

FINE

Family and Infant Neuro-Developmental Education

(Foundations in NIDCAP Education)

Level 2: PRACTICAL SKILLS FOR FAMILY  
CENTRED DEVELOPMENTAL CARE



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2015

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## Disclaimer

Every neonatal service has its own policies and protocols, and every infant and family has unique needs. While every effort has been made to ensure that the information in this publication is accurate and safe it is possible that some of it may differ from what is accepted practice within a neonatal service and for this reason it is important to check with the neonatal team before implementing strategies and changes recommended herewith. Also, new research may over time invalidate some of the information presented here. Neither the publishers nor the authors can accept liability or responsibility for any loss or damage allegedly arising from any information or suggestions in this book.

## About the authors

The Practical Skills programme was originally developed by Inga Warren and Cherry Bond as an in-service education programme on the Winnicott Baby Unit at St. Mary's Hospital London, now part of Imperial College NHS Trust. The UK NIDCAP\* Training Centre, then established a partnership with the Sophia NIDCAP Training Centre at the Erasmus Medical Centre in Rotterdam to create this version that can be taught more widely as part of an early and intermediate level curriculum called Family and Infant Neurodevelopmental Education (FINE) leading towards full NIDAP training.

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*The handbook will be designed by Hanneke de Wit (<http://tangramstudio.nl>), parent of a preterm infant, as a companion volume to "Caring for your Baby on the Neonatal Unit; a Parent's Handbook" by Inga Warren and Cherry Bond.*

\*NIDCAP = Newborn Individualised Developmental Care and Assessment Program

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The authors are deeply indebted to Heidelise Als and the NIDCAP for the training and support they have had as NIDCAP Professionals and Trainers over many years. NIDCAP, which has been the inspiration for much of this work, is widely recognised as the gold standard for neonatal developmental care and we hope that the FINE will set more people on the path to become NIDCAP professionals.

Throughout the book the terms Developmental Care, Family Centred Developmental Care and Neurodevelopmental Care are used interchangeably.

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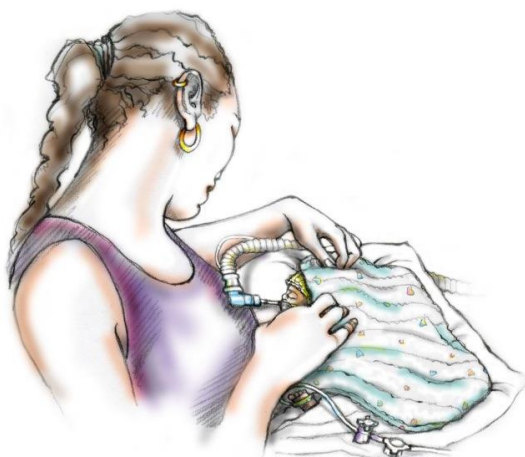
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# THE FINE CURRICULUM

# INTRODUCTION to FINE

## FAMILY AND INFANT NEURO-DEVELOPMENTAL EDUCATION



FINE is a curriculum for all healthcare professionals wishing to improve family centred developmental care in neonatal services.

### BACKGROUND

The framework for FINE comes from the Synactive Theory of Newborn Behavioral Organization and Development proposed by H. Als (1) and draws on the NIDCAP, Newborn Individualised Developmental Care and Assessment Program, ([www.nidcap.org](http://www.nidcap.org)), which is recognised as the gold standard for individualised family centred developmental care. We have incorporated

ideas from many colleagues in different disciplines and organisations around the world including Close Collaboration with Families (2), the Neonatal Behavioural Assessment Scale (3), and Patient and Family Centred Care.

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FINE began as an in-service education programme at St. Mary's Hospital (now part of Imperial College Healthcare NHS Trust) in London, which became the base for the UK NIDCAP Training Centre. Many of the tools in the programme have been adapted from the staff handbook "Guidelines for Infant Development in the Newborn Nursery" edited by Inga Warren and Cherry Bond, first published in 1999 and now in its 5<sup>th</sup> Edition as "A Guide to Infant Development in the Newborn Nursery" (4).

Collaboration between the UK NIDCAP Training Centre and the Sophia NIDCAP Training Centre in Rotterdam began in 2012 with the aim of developing an educational pathway that supports the implementation of NIDCAP, with materials suitable for international distribution. Modifications followed several trial runs and feedback from senior members of the NIDCAP Federation International (NFI). The programme has been endorsed by the NFI and by the EFCNI (European Foundation for the Care of Newborn Infants).

### THE FINE DEVELOPMENT TEAM

The FINE Team includes experienced NIDCAP trainers and NIDCAP professionals, who also bring to the programme specialised knowledge and experience from neonatology, neonatal nursing, occupational therapy and physiotherapy. Members of this team are also qualified APIB (Assessment of Preterm Infant Behavior), NBAS (Neonatal Behavioral Assessment Scale) and IBAIP (Infant Behavioral Assessment and Intervention Program) practitioners; between them they have experience of developmental care in many countries around the world.

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### THE FINE PATHWAY

The FINE curriculum introduces the principles of good practice to a wide audience, with a step by step approach. FINE helps each person to identify their level of accomplishment and to plan next steps.

While some people may want a better understanding of the scope of family and infant neurodevelopmental care others may want a pathway that prepares them for advanced studies or specialist roles. FINE also aims to provide education that helps to bridge the gap between NIDCAP professionals, their colleagues and families in the neonatal unit. Entry at Levels 2 and 3 require completion of the previous level.

Level	Title	Goals	Suitable for
1	Foundations	Raise awareness of the scope, theory and evidence that support FINE, and the key themes and components of good practice.	Essential introduction for all staff working with neonates. Useful for managers who wish to understand service needs.
2	Practical Skills	Improve personal practice; more confident partnership with parents; good role models.	Health professionals directly involved with infant care. Therapists joining the neonatal team.
3	Innovation (in planning stage)	Strengthen leadership and innovation on units.	Developmental care leadership positions; others wishing to play an active role or prepare for more advanced studies.

## KEY THEMES

All levels in the curriculum are linked by six essential THEMES that also incorporate the fundamental principles of care that is based on relationships rather than tasks.

<b>Development</b>	Knowledge of foetal, preterm and new-born growth and development, and how experience influences that development is included in lectures and recommended reading.
<b>Observation</b>	Neurodevelopmental care depends on observation of the baby. Observations are built into each FINE level, through slides, videos, or at the bedside.
<b>Family</b>	Family participation is essential for successful neurodevelopmental care. Students are encouraged to involve parents in their assignments and reflections.
<b>Reflection</b>	Reflective practice increases self-knowledge and learning through experience. Reflective exercises or diaries are included.
<b>Systems</b>	Students work towards greater understanding of strengths and challenges in their working environments; they are encouraged to identify realistic goals and problem solving approaches.
<b>Evidence</b>	Evidence based practice is promoted and the best available evidence is discussed; resources are provided for further learning. Tools for evaluating practice are provided.
<b>ESSENTIAL THEMES</b>	

## Why do we need FINE?

- Neonatal professionals need a planned and progressive family centred developmental care curriculum that is up to date, and of trustworthy quality. That curriculum needs to be widely available in many settings.

