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A Clinical Assessment Tool for Midwives and Health Care Professionals Undertaking the Newborn Infant Physical Examination --Manuscript Draft--

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Corresponding Author:	Rosemary Lanlehin, MSC, City University London, UNITED KINGDOM
Corresponding Author Secondary Information:	
Corresponding Author's Institution:	City University
Corresponding Author's Secondary Institution:	
First Author:	Rosemary Lanlehin
First Author Secondary Information:	
Order of Authors:	Rosemary Lanlehin
Order of Authors Secondary Information:	
Abstract:	<p>The role of midwives has evolved over the last two decades, and in the United Kingdom midwives and advanced neonatal nurse practitioners undertake roles that traditionally were undertaken by junior doctors. This is partly due to working time directives and the reduction in doctors' working hours (European Parliament and the Council of the European Union, 2003), although other factors, such as the early discharge of a mother and her baby and the increased birth rate (British Association of Perinatal Medicine, 2015) have contributed to the extended role of midwives and advanced nurse practitioners.</p> <p>The Newborn Infant Physical Examination (NIPE) is performed within the first 72 hours of birth, and enables midwives to provide a holistic assessment of neonates and their mothers, as well as confirming normality, identifying abnormalities, and providing early intervention for at risk neonates. In a recent local service evaluation, fifty-one parents of newborns confirmed that their babies' NIPE check was completed within 72 hours, which is in compliance with the key performance indicator, in addition, seventy-five per cent of the parents rated the standard of neonatal care as seven out of seven (Salter and Gupta, 2016). Bloomfield et al. (2003) and Townsend et al. (2004) found that mothers reported significant satisfaction regarding NIPE checks performed by midwives compared to junior doctors. Midwives are able to provide holistic care and were able discharge a mother, address breastfeeding issues, and provide postnatal care to the mothers.</p> <p>The aim of this paper is to discuss the usefulness of the Physical Examination of the Newborn Clinical Assessment Tool (PENCAT), which was originally developed as assessment guidelines for health professionals undertaking the NIPE course. However, it became clear over the course of ten years that not only is this a framework for assessing students' application of theoretical knowledge to practice scenarios, it is also an assessment tool that can be used by trained midwives, medical staff, and students nurses to enhance clinical decision making when faced with an unwell baby.</p>
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Response to Reviewers:	Revision comments uploaded under file named table
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A Clinical Assessment Tool for Midwives and Health Care Professionals Undertaking the Newborn Infant Physical Examination

Rosemary Lanlehin, Lecturer, School of Health Sciences, City, University of London

A Clinical Assessment Tool for Midwives and Health Care Professionals Undertaking the Newborn Infant Physical Examination

Abstract

The role of midwives has evolved over the last two decades, and in the United Kingdom midwives and advanced neonatal nurse practitioners undertake roles that traditionally were undertaken by junior doctors. This is partly due to working time directives and the reduction in doctors' working hours (European Parliament and the Council of the European Union, 2003), although other factors, such as the early discharge of a mother and her baby and the increased birth rate (British Association of Perinatal Medicine, 2015) have contributed to the extended role of midwives and advanced nurse practitioners.

The Newborn Infant Physical Examination (NIPE) is performed within the first 72 hours of birth, and enables midwives to provide a holistic assessment of neonates and their mothers, as well as confirming normality, identifying abnormalities, and providing early intervention for at risk neonates. In a recent local service evaluation, fifty-one parents of newborns confirmed that their babies' NIPE check was completed within 72 hours, which is in compliance with the key performance indicator, in addition, seventy-five per cent of the parents rated the standard of neonatal care as seven out of seven (Salter and Gupta, 2016). Bloomfield et al. (2003) and Townsend et al. (2004) found that mothers reported significant satisfaction regarding NIPE checks performed by midwives compared to junior doctors. Midwives are able to provide holistic care and were able discharge a mother, address breastfeeding issues, and provide postnatal care to the mothers.

The aim of this paper is to discuss the usefulness of the Physical Examination of the Newborn Clinical Assessment Tool (PENCAT), which was originally developed as assessment guidelines for health professionals undertaking the NIPE course. However, it became clear over the course of ten years that not only is this a framework for assessing students' application of theoretical knowledge to practice scenarios, it is also an assessment tool that can be used by

trained midwives, medical staff, and students nurses to enhance clinical decision making when faced with an unwell baby.

