the assessment of their child’s pain</td>
<td>B</td>
</tr>
<tr>
<td>Health professionals should be trained to recognise and assess pain</td>
<td>B</td>
</tr>
</tbody>
</table>

The author believes that these guidelines are more encompassing than the RCN (2009) guidelines – acknowledging that children may display different reactions to pain and that silent withdrawal may be one of these (this is sometimes found in neonates with chronic pain as highlighted in chapter two); the use of a pain history, and; taking into account gestational age (the reasons for this have again been explored in chapters one and two of this dissertation).

The Association of Paediatric Anaesthetists (2008) also have their own guidelines on neonatal pain assessment. They offer a number of recommendations, which (as well as those already mentioned in previous guidelines discussed) highlight the need to document, act upon, reassess and re-evaluate pain assessment to determine the effectiveness of interventions (citing research from Howard, 1996; Salantera et al, 1999; Finley et al, 2005).

Similarly to the RCPCH (2001) guidelines, the Association of Paediatric Anaesthetists (2008) guidelines suggests that parents and other carers should be given appropriate information about their child’s pain (citing Simons et al. 2001; Polkki et al. 2002), as well as emotional support and clarification of their role in alleviating their child’s pain (citing Polkki et al. 2002). The guidelines state that it is important that parents’ beliefs about their child’s pain are taken into consideration as their beliefs may impact their child’s care. In order to do this, the guidelines state that parents/carers need appropriate information, teaching
and confidence in the use of pain assessment tools if they are to be effective in assessing (and managing) their child’s pain (Breau et al. 2003; Voepel-Lewis et al. 2005, both cited in The Association of Paediatric Anaesthetists, 2008, pg 30). However, it is important to highlight that the evidence used behind these guidelines supporting the use of parents’ opinions on their child’s pain is based on research on older children.

However, like the NSF (2003) guidelines, these guidelines do not offer recommendations on exactly how to assess pain.

5.2 - Regional benchmarking guidelines on neonatal pain assessment

In the particular region where the author of this dissertation is a student nurse, the following regional benchmarking guidelines exist. These guidelines are bullet pointed below, and the evidence from which the recommendations arise is cited. The guidelines continue to discuss pain management, however, only the points relevant to pain assessment are highlighted here:

- Evidence based, references clinical guidelines are in place relating to neonatal pain assessment and management (RCPCH, 2001)
- Clinical guidelines are reviewed in line with Trust policy (Hutchinson & Hall, 2005)
- Incidents highlighting sub-optimal care regarding poor technical skills causing pain are reported using individual trusts clinical risk procedure
- Compliance with the guidance is audited according to Trust policy
- All staff are educated about the assessment and management of neonatal pain, including the use of an appropriate assessment tool and intervention strategies when required (Simons et al, 2001; Dodd, 2003; Clifford et al, 2004)
• Staff competence in the assessment and management of pain is assessed and documented (Henry et al, 2004)
• Up-to-date research-based information on the assessment and management of pain is available on the unit for members of staff to refer to (Brown & Timmins, 2005)
• There is an identified link/lead person for the assessment and management of pain (Gallo, 2003)
• Parents/carers are taught to assess/observe for pain and report signs that their baby may be in pain to the multidisciplinary team (Gale et al, 2004; Herr et al, 2006)
• Parents/carers are involved with decisions about their baby’s pain management (Franck et al, 2001)
• Parents/carers are taught how to use appropriate comforting techniques when necessary (Gale et al, 2004; Herr et al, 2006)
• Written information about pain assessment and management is available for parents/carers as appropriate (Gale et al, 2004)
• Information provided to parents/carers about neonatal pain is documented in their baby’s notes/careplan (NMC, 2005)
• A validated pain assessment tool is in use (Clifford et al, 2004; Duhn & Medves, 2004; Brown & Timmins, 2005; Herr et al, 2006)
• Staff performing the assessment of pain have received instruction in the use of the tool (Clifford et al, 2004)
• Assessment is documented in baby’s notes/careplan (NMC, 2005)
• Assessment is acted upon and babies receive appropriate treatment for the level of pain assessed (Clifford et al, 2004)

(Trent neonatal benchmarking group, 2009)
It is possible to see that some of the above points are reiterating recommendations already highlighted within the national guidelines whilst some of the recommendations are new. A summary of all the recommendations highlighted from the guidelines discussed so far is bullet pointed below. Discussed below each bullet point is a critique of how these recommendations are incorporated into local guidelines.

5.4 - Local guidelines

The full unit guidelines can be found in appendix 2. Bulleted are the recommendations from the guidelines discussed so far.

- Protocols need to be in place for pain assessment (DoH, 2007)/ Evidence based guidelines (RCPCH, 2001) and are reviewed according to trust policy (Hutchinson & Hall, 2005 cited in Trent neonatal benchmarking group, 2009)

Obviously the existence of local unit guidelines fulfils this recommendation.

