

# A guide on how to implement a communication tool for pain management in your NNU:

## *Prepare, Support, Protect*



### ABSTRACT

This is a guide to implementing an evidence-based communication tool about procedural pain estimation and management for neonatal staff and parents in your NNU called *Prepare, Support, Protect*.



**The authors** are part of a research partnership between University College London (UCL) and University College London Hospital (UCLH). Over the past 15 years, the group has been studying neonatal brain activity, physiology and behaviour to understand the development of pain in this population. As part of the *Brain Activity in Infants* study, they recruited over a hundred babies from the neonatal unit and postnatal ward at UCLH to understand the relationship between underlying stress, repeated pain, parental skin-to-skin contact, behaviour, and brain activity in response to a clinically required procedure.

The authors led a systematic review of babies' reported pain scores in control groups of published randomized controlled trials of pain intervention studies, which has resulted in a ranking system for the severity of common neonatal procedures. They have matched procedures, according to their pain severity, to appropriate pain management strategies in an infographic which is easy for parents and staff to use. Dissemination of this work is funded by the Medical Research Foundation's Changing Policy and Practice 2023 and endorsed by the Neonatal Nurses' Association.

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# A guide to how to implement a communication tool for pain management in your NNU:

## ***Prepare, Support, Protect***

This tool<sup>1</sup> has been developed by a team at UCL and UCLH to ease communication between staff and parents about the management of pain associated to common hospital procedures in the neonatal unit and how to best support babies.

The tool consists of a poster (which has an infographic diagram) and an explanatory video (see Appendix 1).

This document suggests steps that will help you to implement the tool in your unit in a collaborative and family-centred way.

## **1. Background information about the *Prepare, Support, Protect* tool**

Where does the *Prepare, Support, Protect* tool come from?

- a. The tool is a synthesis of evidence about procedural pain exposure in the neonatal unit.<sup>2-5</sup> It has been developed to counteract the effects of early life pain on neurodevelopment,<sup>6-8</sup> and is based on formal guidelines in pain management.<sup>9-12</sup> The tool is for parents and staff and is compatible with the family-integrated care (FiCare) model.
- b. The infographic presents the ranked estimated severity of painful procedures based on our systematic review.<sup>13</sup> Each procedure is linked to recommended pain management strategies consistent with local pain guidelines.<sup>9-12</sup>

Why is the tool important?

- a. This tool is important to alleviate discomfort during the procedure and protect the developing brain from repeated exposure to pain. There is ample evidence that repeated painful procedures in NICU are associated with global and regional brain changes, leading to long-term effects on a wide range of health outcomes. Currently, about 46-80% of common procedures are carried out without pain-relieving strategies.<sup>2</sup> This tool aims to raise awareness about the long-term negative effects of repeated pain in early life on babies' neurodevelopment and to improve this aspect of neonatal care.



- b. Ease of use and accessibility of the tool at the cot side enables parents and staff to collaborate in delivering appropriate, family-integrated pain management.

## Key messages of the *Prepare, Support, Protect* tool

- a. **Prepare** the baby and context before the procedure by looking at the *anticipated* procedural pain severity and selecting appropriate pain management to use. This involves collaborative planning with parents and/or staff. For example, the tool can be used to plan timing (e.g. daytime) and choice of family-integrated pain management (e.g. skin-to-skin plus soother with breastmilk). If parents are not available, another member of staff can support the baby, and it is important that parents know this.

Preparing also involves planning and changing the environment to enable pain-relieving strategies to be delivered safely by finding the most comfortable position for you, the parent, and the baby. For example, mothers will find a recliner more comfortable when holding their baby for a procedure. Preparing nests which contain a swaddler reduces the number of steps in getting the baby prepared for a procedure. Planning also includes choosing a stable surface for your equipment, and assembling equipment so that it is accessible.

- b. **Support** the baby to regulate pain by having the parent present as much as possible but have another staff member if the parent is not available. In doing so, the staff performing the procedure is also supported by allowing them to concentrate on executing the procedure with better accuracy, less tissue injury, and fewer attempts. Support the baby until they have recovered from the procedure, which may take up to 20 minutes, and is different for each baby.<sup>14</sup>
- c. **Protect** the baby's developing brain from the effects of early life repeated pain. The infographic's last key message raises awareness of the long-term goals of neuroprotection to reduce the negative impact on babies' future health outcomes. Displaying the infographic to both staff and parents is a method of publicly committing to consistent pain management.