- Early intervention programmes based on care that is sensitive to infant behaviour are evidence based and humane, they can contribute to the achievement of many desirable goals in the neonatal unit such as homeostasis, pain management, breast feeding, early discharge, healthy growth and development.
- Attunement between infant and caregiver/parent is crucial for later cognitive, social and emotional development. The ability to observe and interpret the baby's behaviour is the essence of good practice in infant care. Supporting parents to understand their baby's way of communicating throughout their time in the neonatal unit is an investment in the family's future and improves the experience of hospitalisation for infant and family.
- Delivering personal care to infants and parents is rewarding; competence in skills promoted by FINE improves job satisfaction.

## QUALITY CONTROL

The programme and course materials have been designed by NIDCAP Professionals and Trainers at NIDCAP training centres in London and the Netherlands. They oversee programme delivery and licenses, which are granted to centres that have NIDCAP trainers. Those centres will decide how and where the FINE is delivered, guiding the selection of presenters and mentors with appropriate skills and experience. Many NIDCAP training centres already run foundation courses.

## LEVEL 1:

### FOUNDATIONS IN FAMILY AND INFANT NEURODEVELOPMENTAL CARE



#### INTRODUCTION

Foundation level courses are an orientation to the scope of family and infant neurodevelopmental care and the evidence that supports it. They relate the key themes of FINE to a range of topics that are widely perceived to be within the remit of family centred and developmental care. In the UK they also reflect recommendations in the Department of Health "Toolkit for High Quality Neonatal Care" (2009) and standards in the BLISS Family Friendly Accreditation Scheme.

Foundation courses are usually organised over two days with groups of up to 40 people in a classroom setting. PowerPoint presentations and interactive workshops are delivered by experienced and highly trained neonatal professionals from medical, nursing and therapy backgrounds. The majority of presenters are NIDCAP professionals or in training with NIDCAP. A substantial binder of materials is provided for reference.

This level is essential preparation for more advanced courses.



## LEARNING OUTCOMES

Level 1 courses lay the foundations for good practice with background knowledge and orientation to practical implications. Students will

- Understand different models of developmental care, the science behind them and the evidence for their effectiveness.
- Know about the developmental outcomes for preterm infants and the neurobiological and psychosocial influences on those outcomes.
- Be aware of the changing developmental capabilities and needs of preterm and newborn infants.
- Understand why observation is the key to neurodevelopmental care and will begin to incorporate observation into their daily practice.
- Understand how the experience of having a child in neonatal care affects parents and ways in which parents can be supported to cope with this experience at different stages of their journey.
- Be aware of a range of practical strategies that can be adapted to improve the experience and outcomes for families and infants.
- Be able to use the tools provided to explore their own strengths and challenges and those of their neonatal unit.
- Identify areas in their own practice that they would like to improve and will begin to make plans to achieve these.

## WHO IS LEVEL 1 FOR?

- Level 1 is suitable for all doctors, nurses, nursery nurses, health care assistants, and allied health professionals working in any setting that treats preterm and new-born infants, including neonatal units, maternity services, transitional care units, and paediatric wards. It may also be useful for professionals working with preterm and newborn infants in the community.
- It is suitable for people who are new to neonatal care as well as experienced professionals who wish to update their knowledge. It is recommended for everyone working with neonates.
- It is essential preparation for anyone with a lead role in developmental / family centred care or anyone who is considering more advanced training.

## TOPICS AND COURSE MATERIALS

The two days include **presentations** and **interactive group workshops** that introduce the following topics:

- Models of developmental care
- Preterm and newborn brain development
- Synactive theory (Als 1982)
- Observing baby behaviour
- The parent's journey and family participation
- Management of stress and pain
  
- Behavioural states and sleep protection
- Motor development and positioning
- Sensory development and the nursery environment
- Positive Touch
- Kangaroo care

- Early feeding experience
- Adapting nursing cares and medical procedures
- Action plans

The **workshops** are a much valued part of the course as they give participants opportunities to interact with and learn from colleagues working in different disciplines and different centres.

### **COURSE ORGANISATION**

- Foundation courses may be run as a local or national course.
- They will usually consist of 14 hours of classroom teaching although in some cases bedside observations may be included for small groups.
- A handbook and resource pack is available to help course organisers.
- Certificates of attendance are issued by the host centre.

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## **LEVEL 2:**

### **PRACTICAL SKILLS FOR FAMILY and INFANT NEURODEVELOPMENTAL CARE**



#### **INTRODUCTION**

This intermediate level course follows on from Level 1: Foundations in Family and Infant Neurodevelopmental Care, to build skills and develop role models for best practice with an individualised approach to family centred developmental care. It is designed to run over 12 weeks with short assignments taking between 2 to 5 hours each week.

“Practical Skills” promotes learning through experience, thus bridging the gap between theory and practice, between caregiver, family and infant. It will have more practical impact than study days and classroom teaching.

#### **LEARNING OUTCOMES**

Students will

- Appreciate how infants communicate through their behavioural responses and how this informs good practice.
- As a result of increased self-awareness and sensitivity to the baby, be better able to model good practice and be advocates for infants and families within the neonatal unit.
- Have a better understanding of the developmental needs of preterm, and other hospitalised new-born infants and their families
- Gain confidence in sharing this knowledge with parents and colleagues, encouraging them to observe and reflect on the baby’s behaviour

- Be more aware of their own strengths and challenges as developmental care practitioners.
- Be better able to evaluate current practice on their unit and identify possibilities for change
- Be more confident and creative in their role within a multidisciplinary developmental team.

### WHO IS LEVEL 2 FOR?

- The course is suitable for all disciplines and is relevant to all services for babies needing specialised medical or nursing care.
- Practical Skills will appeal to experienced professionals who have already attended study days, conferences and short courses on developmental care and who wish to develop their own practice and become more influential in promoting family centred developmental care.
- It is essential for anyone with a lead role in developmental / family centred care
- It will prepare people who wish to progress to training at a more advanced level, such as NIDCAP, thus helping to extend the group of developmental care leaders and specialist in the future.

### CONTENT

The course is planned around 12 weeks, beginning with an introductory study day for a small group of students (Usually 6- 8 in a group) and ending with another day in which the group meet to share experience, evaluate progress and plan next steps. All course materials are in a handbook.