- Plans need to be in place for pain relief (DoH, 2007)

The guidelines do indeed have in place ‘plans for pain relief’. The guidelines recommend that a pain score of 1-5 be addressed by the use of comfort measures (as recommended by Hodgkinson et al, 1994), including the removal of the painful stimulus if possible; re-positioning the infant or nappy change; wrapping the infant or containment holding; reducing environmental stress such as light and/ or noise; touch – stroking; non-nutritive sucking, and; talking to the baby. The use of sucrose during minor procedures is also encouraged.
The guidelines recommend that scores greater than 5 should have the above measures implemented, and the infants pain score re-assessed after one hour. This reassessment after intervention is in line with recommendations from the Association of Paediatric Anaesthetists (2008). The guidelines recommend that if the score remains at 5 or above after one hour then a full clinical assessment and review of the baby should be considered and that this may include analgesia.

- Regular audits need to be carried out (DoH, 2007; Trent neonatal benchmarking group, 2009)

Regular audits are indeed carried out in line with the above recommendation. The unit guidelines state that audit points include ‘Observation charts, Prescription charts, and Parental feedback/ complaints’. However it is not possible to tell whether the frequency of pain assessment is examined in the audit.

- Harrison et al (2002) suggests that pain assessment needs to be routine. Whilst RCN (2009) guidelines suggest pain needs to be assessed at regular intervals according to the individual neonates needs

The local guidelines do provide recommendations as to how often pain should be assessed but state that individual babies will have their pain assessed and managed ‘...on an individualised basis’ (Nottingham Neonatal Services, 2007, page 1). This is as set out by the RCN (2009) guidelines and in line with Anand and The International Evidence-Based Group for Neonatal Pain, (2001) recommendations that pain assessment should be individualised. The unit guidelines recommend that an initial assessment is carried out on admission, and then BAPM level I (requiring intensive care) and level II (requiring high dependency care) babies have their pain reassessed every hour as a minimum, and level III (special care) babies a minimum of once every 3 hours (Nottingham
The guidance adds that ‘All members of the neonatal team may...increase the frequency of scoring’ (Nottingham Neonatal Services, 2007, page 2). This is much more frequently than that recommended by Anand and The International Evidence-Based Group for Neonatal Pain (2001) who recommend 4-6 hourly pain assessment.

- Be vigilant for signs of pain (changes in behaviour and/or physiological signs) and anticipate pain (RCN, 2009; RCPCH, 2001). Guidelines from the RCPCH (2001) add that gestational age, behavioural state and previous pain history need to be taken into account
- Use a validated tool to assess pain if pain is suspected/anticipated (RCN, 2009; RCPCH, 2001; Trent neonatal benchmarking group, 2009)

Looking for the signs of pain as recommended within the RCN (2009) and RCPCH (2001) guidelines is incorporated into the pain tool chosen to be used on the unit. The use of a pain tool being highlighted to assess pain is recommended within the RCN (2009) and RCPCH (2001) guidelines. However factors including gestational age, behavioural state and previous pain history are not incorporated into the units chosen pain tool.

- Consider chronic pain when carrying out pain assessment (DoH, 2007)

The author of this dissertation believes that the tool recommended for use within the local guidelines does not encapture chronic pain signs; the differences in the signs of acute and chronic pain were highlighted in chapter two.

- Pain assessment needs to be documented (RCPCH, 2001; Trent neonatal benchmarking group, 2009). The Association of Paediatric Anaesthetists...
(2008) and the Trent neonatal benchmarking group (2009) add that it also needs to be acted upon and then reassessed.

The local unit guidelines recommend that pain scores be ‘...recorded on the intensive care charts, along with any pharmacological or non-pharmacological interventions initiated as a response to the pain score’ (Nottingham Neonatal Services, 2007, page 2).

- Both RCPCH (2001), the Association for Paediatric Anaesthetists (2008) guidelines and the Trent neonatal benchmarking group (2009) suggest encouraging parents to participate in the pain assessment of their child, explaining in order for them to do this, they need to be provided with information on pain assessment and their role within it. The Trent neonatal benchmarking group (2009) continues that written information be provided to parents as appropriate and that their participation/involvement be documented in their babies careplan.

The unit guidelines do recommend that ‘assessment should include views expressed by parents and other caregivers’. With regards to including parents’ views, the local units’ guidance is in line with recommendations by both RCPCH (2001) and the Association for Paediatric Anaesthetists (2008) guidelines. The unit guidelines states that pain assessment can be done upon parents request. However, unlike the recommendation made in other evidence, the unit guidelines do not recommend the use of providing parents with information to aid them in this.

In addition to parental perception, the unit guideline state that nurses’ perception was thought to be an important factor in pain assessment in the formulation of the guidance (Nottingham Neonatal Services, 2007), and is therefore included in
The pain assessment tool of choice. However, no research to support this suggestion is quoted in the guidelines. Also, the views of parent/s/ carer/s and/or nurses are represented by only up to 2 points out of a total pain score of 20 in the units chosen pain tool.