## 2. What it could look like when fully implemented

### Easing communication

- a. If the *Prepare, Support, Protect* tool is implemented in all neonatal units, it will provide a standard resource to ease communication between parents and healthcare professionals. It would also make the transfer between different levels of neonatal care less stressful because of improved consistency in the approach to pain management.
- b. The tool provides parents with basic information about pain management that will be enhanced with further communication and support from the neonatal



unit's multidisciplinary team. Parental education in pain management could provide parents with the skills to continue to support their baby after discharge.

- c. The tool helps neonatal staff to explain the expected pain of different procedures, making communication with parents easier. It helps staff offer a combination of options available to manage the pain appropriately. Transparency in communication potentially helps parents gain equal control in decision-making which is the ethos of family-integrated care.
- d. A standardised estimation of procedural pain will help in consistent and transparent monitoring of pain exposure in the NNU.

## Maximising babies' comfort

Neonatal staff and parents can use the 'combined method' of pain management to maximise comfort. For example, combining skin-to-skin with non-nutritive sucking on a soother dipped in breastmilk. Or to swaddle and be held by the parent, plus the use of a soother and breastmilk.

## Considers babies' needs throughout hospital stay

- a. The tool applies to babies at all stages of their hospital journey, from early admission to getting ready for discharge home.
- b. The tool supports individualised care depending on babies' needs across their whole hospital journey and after (e.g. vaccinations in the local doctors' surgery).

# 3. How to implement the *Prepare, Support, Protect* tool in your neonatal unit

## Introduce the tool to your senior team

- a. Show the tool and discuss it with your nurse manager, clinical lead, and senior allied health professional separately or at one of your staff meetings.
- b. Provide a copy of the Infographic and video (see Appendix 1).
- c. The UCL-UCLH research group can present the tool to your NNU at pre-arranged meetings, either in person if in London, or on Teams.

## Find a core team of champions in the neonatal unit

- a. You will need the support of a core team. You may already have a pain management, developmental care or FiCare team that you can engage with this resource.
- b. If you are a single pain champion in your unit, you can receive support and guidance through a national network of pain champions.





## Engage your target audience

- a. Neonatal staff
- b. Parents in the neonatal unit
- c. Veteran parents or your local Parent Advisory Group

## Early engagement with neonatal staff (one to two months)

- a. If clinical leads are positive towards the implementation of the tool, and you have their permission, the next target would be neonatal staff.
- b. To increase acceptance of the infographic and family-integrated pain management, introduce the infographic gradually.
- c. Start informal conversations and encourage staff to ask questions.
- d. Allow enough time for staff to become familiar and comfortable with the tool before introducing the tool to parents.
- e. Once you have spoken informally about the tool to most of your colleagues, leave samples of the infographic in the staff room. Put up a poster of the infographic with the QR code on the staff noticeboard.
- f. Give regular but brief updates at shift handover to impart one or two salient points about the infographic.
- g. Email the infographic so that it is accessible to all staff.
- h. Present at unit meetings.

## Early engagement with parents (one month)

- a. If staff are generally positive towards the tool, you can start to engage with parents.
- b. You may start informal conversations with approximately 10 parents of stable babies in high dependency or special care and have been staying in the neonatal unit for a while to gauge their reactions.
- c. Show the tool to each parent at the cot side to see what they think of the infographic and to ask if they would like this to be available in the neonatal unit.

## Implement the tool

Consider staff and parent suggestions about access to the infographic to ensure that the tool will be utilised consistently. This is because each unit layout may present unique challenges to access.

- a. Do a short survey of neonatal staff and parents to find out where they might likely access the tool
  - i. Ask which locations within the neonatal unit they prefer
  - ii. Ask what barriers they face in your current workflow



- b. Assess the traffic flow in your NICU. We found that parents generally only travel between the door, sink, and to their baby's cot. We identified above the sink area within nursery rooms near cots as a popular site.
- c. Consider visibility and access to the infographic.
  - i. Assess the ideal poster size (A3 vs A4) or use of a digital poster board.
  - ii. Use matte laminate to reduce glare.
  - iii. Check placement height (ideal is at eye level) for ease of reading the tool.
  - iv. Ensure a protected space for the tool for continued access for all parents and staff.
- e. Include the infographic and QR code in your local FiCare resources section.
- d. Recommendations for siting the infographic poster:
  - i. Parents have recommended accessing the tool within nursery rooms.
  - ii. Staff have recommended placing the tool near the nurses' station within each nursery room and in treatment rooms where procedures take place.