### TOPICS

After the group introduction in the first week, each week has a similar structure but a different topic:

**Part 1:** During weeks 2 – 6, students are encouraged to learn about baby behaviour through brief, structured observations at the bedside that are designed to fit into everyday practice. These observations follow a similar form to the NIDCAP model (Ref; ), taking one behavioural domain at a time and then reflecting on the baby's strengths and challenges

- Autonomic behaviour
- Motor behaviour
- Behavioural States\*
- Self-regulation\*
- Strengths and challenges

\*For practical reasons attention and interaction, which appear as a separate domain in synactive theory, are integrated into the weeks devoted to behavioural states and self-regulation.

**Part 2:** During weeks 7-11, the focus is on observation in the context of caregiving, and evaluation of practice.

- Stress and Pain
- Kangaroo care
- Nursing care
- Medical procedures
- Feeding

**Week 12** is part of the evaluation process.

## **LESSON PLANS**

Every week has a lesson plan that includes

- Notes about infant development
- Observation assignments with structured worksheets to complete
- Suggestions for communication with parents
- Reflective notes based on the week's experience.
- Expected competency.

Some weeks also include

- Recommended reading for the week's topic
- Checklists for evaluating practice
- Tips for good practice.

For best results we recommend that students work in pairs to share ideas and support each other's learning experience.

## **MENTORS and SUPPORT NETWORKS**

Each student is allocated an experienced mentor who will be available on their site or by email and telephone contact. Students will send their reflections to their mentor at agreed intervals and will receive written feedback. The mentors will be available to discuss any problems that arise. The cost of mentoring is included in the course fees.

Some groups may want to set up support networks, for example using apps like WhatsApp, to keep in touch and support each other.

## **HOURS**

Time required is estimated 2 – 5 hours a week over 12 weeks. Some of the assignments are very brief and can be fitted into a normal working day. During Part 2 this may be more difficult and some half or full days set aside as protected time are likely to be needed. Most students write their reflective diaries in their own time at home.

## **EVALUATION AND FEEDBACK**

At the half way point students are usually asked to submit their reflective notes, if this has not already been done, for their mentor to review and provide feedback. They also complete a mid-way evaluation form.

At the end of the course the student will

- Submit their completed workbook and reflections.
- Answer questions about a prepared case study
- Complete the course evaluation form
- Complete any "before and after" forms provided for course evaluation.
- Make a personal action plan

Each student will be given **written feedback** with personal recommendations.

A **certificate of accomplishment** will be issued by the host training centre.

## APPLICATION PROCESS

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Level 2 is run in small groups and enrolment is selective. Candidates will be asked to submit an application form that

- Describes their experience and reasons for wishing to participate,
- States the support they will get from their managers
- Gives evidence that they have participated in a Level 1 FINE course (or equivalent)
- Provides 2 referees

## WHO CAN RUN “PRACTICAL SKILLS”

Licenses to organise “Practical Skills” courses are only available to NIDCAP trainers who are in good standing with the NFI. Those trainers may decide how and where to run the courses and will select mentors who they feel have the appropriate background knowledge and skills to support students. These will usually be experienced NIDCAP professionals.

A handbook is available for course organisers.

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## RECOMMENDED READING

We suggest that these papers are read at the **beginning** of the week, **before** starting the assignments.

### Precourse

Als H, 2004, Individualised care for preterm infant. In RE Tremblay, RG Barr, R De V Peters (eds.), *Encyclopedia on Early Childhood Development* [online]. Montreal, Quebec: Centre of Excellence for Early Childhood Development: 1-7. Available at: <http://www.excellence-earlychildhood.ca/documents/AlsANGxp.pdf>.

Altimier, L, Phillips R M, 2013, The Neonatal Integrative Developmental Care Model: Seven Neuroprotective Core Measures for Family-Centered Developmental Care, *Newborn and Infant Nursing Reviews*, 13: 9-22

Cleveland LM, 2008, Parenting in the Neonatal Intensive Care Unit, *JOGNN* 37: 666-691

Flacking R, Lehtonen L, Thomson G, Axelin A, Ahlqvist S, Hall Moran V, Ewald E, Dykes F, for the SCENE group 2012, Closeness and separation in neonatal intensive care, *Acta Paediatrica* 101: 1032-1037

Westrup B, 2014, Family centred developmentally supportive care, *Neoreviews* 15:e325

### Week 1

Crathern L, 1998, Steps to reflective growth, *Journal of Neonatal Nursing*, 4(6);

White RD et al, Recommended NICU design standards and the physical environment of the NICU. 2013, *Journal of Perinatology*, 33; S2-16.

#### **Week 2**

Limperopoulos C, et al, 2008, Cerebral hemodynamic changes during intensive care of premature infants *Pediatrics* 122; e1006-e1013

#### **Week 3**

Coughlan M, Lohman MB, Gibbins S, 2012, Reliability and effectiveness of an infant positioning assessment tool to standardise developmentally supportive positioning practices in the neonatal Intensive Care Unit, *Newborn and Infant Nursing Reviews* 10(2):104-106

Sweeney and Guttierrez, 2002 Musculoskeletal implications of preterm infant positioning in the NICU. *Journal of Perinatal and Neonatal Nursing* 16(1): 58-70

#### **Week 4**

Graven SN, Browne JV, 2008, Sleep and brain development, *Newborn and Infant Nursing Reviews*, 173-179.

VandenBerg KA, 2007, State systems development in high risk new-borns in the Neonatal Intensive Care Unit, *J Perinat Neonat Nursing*, 21 (2): 130-139

#### **Week 5**

Lynn LN, Cuskelly M, O'Callaghan MJ, Gray PH, 2011, Self-regulation: A New Perspective on Learning Problems Experienced by Children Born Extremely Preterm. *Australian Journal of Educational & Developmental Psychology*. 11:1-10

#### **Week 6**

Als H, et al 2004, Early experience alters brain function and structure *Pediatrics* 113(4):846-857

Peters C L, et al, 2009, Improvement of short and long term outcomes for very low birth weight infants: Edmonton NIDCAP Trial *Pediatrics* 124(4):1009-1020

#### **Week 7**

Meek J, 2012, Options for procedural pain in newborn infants, *Archives of Diseases in Childhood Educational Practice Edition* 97:23-28

Smith GC, Gutovich J, Smyser C, Pineda R, Newnham C, Tjoeng TH, Vavasseur C, Wallendorf M, Neil J, Inder T. 2011, Neonatal intensive care unit stress is associated with brain development in preterm infants, *Annals of Neurology* 70(4):541-9.