- The RCPCH (2001) guidelines highlight the need to educate health care professionals. The Association for Paediatric Anaesthetists (2008) concur suggesting that clinicians need to be educated about both pain and the use of pain assessment tools (Simons et al, 2001; Dodd, 2003; Clifford et al, 2004 all cited in cited in Trent neonatal benchmarking group, 2009). The RCPCH (2001) adds that clinicians need to make informed choices about which pain assessment tool to use. The Trent neonatal benchmarking group recommend that up-to-date research-based information on the assessment and management of pain is available on the unit for members of staff to refer to (Brown & Timmins, 2005). These guidelines also recommend there be an identified link/ lead person for the assessment and management of pain (citing evidence from Gallo, 2003).

The unit guidelines however do not highlight recommendations surrounding staff education. This is not in line with best practice.

The following recommendations are not highlighted in the previously discussed guidelines but instead are recommendations taken from the literature. Why these recommendations are not included in professional guidelines is questionable.

- Painful episodes need to be predicted and avoided/ alleviated if possible, as recommended by PAMINA (2008). Pasero (2007) suggests that nurses should assume that pain will be present during procedures that would cause pain in adult patients. Chiswick (2000) and Anand (2007) concur
adding that nurses need to estimate this pain whilst Pasero (2007) suggests giving analgesia before procedures known to be painful.

- The neonates underlying pathology and factors such as whether they've recently had surgery should also be considered as recommended by Pasero (2007).

The consideration of these contextual factors are in factor included in the units pain assessment tool of choice. However, the author of this dissertation would question whether the 2 points out of the possible 20 given to this category is fairly weighted?

- Anand and The International Evidence-Based Group for Neonatal Pain, (2001) suggest the creation and use of individualized care plans for pain assessment, which take into consideration clinical and contextual factors (such as the above) for each patient.

The use of individualised careplans is not a recommendation set out in the unit guidelines but arguably should be?

Other points from local guidelines

The unit guidelines state that the pain assessment tool chosen meets the RCN (1999) clinical guideline recommendations, those of the RCPCH (2001) as well as the regional benchmark standard. The guidelines state that the pain assessment tool for the unit was chosen because it ‘...uses behaviourual and physiological indicators for pain in neonates...’ and is quick to perform.

The unit guidelines acknowledge that the chosen pain assessment tool is not suitable for use on infants who are pharmacologically muscle relaxed, however,
whilst they do not offer an alternative tool, they do state that these infants should be receiving opiate sedation/analgesia.

Chapter summary

This chapter has critically reviewed and analysed professional guidelines surrounding neonatal pain assessment at national, regional and local level. Recommendations for best practise have been identified from these guidelines, and these guidelines critiqued against the theory introduced within chapters one and two of this dissertation. There are some recommendations highlighted within the theory that are not incorporated into best practice guidelines – it is questionable as to why this is.

With regards to frequency of assessment, there is variation throughout the guidelines and the literature as to how often assessment should take place. There is some agreement that it needs to be individualised taking into account contextual factors surrounding each neonate.
CHAPTER 6 - Pain assessment in practice

This chapter aims to critically review and evaluate relevant evidence to examine how nurses assess neonatal pain in practice.

In the search of the literature, there was only one piece of research that sought to examine the process that nurses go through when assessing pain in practice. There being so little research on this area of nursing surprised the author of this dissertation. This research found was conducted by Fuller et al (1999), whose study found that paediatric nurses go through 6 stages in infant pain assessment. Interestingly, the actual assessment of levels of pain only accounts for one of these six stages. Although the research by Fuller et al (1999) is the only piece of research examining the whole process of ‘pain assessment’ other pieces of research have looked into different aspects of the process, this research is integrated into this discussion below.

The 6 stages suggested by Fuller et al (1999) are:

1. acknowledging the infants distress signals

Fuller & Neu (2001) suggests that a cue of infant distress, such as crying, starts the nurses’ pain assessment. However, questions arise over this finding - What exactly are ‘distress signals’? Does this mean that only when a neonate shows ‘distress signals’ can pain assessment begin? Is it better to, as recommended in the previous chapter, to predict pain and alleviate it when possible before it gets to this stage? Is it ethical to wait until the neonate shows distress signals before doing anything? The author would also question what happens in cases such as when the patient is intubated? – watching for distress signals such as crying would not be applicable in this situation.
2. hypothesising about the cause(s) of distress
3. considering clinical data and judgements
4. comforting measure testing
5. applying the principles of consolibility
6. assessing levels of pain

This may be through the use of a pain assessment tool.

Although this study included infants up to 12 months of age as well as neonates, the author feels that this particular piece of research is very eye opening. The author feels this is so because it shows that the actual assessment of ‘levels of pain’ is actually the final step in a multi-step process – it is not the be all and end all of ‘pain assessment’. If in fact a pain assessment tool was the chosen method to ‘assess levels of pain’, if comfort measures resolve the ‘infants distress signals’ then the use of a pain assessment tool in stage 6 is redundant. From this, the author questions exactly what constitutes pain assessment? If the sixth stage of this process is not carried out, has pain assessment not been performed? From this questioning, the author would suggest that if nurses are continually looking out for ‘distress signals’ are they continually assessing pain?