## 4. Be part of a network of champions across the UK

Key to the sustainability of service improvement projects is building and supporting networks. We are compiling a nationwide register of pain champions which includes their name, position and contact details. Nominate one or two of your core pain champion team to be part of this network. The purpose of the network is generally to support each other with pain estimation and management practice. We will organise online meetings throughout the year where pain champions will have the chance to present their progress in implementing the tool. Here are the main activities we hope to achieve during the meetings:

- a. Take part in surveying the acceptability of the tool among staff and parents in your unit (see Appendix 2)<sup>15</sup>
- b. Share feedback on your progress and results of your survey
- c. Share insights into challenges and successes
- d. Share recommendations of what works
- e. Networking and collaboration





## 5. Key justifications for meeting performance indicators set by the Baby Friendly Hospital Initiative (BFHI)

The following disclaimers demonstrate adherence of the infographic to The International Code of Marketing of Breast-Milk Substitutes to support the Ten Steps to Successful Breastfeeding<sup>16</sup>:

1. The infographic is not an endorsement of a formula, bottle, pacifier, or any brand covered by the Code.
2. The poster was not produced or distributed by companies whose products fall under the code. To ensure clarity, there is an asterisk by the pacifier image and a disclaimer at the bottom of the page referencing the WHO document about the use of pacifiers (soothers) for pain management while supporting sick, small, and preterm babies to breastfeed in the neonatal unit.<sup>17</sup>
3. The research group does not have previous or current ties with companies whose products fall under the code.
4. The poster does not imply equivalency between breastfeeding and a pacifier as the recommendations are to combine methods to maximise comfort. This may vary depending on the baby's age and health status at the time of the procedure.
5. The pacifier image is a generic icon and does not endorse a particular brand.
6. The skin-to-skin strategy is placed in the first column to highlight its importance for pain management in preterm babies. The same column applies to term babies and breastfeeding. Babies would benefit from as much skin contact as possible and to actively breastfeed (if term or able) during the painful procedure.<sup>10,11</sup>

## 6. Conclusion

This easy-to-use guide will help you implement a new evidence-based communication tool about pain assessment and management. This will help you, your colleagues, and parents to collaborate in reducing procedure-related discomfort in neonates and protect their developing brains.



## References:

1. Laudiano-Dray MP, Meek J, Fabrizi L. Infographic: Prepare and support babies during painful hospital procedures. Pain in Childhood IASP Special Interest Group Resources. February 29, 2024. <http://childpain.org/index.php/resources/neonatal/>
2. Orovec A, Disher T, Caddell K, Campbell-Yeo M. Assessment and Management of Procedural Pain During the Entire Neonatal Intensive Care Unit Hospitalization. *Pain Manag Nurs*. 2019;20(5):503-511. doi:10.1016/j.pmn.2018.11.061
3. Cruz MD, Fernandes AM, Oliveira CR. Epidemiology of painful procedures performed in neonates: A systematic review of observational studies. *Eur J Pain*. 2016;20(4):489-498. doi:10.1002/ejp.757
4. Courtois E, Droutman S, Magny JF, et al. Epidemiology and neonatal pain management of heelsticks in intensive care units: EPIPAIN 2, a prospective observational study. *Int J Nurs Stud*. 2016;59:79-88. doi:10.1016/j.ijnurstu.2016.03.014
5. Carbajal R, Rousset A, Danan C, et al. Epidemiology and treatment of painful procedures in neonates in intensive care units. *JAMA*. 2008;300(1):60-70. doi:10.1001/jama.300.1.60
6. Chau CMY, Ranger M, Bichin M, et al. Hippocampus, Amygdala, and Thalamus Volumes in Very Preterm Children at 8 Years: Neonatal Pain and Genetic Variation. *Front Behav Neurosci*. 2019;13:51. Published 2019 Mar 19. doi:10.3389/fnbeh.2019.00051
7. Cook KM, De Asis-Cruz J, Kim JH, et al. Experience of early-life pain in premature infants is associated with atypical cerebellar development and later neurodevelopmental deficits. *BMC Med*. 2023;21(1):435. Published 2023 Nov 14. doi:10.1186/s12916-023-03141-w
8. Duerden EG, Mclean MA, Chau C, et al. Neonatal pain, thalamic development and sensory processing behaviour in children born very preterm. *Early Hum Dev*. 2022;170:105617. doi:10.1016/j.earlhumdev.2022.105617
9. Pillai Riddell RR, Bucsea O, Shiff I, et al. Non-pharmacological management of infant and young child procedural pain. *Cochrane Database Syst Rev*. 2023;6(6):CD006275. Published 2023 Jun 14. doi:10.1002/14651858.CD006275.pub4
10. Johnston C, Campbell-Yeo M, Disher T, et al. Skin-to-skin care for procedural pain in neonates. *Cochrane Database Syst Rev*. 2017;2(2):CD008435. Published 2017 Feb 16. doi:10.1002/14651858.CD008435.pub3
11. Shah PS, Torgalkar R, Shah VS. Breastfeeding or breast milk for procedural pain in neonates. *Cochrane Database Syst Rev*. 2023;8(8):CD004950. Published 2023 Aug 29. doi:10.1002/14651858.CD004950.pub4
12. Campbell-Yeo M, Eriksson M, Benoit B. Assessment and Management of Pain in Preterm Infants: A Practice Update. *Children (Basel)*. 2022;9(2):244. Published 2022 Feb 11. doi:10.3390/children9020244
13. Laudiano-Dray MP, Pillai Riddell R, Jones L, et al. Quantification of neonatal procedural pain severity: a platform for estimating total pain burden in individual infants. *Pain*. 2020;161(6):1270-1277. doi:10.1097/j.pain.0000000000001814
14. Chimello JT, Gaspardo CM, Cugler TS, Martinez FE, Linhares MB. Pain reactivity and recovery in preterm neonates: latency, magnitude, and duration of behavioral responses. *Early Hum Dev*. 2009;85(5):313-318. doi:10.1016/j.earlhumdev.2008.12.005
15. Sekhon M, Cartwright M, Francis JJ. Development of a theory-informed questionnaire to assess the acceptability of healthcare interventions. *BMC Health Serv Res*. 2022;22(1):279. Published 2022 Mar 1. doi:10.1186/s12913-022-07577-3
16. UNICEF. WHO Competency verification toolkit: Ensuring competency of direct care providers to implement the Baby-Friendly Hospital Initiative. Performance Indicators excel sheet that is the basis for Annexes A and B. August 5, 2020. Accessed October 30, 2024. <https://www.who.int/publications/i/item/9789240008854>
17. World Health Organization/UNICEF. Protecting, promoting and supporting breastfeeding: The Baby-friendly Hospital Initiative for small, sick and preterm newborns. World Health Organization and the United Nations Children's Fund (UNICEF); August 5, 2020. Accessed October 30, 2024. ISBN: 9789240005648 <https://www.who.int/publications/i/item/9789240005648>