Lundqvist P, Kleberg A, Edberg AK, Larsson BA, Hellström-Westas L, Norman E, 2014, Development and psychometric properties of the Swedish ALPS-Neo pain and stress assessment scale for new-born infants. *Acta Paediatrica*, 103(8):833-839

Vinall J, Grunau R E, 2014, Impact of repeated procedural pain-related stress in infants born very preterm, *Pediatric Research*, 75(5):584-7.

#### **Week 8**

Nyqvist KH, Anderson GC, Bergman N, Cattaneo A, Charpak N, Davanzo R, Ewald U, Ludington-Hoe S, Mendoza S, Pallás-Allonso C, Peláez JG, Sizun J, Widtröm AM; Expert Group of the International Network on Kangaroo Mother Care, 2010, State of the art and recommendations, Kangaroo mother care: application in a high tech environment, *Acta Paediatrica* 99(6):812-9.

Kledzik T, 2005, Holding the very low birth weight infant: skin-to-skin techniques, *Neonatal Network*, 24(1): 7-14

#### **Week 9**

Buehler DM, 1995 Effectiveness of individualized developmental care for low risk preterm infants. Behavioral and electrophysiologic evidence, *Pediatrics* 96 (5):923-932

**Week 10**

Kleberg A, Warren I, Norman E, Mörelius E, Berg AC, Mat-Ali E, Holm K, Fielder A, Nelson N, Hellström-Westas L. 2008, Lower stress responses after Newborn Individualized Developmental Care and Assessment Program care during eye screening examinations for retinopathy of prematurity: a randomized study. *Pediatrics*. 121(5):e1267-78

**Week 11**

Nyqvist KH, 2008, Early attainment of breast feeding competence in very preterm infants, *Acta Paediatrica*, 97:776-781

Thoyre SM, Shaker CS, Pridham KF, 2005, The Early Feeding Skills Assessment for preterm infants *Neonatal Network* 24(3):7-16

**Additional recommendations**

Bruschweiler-Stern 2009, The Neonatal Moments of Meeting – building the dialogue, strengthening the bond, *Child Adolesc Psychiatric Clin N Am* 18: 533–544

Douglas PS, Hill PS, Brodribb W. 2011, The unsettled baby: how complexity science helps. *Arch Dis Child*, 96(9):793-7.

Goldstein 2012, Developmental Care for premature infants: a state of mind, *Pediatrics*. 129(5):e1322-3.

N.B. The selection of readings may change as new papers are published.

# PRACTICAL SKILLS FOR FAMILY CENTRED DEVELOPMENTAL CARE

## LEVEL 2

### Family Infant Neurodevelopmental Education (FINE)



# Pre-course Work

Before you start this course you will be sent a pack with information about arrangements for the course and some recommended reading. We will also send you forms to complete that are part of the pre- and post- course assessment. Please complete these and bring them to your first meeting with the course leader.

## Contacts

NIDCAP Training Centre with license:

Course Leader:

Your mentor:



## Infant Stressor Scale

- This scale asks you to record your perceived levels of stress for the baby, and for yourself as caregiver or observer, during procedures.
- Score each procedure on a scale of 1 to 5 with 5 being the most stressful.
- You will score this before you begin the course. Please bring the completed sheet with you to your introduction day.
- You will also be asked to score it at the end of the course.

Name:

Professional role:

Years of experience with neonates:

Hospital:

Pre-course  Date:

Or

Post-course  Date

Adapted from Newnham CA, Inder TE, & Milgrom J, 2009. Measuring preterm cumulative stressors within the NICU: the Neonatal Infant Stressor Scale. *Early Human Development*, 85(9), 549–55.

Infant Stressor Scale	Stress level for infant					Stress level for you.				
	1	2	3	4	5	1	2	3	4	5
<b>Nursing</b>										
Nappy change										
Position change										
Removal from incubator/bed (wrapped)										
Removal from incubator/bed (unwrapped)										
Mouth care										
Eye cleaning										
General wash										
Being weighed										
Suctioning nose and mouth										
Bath (wrapped)										
Bath (unwrapped)										
<b>Peripheral venous access</b>										
Insertion of IV										
Multiple attempts at insertion										
Removal of IV										
IV flushing										
<b>Peripheral arterial access</b>										
Insertion of IA catheter										
Multiple attempts at insertion										
Removal of IA catheter										
Sampling e.g. blood gas										
<b>Central vascular access</b>										
Insertion of UAC/UVC										
Multiple attempts at insertion										
Removal of UAC/UVC										
Insertion of percutaneous long line										
<b>Ventilation</b>										
Intubation										
Insertion of Nasal CPAP tube										
Receiving Nasal CPAP										
Suctioning of ETT tube										
<b>Nutrition</b>										
Insertion of NGT										
Stomach aspiration via NGT										
Intermittent NGT										
Gavage feed										
Bottle feed										
Cup feed										
Breast feed										
<b>Medical procedures</b>										
Insertion of chest drain										
Lumbar puncture										
Heelsticks										
Venepuncture										
ROP screening										
<b>Radiology</b>										
Cardiac echocardiogram										
ECG										
Ultrasound										
CT/MRI										
X-ray										

# Week 1.

## Introduction.

This week is your introduction to the PRACTICAL SKILLS FOR FAMILY CENTRED DEVELOPMENTAL CARE: FINE level 2.

You will meet your course leader and mentor. A lecture will refresh the knowledge you gained in your FOUNDATION COURSE: FINE Level 1.

Your course leader will guide you through the handbook to familiarise you with the structure of the course, the assignments and observation sheets. You will start to observe babies with your course leader, either in the neonatal unit or on videos. This introduction will also emphasise Active Listening and Reflection, both of which are very important parts of the course.

Your course leader will show you how to use site assessment checklists that will help you to identify strengths, challenges and potential for change in the way developmental care is practiced in your unit.

The assignments in Part 1 are designed to follow the sequence as set out. Part 2 can be done in any order.

### Learning Objectives:

- You will understand the objectives and structure of the course and will be able to plan a timetable for your own study
- You will understand the key themes of the programme which are: development observation, family, reflection, system change and evidence.

### 1.1. DEVELOPMENT

The developmental model that has been adapted for this course is the synactive organisation of behavioural development (Als 1982).

Observing babies and thinking about the significance of their behaviour is an essential part of good practice; this means observing the organization of and complex interplay between:

#### SUB-SYSTEMS

- Autonomic (Week 2)
- Motor (Week 3)
- State (Week 4)
- Attention and Interaction (incorporated into weeks 4 and 5).

### 1.2 OBSERVATION.

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With your course leader you will start to observe babies, either in the neonatal unit or on videos.

You will need a clipboard and pencil for your weekly observation assignments.