With regards to stage 6 – assessing levels of pain, there is no agreed way in which this is best done. The RCN (2009) and RCPCH (2001) recommendations specify that this should be done through the use of a pain assessment tool, but the evidence behind the use of such tools is very mixed;

There is support for the use of pain assessment tools, with the rationale behind which being that they provide a standardisation in assessment (Bueno et al, 2007). A consensus article from the International Evidence-Based group for

Another positive in the use of pain assessment tools is that they give a quantitative measure making pain assessment ‘…easier to communicate between health professionals...’ (Reyes, 2003). This is useful because, as suggested by East (2000), the use of tools ‘...leads to a common language for written and visual observations’ and from this ‘...enhanced pain management will result...’ (Duhn & Medves, 2004 pg 137).

A full critique of all the individual tools available is beyond the scope of this dissertation and has already been carried out several times. Therefore the advantages/ disadvantages/ limitations of individual tools and studies are not discussed here. Instead some of the drawbacks of pain assessment tools as an entity are discussed.

Spence et al (2003) says many tools are for research (as does Boyd, 2003; Schollin, 2005; Gibbins et al, 2003; Van Dijk et al, 2004), and because of this Spence et al (2003) suggests ‘...their practicality for clinical practise is uncertain’ (page 80), adding that many tools have not been tested for clinical validity, reliability nor generalizability.

Whilst Spence et al (2003) states ‘...a single, practical and easy to use tool is required to ensure consistency in the assessment...of infants pain’ (page 84), in practise this is not feasible. This is because different tools have been developed for use on specific groups of neonates (term/ preterm) and/ or during specific interventions (procedural pain/ post operative pain/ chronic pain assessment). Because of this, Spence (2003) suggest that clinicians are in doubt as to which
tools are most appropriate – there are over 40 different published tools alone. Because different tools are developed for different groups/ interventions, no one golden tool exists (Anand, 2007; Harrison et al, 2002; Pasero, 2002a; Gibbins et al, 2003; Coleman et al, 2002). Ranger et al (2007) suggest that NICU staff must be trained to use several tools due to their being no gold tool for every scenario, however they question whether this would really work in clinical practice. Surely, through using several tools within practise, the standardised method in which using one tool is meant to provide would be diminished?

With regards to frequency of pain assessment, this practise of waiting for the infant to show signs of distress before starting a pain assessment is not in line with recommendations within professional guidelines highlighted in the previous chapter, which suggest the routine assessment of pain. It could be suggested that alongside the routine assessment of pain, the routine prevention of pain needs to take place – this could include the use of regular analgesia when necessary.

If nurses weren’t reliant on neonates to initiate the process of infant pain assessment, how often should it be assessed? Is it being assessed continually as previously suggested?

Harrison et al (2002) states that pain assessment should be a routine component of nursing assessment, although they do not state how often this nursing assessment should take place – Do nurses asses patients every time they see patients, looking for signs of pain subconsciously? Or, are Harrison et al (2002) referring to a more formal type of nursing assessment such as through the use of a pain tool.
Anand and The International Evidence-Based Group for Neonatal Pain (2001) suggest a time frame in which they recommended pain assessment be documented - every 4-6 hours. It is interesting to note that they use the phrase ‘pain assessment documented’ – does this mean that pain assessment itself can be carried out more frequently? Anand and The International Evidence-Based Group for Neonatal Pain (2001) suggest this frequency as part of the development of evidence-based guidelines for the management of neonatal pain. Other than this one recommendation, no other literature was found offering recommendations into how often neonatal pain assessment should take place. A possible explanation for this is offered by Boyd et al (2003) who suggest that ‘...infants are subject to a rapid change in clinical condition, therefore the best time to assess them for pain is questionable and thus omitted from the protocol of most scales’ (page 125).

Chapter summary

This chapter sought to examine how nurses assess neonatal pain in practise. However, in conclusion the author of this dissertation would suggest that the research reviewed and evaluated has brought about more questions than it has answered.

What is the actual assessment of pain? In some research pain assessment refers solely to the use of a pain tool, whilst other research (Fuller et al 1999) suggests that nurses continually look out for the signs of discomfort in an infant and from this a formal assessment of pain may be initiated.

The author feels that the terminology of this aspect of nursing care is confusing and questions whether ‘pain measurement’ is more appropriate? Gibbins et al (2003) state that ‘Measurement is defined as the quantification of pain’ (pg 477).
CHAPTER 7 - Nursing practice vs. nursing guidelines

This chapter seeks to combine the evidence examined in the previous two chapters in order to evaluate whether or not pain assessment and its frequency is carried out by nurses is adequate and/or in agreement to that set out in best practice guidelines. If the author concludes that it is not, to then explore why this may be.

Similarly to there being a lack of research showing how neonatal nurses assess pain in practice, there is not a vast amount of research that looks to examine the adequacy of neonatal pain assessment in practice.