Introduction

The purpose of the NIPE is to identify and refer all children born with congenital abnormalities of the eyes, heart, hips, and testes, where these are detectable, within 72 hours of birth, and a second physical examination is performed later to identify abnormalities that may become detectable by 6-8 weeks of age, thereby reducing morbidity and mortality. NIPE screening includes a holistic 'top-to-toe' physical examination of a newborn. Once the NIPE is completed parents should be informed of the outcome of normality or any abnormality, including any explanation of the referral process if required. They should also be informed that the infant examination will be undertaken at 6-8 weeks of age, as some conditions can develop or become apparent later (Public Health England, 2016).

Ensuring an environment that is conducive for safe examinations is paramount to the assessment, the outcome of the NIPE and neonatal stabilisation. A neutral thermal environment should be maintained with an axillary temperature of 36.5 to 37.5 degrees centigrade (Newborn Life Support, 2015), and all equipment required should be gathered prior to conducting the NIPE. The issue of privacy is very challenging, especially if there are no dedicated areas for performing checks. This is an area that individual health trusts must consider in order to prevent breaches of confidentiality and a lack of sensitivity for individual families; however, some local trusts have dedicated areas allocated for NIPES. In order to facilitate an informed decision-making process, a practitioner must familiarise themselves with the NIPE and NICE guidelines, together with their local guidelines and pathways.

Despite the success of NIPES in the UK, a high number of newborn or neonates develop problems whilst being cared for in low risk post-natal settings. Early identification and management of these neonates may reduce neonatal morbidity and mortality rates (British Association of Perinatal Medicine, 2015). The Office of National Statistics (2015) recorded the annual number of live births in England and Wales in 2014 as 695,233, compared to 698,512 in 2013, a fall of 0.5%, with nine percent of these infants requiring admission to a neonatal unit for their ongoing management.

Although most midwives perform NIPes on normal babies without any antenatal, labour or post-natal complications according to their local trusts' protocol, a safe knowledge base of what is normal, what could possibly go wrong and why, is important. When faced with unusual cases, use of the physical examination of the newborn clinical assessment tool (PENCAT) may be helpful (Table 1). This tool was originally designed for use by midwives undertaking NIPes, but it could be used as a systematic assessment tool to facilitate group reflection or self-reflection in the clinical area when faced with an unexpected neonatal clinical scenario.

In order to facilitate the use of PENCAT, a midwife is presented with a sample clinical scenario on how this tool could be applied. The midwife is expected to assess the baby and differentiate between a compromised or non-compromised baby; a baby who is compromised will need urgent emergency intervention to establish their airway, breathing and circulation (Resuscitation Council UK, 2015). In an emergency or compromised baby, the Newborn Resuscitation Council's guidelines should be followed using the ABC approach. The NIPE midwifery professional will be expected to call for help and to initiate ABC management until the baby is stable or until help arrives.

Essential information is required for accurate decision making, timely referrals and patient safety (Public Health England, 2016). The physical examination of a newborn should normally be preceded by a thorough review of the mother's pregnancy, labour and delivery where possible. History taking usually includes a mother's past obstetric history, intrapartum history, maternal medical history, and family and social histories (Tappero and Honeyfield, 2003). The midwife or health care professional should also be able to make reasonable links between history taking and how the baby presents, although this process normally comes with practice and a period of consolidation. It is important to provide the rationale for any recommendations, investigations, or further management suggested by the midwife during the handover of a compromised baby to the receiving parties; SBAR – situation, background, assessment and recommendation – is the recommended handover or reporting tool. SBAR is a standardised communication tool which reduces communication variability, and enhances concise, objective, and relevant reports (Benson et al., 2007). Once the hand over is complete, all actions and interventions must be documented. It is important that parents are updated and

health care professionals must communicate in a sensitive manner with the use of plain English. Where necessary, the help of a language advocate must be organised.