NB. When you are observing babies try not to disturb them in any way. Keep the baby covered as you find him. Be aware of how your presence at the bedside can affect the baby. Check that caregivers present at the time are comfortable about you observing the baby; explain what you are doing and show them the observation sheets.

“The behaviour of the infant is its primary way to communicate” (H. Als)

### 1.3 FAMILY

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When observing a baby in the presence of parents ask them for their thoughts about the baby. Listening to the parent is a very important part of what we do. Read the notes on ACTIVE LISTENING on page 23.

### 1.4 REFLECTIONS

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Reflections are an essential part of this program. They will help you to learn from your experience. You will send your reflections to your mentor who will treat them as confidential. They help your mentors to understand how you are getting on so that they can guide and support you. Read the notes on reflection on page 24 for tips on how to write reflective notes.

### 1.5. SYSTEMS CHANGE

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This course promotes an individualised approach that is different to generic models of developmental care.

Generic-deconstructed		Individualized-systemic
Same for all		Individualized
Separate components		Complex and interactive
Protocol/guideline/task orientated		Dynamic/reflective/ relationship based
Benchmarks and audits		Observation and feedback
Requires information and commitment		Requires skill and support
Focus on physical environment		Focus on social environment

When observing in the presence of professionals who care for the baby ask them for their thoughts about the baby and encourage them to look at the baby and reflect on what they see.

The lesson plans for most weeks include SITE ASSESSMENT checklists that you can use to evaluate strengths and challenges in your own unit, and to make action plans. Read the instructions on page 26 and complete the Parent Participation checklist on page 27.

## 1.6. EVIDENCE

### Recommended reading

Crathern L, 1998, Steps to reflective growth, Journal of Neonatal Nursing, 4(6);

White RD et al, Recommended NICU design standards and the physical environment of the NICU. 2013, Journal of Perinatology (33); S2-16.

Als H 1982, Towards a synactive theory of development; promise for the assessment and support of infant individuality. Infant Mental Health Journal 3(4):229-243

## ACTIVE LISTENING

Listening to parents is a very important part of what we do. Active listening helps them to understand their baby, their own feelings about their baby and becoming a parent. It helps us to reflect on our perception of the family and the baby.

Considerations for active listening.

1. You need to have an understanding of infant behaviour that enables you to observe and differentiate the autonomic, motor, state, attention and self-regulatory behaviours, and see the way they impact on each other, and how the baby responds to different kinds of stimulation and

soothing. You also need to know enough about infant development to be able to pick out behaviours that are atypical and that might indicate problems.

2. With this knowledge you can compare your own perceptions of the baby with the parent's perceptions and consider their attributions of meaning to their baby's behaviour.
3. You need to have the desire to listen to parents and to create conditions in which parents can listen to themselves. Sometimes you just need to be "present", to be listening attentively and showing interest in the parent's feelings to help them develop an intuitive sense of being a parent.
4. Listen to yourself and reflect on your own feelings and perceptions of the baby and parents.
5. Think of yourself as an active collaborator with the parents rather than as an authority. This is their baby; your attitude should be one of watching together as equals, sharing thoughts and observations.

Adapted from Boukydis, Z, 2012, **Collaborative Consultation**. Paul Brookes Publishing

## REFLECTION

Each week we will ask you to reflect on your experience. We will provide you with some questions to help you get started.

Reflection is an essential part of developmental care. Developmental care is not about rules and protocols but depends on thoughtful observation and feedback from the infant, the family and colleagues. This becomes a continuous learning process.

A reflective diary/journal is not a list of events but a personal record of your experience, your own actions and behaviour.

Maintaining a reflective diary helps you to:

- Synthesis knowledge and ideas
- Develop critical thinking
- Structure your thoughts
- Step back and put experiences and developments into perspective

We all need to be aware of and take responsibility for the atmosphere we are creating around us with our personal energy, in the room and in the relationships we have with our co-workers, parents and babies.

In your reflections include your thoughts about supporting team members and parents, helping them to see the baby, and working collaboratively.

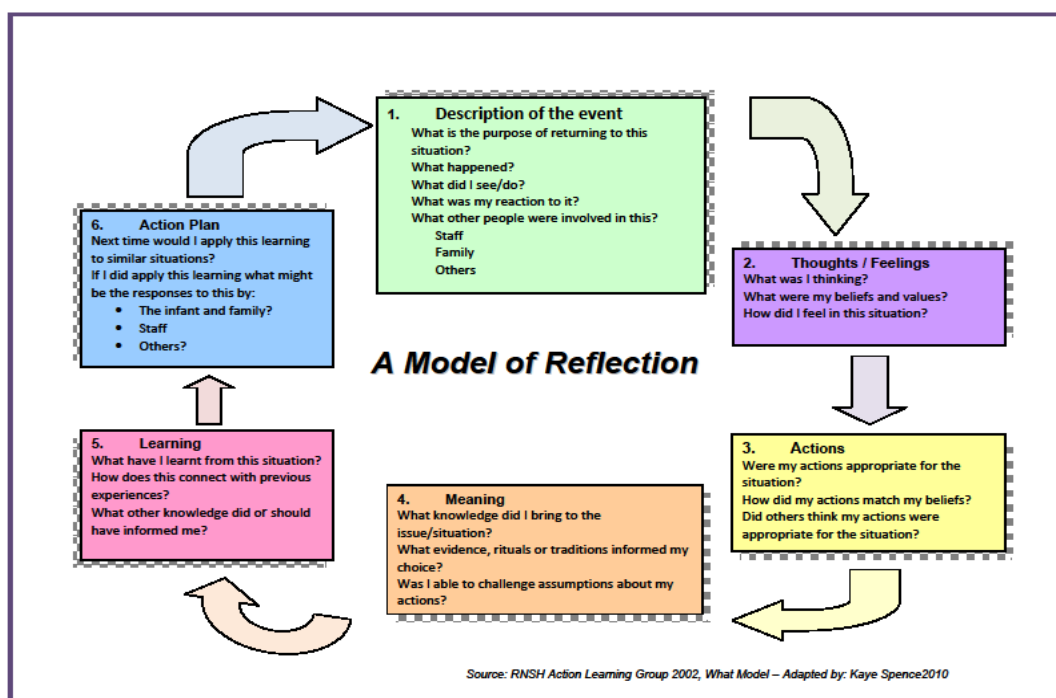
Tips for writing reflective notes.



1. Start with a brief summary of the events that you experienced. What happened? Who was involved?
2. Describe what you found difficult or rewarding. Record your own thoughts, ideas, responses and reactions. What did you feel?
3. What was the effect on parents? On the child? On colleagues?
4. What was successful and what was not?
5. What went well and what could be better?
6. How would you approach a similar situation in the future?
7. You should use whatever style you are comfortable with as long as you write in the first person (I) form.
8. Reflect on problematic and success stories!!
9. What have you learnt from this experience?