## Appendix 1. Communication tool (Infographic) for pain management and accompanying explanatory video



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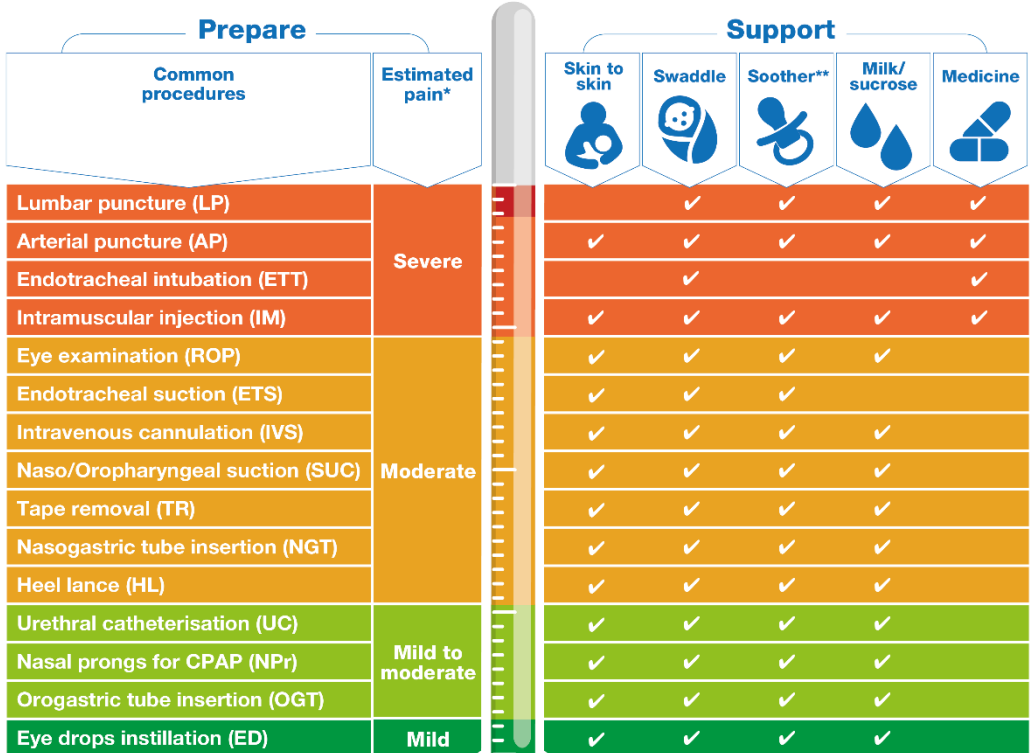