Conclusions

In the current climate of financial constraints within the NHS and internationally, PENCAT, a learning tool, may help to reduce the educational and financial burden on both midwives and health trusts. This tool could be used alongside the NIPE or on its own. It is a useful decision making tool that can be used to facilitate a systematic assessment and initial stabilisation of a compromised baby on a postnatal ward or within a transitional care unit. This tool should not be used in isolation; however, it could be used to facilitate critical thinking and reflection on practice amongst qualified staff and students. The PENCAT framework could be applied to a whole range of clinical scenarios, and additional reading on specific clinical conditions is recommended as required.

Sample scenario

- Term baby, with a birth weight of 3.2 kg has been delivered.
- Uneventful pregnancy except for polyhydramnios noted on the last scan.
- At 1 hour of age the baby was found to be coughing on feeding, and turned blue with copious secretions from oropharynx.
- You are a member of the team on the postnatal ward.

Table 1:

Physical Examination of the Newborn Clinical Assessment Tool, PENCAT: Developed in 2008 by Dr Nandiran Ratnavel and Rosemary Lanlehin.

Steps
<p>A. Approach and assess the given scenario by assessing the situation and determine whether you need to treat the situation as an emergency or non-emergency scenario</p> <ul style="list-style-type: none">• In the case of an emergency situation, you must consider a safe environment for the quick and initial stabilisation of the baby.• Call for help and provide immediate stabilisation for the baby with or without the family's presence. <p>Utilising the ABC approach below assess the needs of the baby:</p> <ul style="list-style-type: none">• Airway• Breathing and ventilation• Circulation• Disability• Drugs
<p>B. Background history from the relevant people once the baby is stabilised as appropriate:</p> <ul style="list-style-type: none">• Past medical history, previous pregnancies• History of pregnancy• Antenatal screening• Labour• Drugs during pregnancy• Delivery
<p>C. Consider your differential diagnosis</p> <ul style="list-style-type: none">• Differential diagnosis is the process of weighing the probability of one disease versus the possibility of other diseases, accounting for a patient's illness. The differential diagnosis for grunting respiration in a newborn includes hypothermia, hyperthermia, sepsis, airway obstruction, prematurity etc.• The differential diagnosis for a cold baby includes sepsis, poor feeding, environmental factors, inborn metabolic error or congenital heart disease. <p>For the scenario consider:</p> <ol style="list-style-type: none">1. Tracheo-oesophageal fistula2. VACTERL associations:<ul style="list-style-type: none">• Vertebral-7 defects of spinal column• Anal atresia 80• Cardiac defects, most common ventricular septal defects (VSDs)<ul style="list-style-type: none">• Tracheoesophageal fistula and/or oesophageal atresia• Renal anomalies• Limb anomalies3. Trisomy 13 - known as Patau's Syndrome4. Sepsis

D. Diagnosis, investigations and further management once you have an established history using the ABC approach

- This will be determined by the examiner based on your response and the nature of the discussion, but this is usually within the context of the scenario.

For this scenario the diagnosis is a tracheo-oesophageal fistula:

- Common neonatal investigations include the measurement of temperature, heart rate, respiration, heel prick, venepuncture, and blood sampling for blood sugar, bilirubin level, blood gases, and blood cultures, Full blood count, chest/abdominal x-rays.

Initial actions for this scenario:

- ABC, clear secretion, nil by mouth, observation of temperature, heart rate, oxygen saturation and respiration. Insertion of a large bore nasogastric tube.

E. Explain your findings to the parents, senior colleagues and relevant midwife and/or refer to a multi-disciplinary team

- Use SBAR during your handover
- Don't forget to document and sign the necessary documents.