In our professional relationships we use skills that we have learnt in our earliest personal relationships. Sometimes we feel the need to put up barriers, to keep the feelings and emotions that we perceive as personal, away from our professional life. We need to be aware of this and recognise that our emotional life is an important part of our humanity, of our ability to communicate and to relate to others.

**NB:** Send your weekly reflections to your mentor at agreed intervals; this may be weekly, fortnightly or at the half way point, preferably electronically.



(Reproduced with permission from Kaye Spence)

# SITE ASSESSMENT CHECKLISTS

In some weeks you will be asked to complete a check list to assess an aspect of developmental care in your nursery. These checklists help you to identify

- \* Strengths
- \* Challenges
- \* Potential for change

in the way developmental care is practiced on your unit. The emphasis is on caregiving, parent participation, staff support and team values.

Strengths. Each statement is a positive aspect of developmental care. In this column score each statement according to how true it is of your nursery

- score **2** if you believe the statement truly reflects your nursery.
- score **1** if you think it is partly true.
- score **0** if you think it is not at all true.

Change. In this column score each statement according to how easy or difficult it would be to make an improvement

- score **2** if you can think it is possible to change your nursery to agree with the statement
- score **1** if you think it is possible to partly change your nursery
- score **0** if you think it is not possible to change at all

Timeline. In this column make an estimate of how long you think it will take to the change.

Some of the features listed will be irrelevant or inappropriate to your nursery and no nursery is likely to be able to meet all the positive criteria. Use the checklists to identify areas of potential change, suggest timelines and monitor your progress.

At the end of each checklist you can add up your scores and convert them to percentages that can be represented in chart form to give you a visual image of how your unit is doing.

For a comprehensive and detailed evaluation of family centred developmental care consider the NIDCAP Nursery Certification Program (NNCP). Information is available at [www.nidcap.org](http://www.nidcap.org).

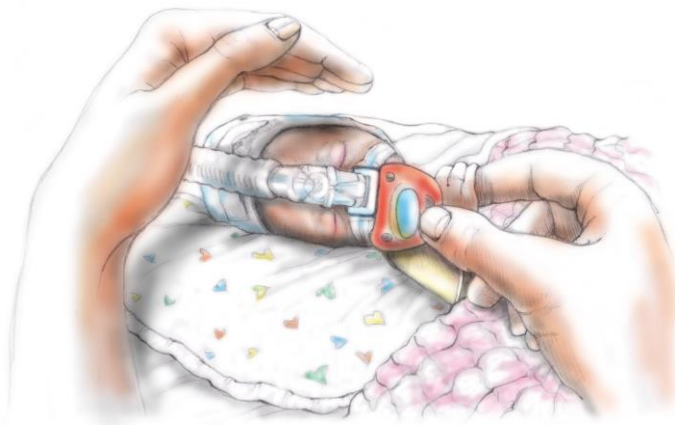
## Week 1: SITE ASSESSMENT

	<b>PARENT PARTICIPATION</b>	Strength	Change	Time
a.	Parents are acknowledged as the baby's most important caregiver from the beginning			
b.	Parents are consulted and encouraged to contribute to care plans and goal setting			
c.	Parents are welcomed to attend and participate during ward rounds			
d.	Parents have 24 hour access including during ward rounds and handover			
e.	Parents are shown how to wash hands properly			
f.	Staff understands how important it is for parents to feel welcome to watch and be with their baby for as long as they like.			
g.	Parents' involvement with their baby does not depend on who is on duty			
h.	Parents are encouraged to provide comforting touch for their baby from the first day if they are ready, with appropriate guidance			
i.	Kangaroo care is facilitated from the first day if parents and baby are ready.			
j.	Parents are given the opportunity to learn about their baby's behaviour and how to respond appropriately to the baby's cues			
k.	Parents are offered the opportunity to stay while uncomfortable procedures (non-urgent) are performed on their baby			
l.	Parents are encouraged to support their baby during uncomfortable procedures			
m.	Parents are encourage to be present and to help with weighing of their baby			
n.	Parents are encouraged to clean their baby's mouth			
o.	Parents are encouraged to do tube feeds (with supervision)			
p.	There are opportunities for family celebrations, customs etc			
q.	Bathing is reserved for parents and the first bath is always planned as a family event			
r.	Simulations with dolls are used to train staff e.g. for wrapped baths, so that demonstration on babies are avoided when guiding parents.			
s.	There is a suggestion box or book with feedback about action taken			
	Your score			
	Max score	38		
	Percentage: $100 \div 36 \times \text{your score}$			

Adapted from Warren I, Bond C, 1999 and 2004, A Guide to Infant Development in the Newborn Nursery.

## Week 2.

# AUTONOMIC SUB-SYSTEM



The human body is a complex system that continuously strives to adapt to the demands made on it by the environment, and the roles we have to play. When everything is going well we are hardly aware of breathing, circulation, and digestive functions, so smoothly do they operate. When our system is stressed it responds physiologically in various ways to protect itself.

When a baby is admitted to the neonatal unit the first goal is usually to establish stability, working towards effective breathing, digestion, elimination, circulation and temperature regulation. This stability is important for protecting the brain. Research shows that the way we care for babies affects all of these functions. By watching the baby's behaviour in the context of the care giving (handling, position, timing, environment) we can provide favourable conditions for physiological stability and brain development.

This week is all about observing and learning the baby's behaviour in the autonomic subsystem. Observation of the baby's breathing, colour and signs of autonomic imbalance, such as twitchy movements, inform us about the baby's need for assistance.

Knowing and understanding autonomic behaviours helps you to be proactive in your support for the baby. You can anticipate the baby's reactions and plan daily care and medical procedures to maximise stability.

You will be able to share your observations with parents and guide them to anticipate the autonomic behaviour of their baby.

### Competency

- Identifies, and can describe, patterns of respiration, breathing and other autonomic functions from direct observation of the baby.
- Begins to feel confident about engaging others in conversations that explore the infant's behavioural responses.

**Colour:** Observing colour can be challenging, especially when babies are shaded. It gets easier with practice. Newborn babies are a reddish-pink colour for the first week or two after birth. Natural skin pigmentation does not mature for several weeks. Medical conditions may be reflected in skin colour, for example the yellow tones of jaundice, which is very common in new babies; pallor may be due to anaemia or sepsis; blotchiness may indicate low body temperature. Look for changes that tell you that the baby is becoming more stressed, for example deep flushed colour, pale or dusky (blue-grey) areas, mottled pattern. Changes may be quite rapid and subtle but often tell you, before the monitors do, that the baby is having difficulty keeping everything in balance. As the baby becomes more organised skin tones will be more even with pink undertones.