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### Prepare and support babies during painful hospital procedures

**Follow this 3-step guide:**

- 1. Prepare**
  - Use the chart below to estimate the pain from procedures
  - Parent or staff to get assistance from a second person
- 2. Support**
  - Combine ways to support appropriate for each procedure **before, during, and after** until recovery
- 3. Protect**
  - Prepare and support to protect **baby's developing brain**



Prepare		Support				
Common procedures	Estimated pain*	Skin to skin	Swaddle	Soothe**	Milk/sucrose	Medicine
Lumbar puncture (LP)	Severe	✓	✓	✓	✓	✓
Arterial puncture (AP)		✓	✓	✓	✓	✓
Endotracheal intubation (ETT)		✓	✓	✓	✓	✓
Intramuscular injection (IM)		✓	✓	✓	✓	✓
Eye examination (ROP)	Moderate	✓	✓	✓	✓	✓
Endotracheal suction (ETS)		✓	✓	✓	✓	✓
Intravenous cannulation (IVS)		✓	✓	✓	✓	✓
Naso/Oropharyngeal suction (SUC)		✓	✓	✓	✓	✓
Tape removal (TR)		✓	✓	✓	✓	✓
Nasogastric tube insertion (NGT)		✓	✓	✓	✓	✓
Heel lance (HL)	Mild to moderate	✓	✓	✓	✓	✓
Urethral catheterisation (UC)		✓	✓	✓	✓	✓
Nasal prongs for CPAP (NPr)		✓	✓	✓	✓	✓
Orogastric tube insertion (OGT)		✓	✓	✓	✓	✓
Eye drops instillation (ED)	Mild	✓	✓	✓	✓	✓

\*Babies' pain scores from 59 studies (Laudiano-Dray et al., 2020)

\*\*Disclaimer for parents: The use of soother is for the management of painful procedures in accordance with the Baby-Friendly Hospital Initiative for small, sick and preterm newborns, [www.unicef.org.uk](http://www.unicef.org.uk)

Scan for PDF, video



Direct link to the UCLH YouTube playlist:  
[https://youtu.be/yrVdSOKa1W0?si=o\\_dqQnsoC8OZ8Muc](https://youtu.be/yrVdSOKa1W0?si=o_dqQnsoC8OZ8Muc)



## Appendix 2. Adapted Theoretical Framework of Acceptability Questionnaire<sup>14</sup>

1. Do you like the look of the infographic?

Strongly dislike	Dislike	No opinion	Like	Strongly like
1	2	3	4	5
<i>*Please tell us how it could be improved</i>				

2. How much effort does it take to read the infographic?

No effort at all	A little effort	No opinion	A lot of effort	A huge effort
1	2	3	4	5

3a. How fair is displaying the infographic at the bedside for nurses and doctors?

Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1	2	3	4	5

3b. How fair is displaying the infographic at the bedside for the parents?

Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1	2	3	4	5

4. The infographic will improve my awareness of estimated pain severity of common NICU procedures.

Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1	2	3	4	5

5. It is clear to me how the infographic will guide management of painful procedures

Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1	2	3	4	5

*\*Please tell us more about your views*

6. How confident do you feel about using the infographic in discussing procedural pain with parents/your nurse or doctor?

Very unconfident	Unconfident	No opinion	Confident	Very confident
1	2	3	4	5

7. Using the infographic will interfere with my other priorities

Strongly disagree	Disagree	No opinion	Agree	Strongly agree
1	2	3	4	5

8. How acceptable is the infographic to you?

Completely unacceptable	Unacceptable	No opinion	Acceptable	Completely acceptable
1	2	3	4	5

*Any other comments?*

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### **Appendix 3. Full-text link to:**

Laudiano-Dray MP, Pillai Riddell R, Jones L, et al. Quantification of neonatal procedural pain severity: a platform for estimating total pain burden in individual infants. *Pain*. 2020;161(6):1270-1277. doi:10.1097/j.pain.0000000000001814

[https://journals.lww.com/pain/fulltext/2020/06000/quantification\\_of\\_neonatal\\_procedural\\_pain.15.aspx](https://journals.lww.com/pain/fulltext/2020/06000/quantification_of_neonatal_procedural_pain.15.aspx)