When reviewing the research obtained from the systematic search, only several studies were found looking to examine whether or not pain assessment in neonatal units was adequate. Research by Schollin (2005) found that 86% of Swedish neonatal units measure pain in everyday care. However, the research doesn’t make clear what it means by ‘everyday care’ such as how often pain is assessed and when. Fernandez & Rees (1994) and Porter et al (1999) suggest that painful procedures are commonly performed in NICUs without adequate pain assessment and management and similarly Simons et al, (2003), Anand, (2001) and Porter et al, (1997) suggest that pain in neonates is not treated adequately suggesting that there is a gap between scientific knowledge and clinical practice. However, the author of this dissertation would question this statement further as the ‘scientific knowledge’ behind the best way of assessing pain in neonates is not rock solid – there is no gold standard.

Research by Bueno et al (2007) aimed to ‘Identify pain assessment methods used by nursing staff in neonates who underwent cardiac surgery; to verify the frequency of pain assessment, and to identify the prevalence of postoperative
pain in neonates who underwent cardiac surgery’. It is important to note that their research only involved neonates of over 35 weeks gestation and that it was solely based on post-operative pain assessment. The research found that; behavioural and physiological changes were used as a method to assess pain in 23.3% of neonates; a pain scale (NIPS) was used in 30%; both behavioural and physiological changes combined to a pain scale was used in 26.7% of neonates and; no assessment was used on 20% of neonates in the study. The research found that 70.8% of the neonates received 7 or more pain assessments between the 24th-47th postoperative hours. The authors concluded that there is no agreement related to the optimum frequency of post-operative pain assessment. They found variations showing that pain assessment may be performed at every care delivery ‘...before and after any painful or invasive procedure; concomitant to vital signs assessment; where there is some suspicion of pain; and also at established intervals from four to eight hours’. They recommended that ‘Further studies are fundamental to provide evidence on the best instruments for neonatal postoperative pain assessment and also to establish the ideal frequency and intervals for pain assessment in neonatal patients’.

Citing research, Kochler et al, (2001) state that ‘studies demonstrate that pain is under assessed, poorly documented’. From this, the author would question whether pain assessment might in fact take place, but documentation not be done. Research by Gallo (2003) highlights this possibility – they found that often when pain assessment has been carried out, documentation is often absent or poorly recorded. Gallo (2003) suggests that ‘Nurses provide little if any documentation...of the newborn’s pain level and the interventions used to address it.’ Similar research by Simons and MacDonald (2006) cited in Association of Paediatric Anaesthetists, (2008) identified inconsistencies between reported assessment practice and documented practice.
Results were obtained from the benchmarking audit from the local unit mentioned earlier on in this chapter. This audit was probably the most reliable piece of evidence obtained in the search, and it helped that the author was able to clarify points in the audit by discussion with the person who carried it out. The advantages of doing this have been highlighted by Khan et al (2003).

The results of this audit are now displayed. Unfortunately, the scoring was done in sections, rather than on individual points, this would have gave a more thorough picture of pain assessment practices and procedure on the unit.

<table>
<thead>
<tr>
<th>BENCHMARK</th>
<th>2/4</th>
<th>2/4</th>
<th>3/4</th>
<th>3/4</th>
<th>2/4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence based, references clinical guidelines are in place relating to neonatal pain assessment and management (RCPCH, 2001)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical guidelines are reviewed in line with Trust policy (Hutchinson &amp; Hall, 2005)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incidents highlighting sub-optimal care regarding poor technical skills causing pain are reported using individual trusts clinical risk procedure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compliance with the guidance is audited according to Trust policy</td>
<td>2/4</td>
<td>2/4</td>
<td>3/4</td>
<td>3/4</td>
<td>2/4</td>
</tr>
<tr>
<td>All staff are educated about the assessment and management of neonatal pain, including the use of an appropriate assessment tool and intervention strategies when required (Simons et al, 2001; Dodd, 2003; Clifford et al, 2004)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff competence in the assessment and management of pain is assessed and documented (Henry et al (2004)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up-to-date research-based information on the assessment and management of pain is available on the unit for members of staff to refer to (Brown &amp; Timmins, 2005)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statement</td>
<td>1/4</td>
<td>3/4</td>
<td>2/4</td>
<td>2/4</td>
<td>1/4</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
<td>-----</td>
</tr>
<tr>
<td>There is an identified link/ lead person for the assessment and management of pain (Gallo, 2003)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents/ carer are taught to assess/ observe for pain and report signs that their baby may be in pain to the multidisciplinary team (Gale et al, 2004; Herr et al, 2006)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents/ carers are involved with decisions about their baby’s pain management (Franck et al, 2001)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents/ carers are taught how to use appropriate comforting techniques when necessary (Gale et al, 2004; Herr et al, 2006)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Written information about pain assessment and management is available for parents/ carers as appropriate (Gale et al, 2004)</td>
<td>2/5</td>
<td>1/5</td>
<td>2/5</td>
<td>2/5</td>
<td>3/5</td>
</tr>
<tr>
<td>Information provided to parents/carers about neonatal pain is documented in their baby’s notes/ careplan (NMC, 2005)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A validated pain assessment tool is in use (Clifford et al, 2004; Duhn &amp; Medves, 2004; Brown &amp; Timmins, 2005; Herr et al, 2006)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff performing the assessment of pain have received instruction in the use of the tool (Clifford et al, 2004)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment is documented in baby’s notes/ careplan (NMC, 2005)</td>
<td>4/4</td>
<td>4/4</td>
<td>4/4</td>
<td>2/4 - assessment not documented</td>
<td>2/4 - assessment not always documented</td>
</tr>
<tr>
<td>Assessment is acted upon and babies receive appropriate treatment for the level of pain assessed (Clifford et al, 2004)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Critique of benchmarking audit