**Breathing:** At first the baby may make very intermittent efforts to breathe. Gradually spontaneous breathing will become more regular, effective, rhythmic, and comfortable. “Periodic breathing” is common in preterm babies with many pauses, often followed by fast “catch up” breathing. Regularity of breathing is also affected by behavioural state (see week 4). Medications like caffeine may be given to stimulate breathing. Look for changes such as increased frequency or length of pauses, more rapid shallow breathing, more laboured breaths with conspicuous abdominal movement and recession, or gasping breath, all of which may tell you the baby is working hard to achieve balance. Slower, regular, less effortful breathing may tell you the baby is becoming more organised. Yawning may be a sign of stress.

**Digestion:** The immature gut of the preterm baby makes digestion a challenge. Gastric emptying and gut activity are slow and babies often appear to be straining to achieve bowel movements. Gastro-oesophageal reflux (GOR) is extremely common in preterm babies and may be observed in facial expressions of distaste, gulping and gagging, dips in heart beat or oxygen saturation, positing and vomiting. Passing of bowel movements may be precipitated by stress. Look for signs of digestive discomfort, which may suggest that the baby needs adjustments to his feeding regime as well as more supportive caregiving.

**Involuntary movements;** twitches of face, limbs or body, tremors, startles and hiccoughs may also be signs of stress that disappear as the baby becomes more stable and organised.

**Heart beat and oxygen saturations:** You may be surprised by the way that visible signs give you a more vivid and prompt picture of the baby’s reactions than the monitor displays. Nevertheless it is helpful to check the heart rate and oxygen saturations from the monitor. Preterm babies have a faster heart beat than term babies; at 24 – 28 weeks it is likely to be 140-170 beats a minute while at term 90 -130 beats a minute is more usual. Medications such as caffeine tend to accelerate heartbeat.

These manifestations of autonomic stability (organisation) or instability (disorganisation) tell us when a baby may benefit from changes in the way care is given and whether those changes have been successful. When a baby is premature, sick or stressed his behaviour will appear more disorganised; as he gets stronger and matures, or receives the support he needs his behaviour will look more organised; you will notice increasing competence in keeping the autonomic sub-system in balance and returning to homeostasis after periods of stress.

	Signs of vulnerability and instability	Signs of strength and stability
Breathing;	Fast, sometimes shallow; labored; recession; irregular; pauses; big efforts to restart breathing.	Gentle, steady breathing pattern.
Colour	Pale or dusky areas; mottled or webbed patterns; flushed.	Pink undertones
Movement	Twitches, tremors, hiccoughs, common	Infrequent
Digestion	BM grunt, strain, posits (spit up), gags.	Baby appears to digest food without discomfort.

## 2.2. OBSERVATION.

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2.2.1. For this bedside observation use Observation Sheet AUTONOMIC CUES (A). Observe 5 babies for 2 minutes and record the autonomic signs that you saw.

2.2.2. For this bedside observation use Observation Sheet AUTONOMIC CUES (B). Observe and record autonomic signs before and after a caregiving event.

*Alternative observation sheets provided.*

## 2.3. FAMILY

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You will look for opportunities to explain to parents what you are doing, to ask parents what they have noticed about their baby and include those observations in your reflective notes.

## 2.4. REFLECTIONS

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This week was your first week to do observations in the nursery and you observed autonomic signs. Perhaps you were able to ask your colleagues or parents about their observations.

Describe your feelings as you observed babies. Was it a new experience for you to stand and just observe a baby? Did you take your time or did you feel rushed or distracted? Did you notice how the environment affected the baby's physiological responses and if so how did you feel about this? Did you feel comfortable observing babies if there were other people present? What did you think that they thought about this? Did you discuss your observations with anyone else and if so how did that go?

## 2.5. SYSTEM CHANGE.

Encourage colleagues to observe with you or tell you what they have noticed.

In your reflections comment on how you perceived the baby's response to the environment.

## 2.6. EVIDENCE

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Limperopoulos 2008, Cerebral haemodynamic changes during intensive care of preterm infants  
*Pediatrics* 122;e1006-e1013

Week 2: AUTONOMIC SUB-SYSTEM OBSERVATION (A) (Observe 5 babies for approximately two minutes each. (one column for each baby))

Each column represents 2 minutes of observation time with one baby.					
<b>Breathing:</b> more than one category may be marked					
Rate per minute					Count for 30 seconds and double
Regular					Steady breath to breath interval
Irregular					Variable breath to breath interval
Slow					Less than 40 bpm equivalent
Fast					More than 60 bpm equivalent
Pause					Pauses breathing for 2 secs. or more
Sigh					A longer and deeper breath
Gasp					A big, laborious in-breath
Hiccough					One of several repetitive sharp inspiratory sounds with spasm of the glottis and diaphragm
Sounds					Whimpering like a mild fuss
<i>Cough</i>					A harsh sound when bringing air or harmful matter from the lungs or throat
<b>Colour:</b> more than one colour category may be marked. Colour may be patchy and fluctuating.					
Jaundiced					Yellow tones of skin. May also be seen in eyes.
Pink					Good perfusion over face, body and limbs
Pale					White or sallow areas e.g. nose, around mouth, fingers, overall
Red					Flushed, reddened colour
Webbed					Pattern of surface blood vessels visible
<i>Mottled</i>					<i>Blotchy pattern of skin (often noticed when baby is cold)</i>
<i>Dusky</i>					<i>Grey-blue tones e.g. often around mouth or eyes. Flushed and dusky gives purplish colour</i>
<b>Movement</b>					
Tremor					Trembling or quivering of any part or whole of body. This is a repetitive movement.
Twitch face					Twitches are small isolated muscle contractions that can occur in any part of the body
Twitch Body					
Twitch limbs					
Startle					Sudden large jumpy movement of arms or legs or whole body.
<b>Digestion</b>					
Strain/ BM grunt					Straining as if trying to pass a bowel movement. May grunt or pass gas.
Gagging					Gulping or brief appearance of choking. Mouth may open.
Burp					The infant brings up air in an expiratory burst
Posit / spit up/ vomit					Any brining up of feeding or saliva; more than a drool is required.
<b>Monitor readings</b>					
HR					
O2					
Any other signs that you observed					

Adapted from the NIDCAP Observation sheet and Manual for Naturalistic Observation, 2006, NFI



Week 2: AUTONOMIC SUB-SYSTEM OBSERVATION (B) Observe a baby just before, during and just after a caregiving event and record the autonomic signs you observed.