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Ref.: Ms. No. bjom.2016.0011

A Clinical Assessment Tool for Midwives Undertaking the Newborn Infant Physical Examination (NIPE) Training

Reviewers' comments:

Reviewer 1 comments	Changes
<p>The purpose of the PEN is to assess well healthy neonates and determine if the infant can be discharged home. Therefore decision making is a crucial part of the midwives role in undertaking this procedure. The tool, although interesting is not clear how this benefits midwives undertaking this role.</p>	<p>The aim of this paper is to discuss the usefulness of the Physical Examination of the Newborn Clinical Assessment Tool (PENCAT), which was originally developed as assessment guidelines for health professionals undertaking the NIPE course. However, it became clear over the course of ten years that not only is this a framework for assessing students' application of theoretical knowledge to practice scenarios, it is also an assessment tool that can be used by trained midwives, medical staff, and students nurses to enhance clinical decision making when faced with an unwell baby.</p>
<p>It is important that midwives are aware of neonates that may be compromised but this requires escalating to appropriate professionals. This is an interesting concept but requires careful discussion and implementation to promote the tool.</p>	<p>In order to facilitate the use of PENCAT, a midwife is presented with a sample clinical scenario on how this tool could be applied. The midwife is expected to assess the baby and differentiate between a compromised or non-compromised baby; a baby who is compromised will need urgent emergency intervention to establish their airway,</p>

	<p>breathing and circulation (Resuscitation Council UK, 2015). In an emergency or compromised baby, the Newborn Resuscitation Council's guidelines should be followed using the ABC approach. The NIPE midwifery professional will be expected to call for help and to initiate ABC management until the baby is stable or until help arrives.</p>
<p>The paragraphs are short and do not offer a clear point of what you are trying to achieve. Developing the discussions to provide a clearer explanation would help with the understanding of how the tool is used, some of the sentences also appear unfinished.</p>	<p>The paper has been revised to reflect your comments.</p>
<p>Reviewer 2</p>	<p>Revision</p>
<p>This is an important article and would prove useful not only to those midwives and medics undertaking 'Physical Examination of the Newborn' (PEN), but also to student midwives and those qualified midwives who are perhaps considering undertaking 'Newborn Infant Physical Examination (NIPE) Education and Training'.</p> <p>However, in its current state, there are significant issues which prevents the immediate publication of this article see</p>	<p>NIPE has been used consistently throughout the paper. The PENCAT is the assessment tool under discussion.</p>

<p>below.</p> <p>While there is real merit in the paper and its approach, the authors need to reach a consensus on terminology as the use of both PEN and NIPE is confusing.</p> <p>Throughout the paper the use of the abbreviations PEN i.e Physical examination of the newborn and NIPE i.e Newborn Infants Physical Examination that is often applied in relation to the education and training programme.</p> <p>I would suggest that Physical Examination of the Newborn (PEN) is a much easier use of terminology and reserve the term NIPE when discussing the education and training course.</p>	
<p>Sadly, referencing is poor. In the opening page, the Department of Health is cited in the text as (DH 2007, DH 2009 and 2010), although none of these are cited in the reference section at the end of the paper.</p> <p>I would also question why these are included as the change from paediatrician to midwives undertaking the Physical Examination of the Newborn, has moved on considerably and is done in the best interests of the newborn infant and</p>	<p>References have been checked and updated throughout the paper.</p>

<p>his/her parents. The finding of Bloomfield et al (2003) and subsequently Townsend et al (2004) in this respect, should be articulated in the paper to show that midwives were perceived to be more effective and more appreciated in this role than were junior doctors.</p> <p>Bloomfield et al (2003) in not cited in the text</p> <p>The British Association of Perinatal Medicine (2011) is also cited in the text but not included in the reference section at the end of the paper.</p> <p>The reference for the European Parliament 2003, is an EU Directive and the reference should be consistent in both the text and reference sections.</p> <p>There is also inconsistency in citing the UK National Screening Committee documents 2008 and 2016, which is cited differently in different parts of the text i.e. UKNSC 2008, NIPE 2016. It is the former which is consistent with the reference at the end of the paper</p>	
<p>On page 3, there is a significant shift in the focus of the article to the NIPE course provided by the City of London University.</p>	<p>The tool was originally designed as a VIVA assessment tool and this has been discussed in the paper. I have removed the</p>

<p>This is further compounded by reference to the requirements and number of PEN checks when undertaking degree and master's level programmes. This if needed, needs to be more effectively placed in the context of the use and value of the PENCAT tool. Indeed, given the title of the paper, this should be the principal focus of the article but it is somewhat lost in the verbiage</p>	<p>focus on City University. The value of the tool is also captured in the conclusion below.</p>
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