From these audit results, it is possible to identify areas of pain assessment recommendation that are adhered to on the unit, and other areas that are not. However, because the audit was scored in sections, it is not possible to identify which recommendations are, or are not implemented. This is a limitation of this audit.

Section four, scored well but fell down on documentation not always being done. These comments were recorded on the audit. This reflects the findings of the research by Gallo (2003) discussed above. However, do the results of this benchmarking audit indicate whether pain assessment is adequate or inadequate? – who knows – like pain assessment itself, the adequacy of pain assessment is difficult to evaluate.

Whilst it is not possible from this audit to state whether pain assessment is, or is not adequate, literature offers possible explanations into why neonatal pain assessment may be inadequate:

Some researchers such as Franck (2002) suggests that it is because of a lack of a single appropriate and useful tool that bring about inconsistencies in the assessment of neonatal pain and deem it inadequate. Whereas the Association of Paediatric Anaesthetists (2008) cites research by Broome et al (1996) and Karling et al (2002) that suggests that the reason for the inadequacy is due to tools not being used consistently or well. On the other hand, Beal (2005) suggests that the benefit of using pain assessment tools is questionable, stating that ‘there have been no reports on the usefulness of pain assessment scales in the routine assessment of infants in the NICU’.

Page 51
Other researchers suggest that lack of education of clinicians, either on pain assessment tools, or pain in neonates in general, or both, is to blame for inadequate pain assessment. From the above audit, it is not possible to evaluate whether or not education of staff took place. Fuller & Neu (2001) and Boyd (2003) highlight the need to educate clinicians. Mathew & Mathew (2003, pg 110) suggest that this education needs to seek to improve ‘...the physicians awareness of neonatal pain, appreciation of situations wherein pain occurs, sensitivity to the need for controlling pain and a generous amount of common sense’. Controversially there is no mention on educating on the use of pain assessment tools.

However, even when education has been offered Gallo (2003) suggests that ‘It is often challenging to implement new ideas into clinical practise.’ Harrison et al (2006) concur, suggesting that this reason may be a contributing factor to the low usage of standardised pain assessment tools in routine clinical practise.

At the end of the day, the author of this dissertation would suggest that the best explanation, and one that arguably encompasses all these other suggestions is that inadequate/ inaccurate assessment of pain is ‘Because of the inherent difficulty in assessing pain in non-verbal infants, assessment is frequently not done’ (pg. 117).

It is important to highlight that guidelines are only guidelines, and that nurses as professionals use their clinical judgement within practice. This is highlighted by The Royal College of Paediatrics and Child Health (RCPCH, 2001) who state Guidelines are ‘...systematically developed statements to assist decisions about appropriate care for specific clinical circumstances...not intended to restrict clinical freedom’, however they do highlight that ‘...practitioners are expected to use the
recommendations as a basis for their practice’. The unit guidelines state that ‘clinical judgement’ is needed to decide whether a baby is in pain.

Chapter summary

This chapter sought to evaluate whether or not pain assessment and its frequency is carried out by nurses is adequate and/or in agreement to that set out in best practise guidelines.

From the evidence obtained and discussed, it is not possible to evaluate whether or not pain assessment is adequate, because the very notion of adequate pain assessment and the best ways of doing so has not/cannot be defined.

With regards to whether or not pain assessment frequency is adequate, no evidence has examined this aspect. Maybe this is because, similarly to above, the optimum frequency of pain assessment in neonatal care has not been set. Therefore it is difficult to evaluate.

However, possible explanations into why pain assessment may be inadequate were explored. Possible explanations suggested included there being no gold standard/tool (Franck, 2002); tools not being used consistently or well (Association of Paediatric Anaesthetists, 2008); lack of education of clinicians, and; poor implementation of education into practice (Gallo, 2003).
CHAPTER 8 - Recommendations for practise

This chapter summarises a number of operational, and strategic recommendations for clinical nursing practice that have been identified throughout the literature included in this dissertation.

Operational recommendations

Nurses need to be vigilant for any indication of pain, and anticipate pain in neonates and children at all times. If pain is suspected or anticipated, a validated pain assessment tool should be used (RCN, 2007; RCPCH, 2001; Trent Neonatal Benchmarking group, 2009). However one needs to bear in mind that children may display individualised specific reactions to pain (RCPCH, 2001). A pain history and factors such as gestational age also is important (RCPCH, 2001). Pasero (2007) recommends that the neonates underlying pathology and factors such as whether they’ve recently had surgery should also be considered. This could be done through, as suggested by Anand and The International Evidence-Based Group for Neonatal Pain, (2001), the creation and use of individualized care plans for pain assessment, which take into these consideration clinical and contextual factors for each patient. Nurses also need to consider the less obvious signs of chronic pain; the inclusion of a pain history within the patients care plan would help in this consideration.

Painful episodes need to be predicted and avoided/ alleviated if possible (PAMINA, 2008), and, as suggested by Pasero (2007) nurses should assume pain will be present during procedures that would cause pain in adult patients. Plans need to be be made and implemented for pain relief during planned procedures (DoH, 2007) and when predicted. Parents should be given sufficient information and encouragement to participate in the pain assessment of their baby (RCPCH,
2001; The Association of Paediatric Anesthetists, 2008; Trent Neonatal Benchmarking group, 2009).

With regards to documentation, nurses need to assess, record, and re-evaluate pain at regular intervals (RCN, 2009; The Association of Paediatric Anesthetists, 2008). The frequency of which should be determined according to the individual needs of the child and setting (RCN, 2009).

**Strategic recommendations**

Protocols should be in place for the assessment, prevention and management of pain (DoH, 2007; Trent Neonatal Benchmarking group, 2009), and the effectiveness of which should be demonstrated by regular audits (DoH, 2007; Trent Neonatal Benchmarking group, 2009).

Health professionals should be trained to recognise and assess pain (RCCH, 2001; Trent Neonatal Benchmarking group, 2009).
Chapter 9 - Further research

As previously mentioned, there is a significant lack of recent (within the last 10 years) research examining how nurses assess neonatal pain in practice – because of this; this is clearly an area that needs further research.

The use of pain assessment tools within practice and their clinical use also requires further research. Duhn & Medves (2004) suggest a number of areas for further research surrounding the use of pain assessment tools in practice including:

- Research needs to be done to evaluate the impact of pain assessment tools on pain management practices
- Research needs to be done to evaluate whether using pain assessment tools make a difference in reducing the long term effects of pain
- Research needs to be done to answer questions about the impact of parent’s and staff’s perception of pain assessment tools

There needs to be more research on the affects and assessment of chronic, longer lasting, internally generated and post-operative pain (Grunau et al, 1998), and also with regards to the optimum frequency of pain assessment.

In the interim, as there is no gold standard in pain assessment, nurses and other clinicians need to focus on preventing and predictive pain, and giving early interventions to prevent pain as applicable.
CHAPTER 10 - CONCLUSION

It is not possible to evaluate whether pain assessment in neonatal practice is adequate because there is no gold standard to assess pain, nor assess the adequacy of the assessment of pain. There are also questions over what constitutes as an assessment - ‘Assessment’ can be done without documentation and informally – the nurse may subconsciously assess the infants’ level of pain, suggesting that nurses are continually assessing pain. Further to this, the actual notion of pain assessment is suggested as the final stage in Fuller and Neu’s (2001) findings of how nurses go about assessing pain – if a nurse believes the infant not to be in pain, a formal pain assessment, which may or may not involve the use of a tool, may not need to be done. Nurses, as professionals, use their own judgement – one could question can/ should this be applied to the assessment of pain?

Pain assessment can be carried out without the use of a tool. After all, as highlighted within the discussion factor of this dissertation they work in theory but their use in practice is uncertain.

Most research on tools is based on procedural pain. However it could be suggested that procedural pain doesn’t even need to be assessed - if a procedure needs to be carried out, it needs to be carried out and pain should be predicted and relevant intervention (such as analgesia) put in place before the intervention/procedure. The author feels that pain assessment needs to focus more on chronic pain yet this is where research is lacking. A move towards alleviation and prevention of pain already occurs to some extent in practice demonstrated by the clustering of cares and interventions when possible. In the authors practice, the use of sucrose to alleviate procedural pain occurs sporadically, but this is a relatively new intervention to comfort neonates.
With regards to the use of tools using indicators such as behavioural and/or physiological changes, pain can only be inferred. Changes in such parameters do not indicators pain solely, but a more general activation of the central nervous system, which could be due to pain or a number of other factors. Because of this it could be suggested that ‘stress assessment tool’ may be more appropriate than ‘pain assessment tool’. Using this, and the ideas highlighted in chapter six – would ‘stress measurement’ – the quantification of stress, be more appropriate?

To conclude, nurses should predicting and alleviate pain, whilst being aware, through education, of the signs that may indicate that a neonate is experiencing pain. The use of a tool should be used alongside clinical judgement with regards to when it is used, whilst education should include the need for nurses to be aware of the signs of chronic pain, and that the fact that an infant is in chronic pain may not be highlighted through pain assessment tools. Contextual factors discussed throughout this dissertation (such as gestational age/ diagnosis/ pain history) need to be taken into account. All this needs to be taught to nursing staff through the use of education.

Through evaluating the adequacy of pain assessment, the need for documentation became an issue that needed addressing. It became clear that a lack of documentation surrounding pain assessment is an issue, and without such, it is difficult to evaluate whether or not pain assessment is adequate.

Prior to researching and writing this dissertation, the author thought that because pain assessment tools were being used only intermittently in practise, pain assessment might not have been adequate. According to BAPM guidelines cited in the local unit guidelines (Nottingham Neonatal Services, 2007), pain assessment wouldn’t have been consider adequate because pain assessment tools are not
used hourly as the guidelines suggest. However, through this research, the author has come to the conclusion that maybe a pain assessment tool isn’t used due to the evidence that they are not as effective in clinical practise as they are in theory, and so nurses use other methods to assess pain. Another reason may be that maybe pain assessment was being carried out but because of lack of documentation it seemed that it was not so. This lack of documentation may be a big factor in the fact that pain assessment may appear to be being assessed less than it actually is. This research has highlighted that nurses use their professional judgement in pain assessment, and that the notion of ‘pain assessment’ is much more than the documentation of a pain assessment score from a tool, which is carried out at a certain interval. Researching the evidence for this dissertation made the author realise this, and it is hoped that this dissertation, through highlighting this relevant evidence will educate nurses on this important aspect of nursing care.

This dissertation sought to evaluate current neonatal pain assessment practice however, for reasons discussed above, it was not possible to evaluate whether or not it is adequate. Instead recommendations were given to allow best pain assessment practices, which hopefully nursing and other clinical staff within neonatal services who may read this dissertation, will implement into their clinical practice. These readers should also take away with them the importance of implementing these recommendations for pain assessment to ensure they provide good pain management in practice.
Chapter 11 - Limitations

This chapter seeks to highlight some of the limitations of this dissertation, most of which are methodological in nature.

Time was a limiting factor in the development of this dissertation. If time was not an issue I would have re-run the systematic search at a later date due to the initial search being performed in November 2009 (It is currently March 2010). The importance of this is highlighted by Khan et al (2003). They also recommend the searching of key journals and by hand due to the fact that articles can take up to a year to appear in databases.

Similarly to the above, a search of the key authors who have published work within this area may have proved beneficial, but again, due to the time constraints this was not possible. If time was not an issue, a more comprehensive search could have been performed that may have found more relevant articles by not restricting the search terms to the title. By restricting the inclusion criteria to only include studies published in the last 10 years may have reduced the comprehensiveness of this study, because although it sought to evaluate neonatal pain assessment as it is currently, studies published outside this 10-year window may have been relevant to current practice. The inclusion of studies from the reference lists of relevant studies, did, to some extent, allow relevant studies outside the 10-year window to be analysed and used within this dissertation if they were felt to be applicable to modern day practice.

The limitation of using selected databases through not always retrieving 100 per cent of relevant results was highlighted by the failure of the search to find studies by Boyle et al (2006) and Franck et al (2000), both of which fulfilled the search and inclusion criteria for the search but were not retrieved. Maybe this is because
search terms ‘may need to be changed’ when searching different databases (per comms).

Other limitations that became evident in a similar way were that the use of search engines on websites is not reliable. Upon, using the search engines nil results were found however, a hand search of the website produced relevant results, it could be suggested from this that maybe there are more relevant results to be found? Similarly, the search of the BAPM website found no results, however BAPM guidelines were later found through searching the reference list of the local units guidelines.

Apart from the results of the local units benchmarking audit, all the other literature searched for was published literature. It may be that the results of this dissertation are biased through publication bias, which, as discussed within the methodology section of this assignment arise due to statistically significant results being more likely to be published.
Chapter 12 - Reflection

I started this process with a different view of what I expected to find compared to what I actually have found - I expected to be able to reach a definite conclusion of whether or not neonatal pain assessment was adequate, but this, for reasons discussed throughout, has not been possible. This has made me appreciate that research is not always so ‘black and white’, in a way, this dissertation has left me with more questions that I started with! It has also brought up ethical issues surrounding neonatal care, which I didn’t, perhaps naively, expect to encounter.

I feel that if I were to commence this dissertation again, knowing what I know now, I feel that it would be a much easier process – I feel this is because, through this process I have learnt a great deal about my writing style and how I work. For example, if were to do this research again, without time constraints and with the knowledge I have now I would implement some of the suggestions highlighted within the limitation section. I would also do things such as keep all articles in alphabetical order – this would save hours of searching! I would also change the way in which I write the work – starting with the discussion section, rather than working through it in the order that it is presented here.

I also feel that I have learnt that nursing care, like research, is not so black and white – instead of pain assessment being a set task, through the use of a set tool, being carried out at a set time, there are factors that prevent this being the case. It has opened my eyes to the fact that best practice needs to be individualised to the patient, and that education plays an important role in allowing the nurse to provide this individualised best practice.

I feel that through this research I have furthered my knowledge about neonatal pain assessment, and will be able to transfer this theoretical knowledge into
practice. I hope that anyone, namely neonatal nurses, who reads this work feel the same, and with this increased knowledge can provide the best possible neonatal pain assessment for those neonates in their care.