	Before	During	After	
<b>Breathing</b>				
Rate per minute				Count for 30 seconds and double
Regular				Steady breath to breath interval
Irregular				Variable breath to breath interval
Slow				Less than 40 bpm equivalent
Fast				More than 60 bpm equivalent
Pause				Pauses breathing for 2 secs. or more
Sigh				A longer and deeper breath
Gasp				A big, laborious in-breath
Hiccough				One of several repetitive sharp inspiratory sounds with spasm of the glottis and diaphragm
Sounds				Whimpering like a mild fuss
<i>Cough</i>				A harsh sound when bringing air or harmful matter from the lungs or throat
<b>Colour</b>				
Jaundiced				Yellow tones of skin. May also be seen in eyes.
Pink				Good perfusion over face, body and limbs
Pale				White or sallow areas e.g. nose, around mouth, fingers, overall
Red				Flushed, reddened colour
Webbed				Pattern of surface blood vessels visible
<i>Mottled</i>				<i>Blotchy pattern of skin (often noticed when baby is cold)</i>
<i>Dusky</i>				<i>Grey-blue tones e.g. often around mouth or eyes. Flushed and dusky gives purplish colour</i>
<b>Movement</b>				
Tremor				Trembling or quivering of any part or whole of body. This is a repetitive movement.
Twitch face				Twitches are small isolated muscle contractions that can occur in any part of the body
Twitch Body				
Twitch limbs				
Startle				Sudden large jumpy movement of arms or legs or whole body.
<b>Digestion</b>				
Strain/ BM grunt				Straining as if trying to pass a bowel movement. May grunt or pass gas.
Gagging				Gulping or brief appearance of choking. Mouth may open.
Burp				The infant brings up air in an expiratory burst
Posit / spit up/ vomit				Any bringin up of feeding or saliva; more than a drool is required.
HR				
O2				
Any other signs that you observed				

Week 2: ALTERNATIVE AUTONOMIC SUBSYSTEM OBSERVATION SHEET.

To be used if NFI do not accept use of A

<b>Baby 1</b>	Observe for 2 minutes and record which autonomic signs you saw.	
<b>Breathing</b>	e.g. bpm, regular, irregular, laboured, shallow, fast, slow, gasp, yawn, (sneeze)	
<b>Heartbeat</b>	e.g. bpm, peaks, dips, fast, slow,	
<b>Oxygenation</b>	Range, peaks and dips.	
<b>Colour</b>	e.g. red, pink, pale, flushed, dusky, jaundiced, blotchy	
<b>Movements</b>	e.g. twitches, tremors, startles, hiccoughs	
<b>Digestion</b>	e.g. straining, distasteful expression, possetting or vomiting, bowel movement	
<b>Did you think that anything going on around the baby affected these signs?</b>		

## Week 3

# MOTOR SUB-SYSTEM

This week you will learn about the behaviour you can observe in the motor subsystem.

Observing the muscle tone, facial expressions, movements seen in the extremities and trunk tell a lot of about the strengths and challenges of the baby. Knowing and understanding these behaviours helps you to anticipate the baby's reactions and support the baby to maximize his motor stability and development.



Positioning an infant comfortably with appropriate support is a very important part of our work. The baby's position should support his muscle tone; efforts to breath; blood flow; digestion; regulation of body temperature; and energy consumption. Positioning also plays a very important role in supporting the baby's efforts to self-regulate, for example by tucking in limbs, bringing hands to face, grasping and holding on, bracing feet against boundaries or clasping feet or hands together, and thus to achieve restful sleep and quiet alertness.

This week the Positioning Comfort Scale will help you to assess the position of the baby. Is the baby comfortable or do you have to adjust his position in order to support self-regulation.

### Competencies

- Identifies and describes how the motor sub-system indicates comfort and discomfort.
- Appreciates the use of positioning supports to achieve healthy, functional positions.

### 3.1. DEVELOPMENT

The level of tension or exhaustion that we feel is expressed through muscle tone and movement co-ordination. Very preterm babies have little muscle bulk and tend to express themselves with fluctuations of tone and disorganised movement patterns. They make facial expressions and gestures that are common to everyone, but unlike adults they cannot easily inhibit these; under stress movements become more uncoordinated and abrupt, or occur in exhausting cycles.

**3.1.1. Muscle tone:** Muscle tone defines the strength or tension of the muscle. The muscle tone of preterm babies differs to that of babies born at term because it has had less time to develop in the womb, thus normal muscle tone for preterm babies is lower than that of term babies. Gravity, illness, pain and fatigue will influence muscle tone and the preterm baby's ability to adjust his posture or movement patterns.

When tired tone may drop and the baby will seem to take up the shape of the surface he is resting on. Loss of tone is usually first seen in the face, shoulders and arms; the legs may retain quite modulated tone while the arms are slack. Low tone may also affect the muscles that the baby uses for breathing, making this more of an effort.

When tone increases this is often seen in stiffly extended movements of the fingers, toes, limbs or trunk, clenched fists and toes. Increased tone often appears when a baby is in discomfort; muscles and posture look stiff or tight and there is increased resistance to passive movement. Increased tone may first be noticed in the feet

Modulated tone is firm and elastic with flexed posture showing the baby's growing maturity, strength and comfort. With modulated tone he can maintain his own shape against gravity and can keep his limbs tucked in close to his body where he can use his hands and feet to brace, and grasp. Without this modulation the preterm infants' movements are often jerky.

During the preterm period muscle tone develops in a caudal-cephalic sequence (i.e. legs have more tone than arms), and distal to proximal (e.g. hands / feet show more tone than the trunk).

Very preterm babies need high levels of positioning support to encourage relaxed, modulated tone and to help them to conserve energy. If they are poorly supported for prolonged periods they may later have developmental problems arising from muscle shortening. As preterm babies mature and become stronger they become more able to make themselves comfortable with limbs tucked in. Observations of the baby's tone helps us to determine what sort of support will be helpful.

Signs of tension (high tone)	Signs of fatigue (low tone)	Signs of strength and comfort (modulated tone)
Outstretched limbs, fingers and toes	Appears sunk into the bedding	Arms and legs folded in towards body
Arching head and back	jerky or– flailing movements	Muscle tone firm but not tight,
Strong resistance to passive movement	No resistance to passive movement	Moderate resistance to passive movement.

Gestational age weeks	Resting posture tone	Active movement
27-28	Generalized hypotonia	Tremulous, jerky, random, involves entire extremity
29	Able to assume a variety of postures	Primarily in lower extremities, remains jerky with flailing, reflexive reaction to handling
30	Beginning flexion in thighs	More purposeful, controlled movement of extremity although still involves whole extremity
31	Thigh flexion with increased tone in lower extremities	Flexes arms and legs, tremors commonly seen, not smoothly coordinated
32	Flexes thighs with emerging hip flexion	Increased activity with smoother, more purposeful with increased quality
34	Hip flexion and abduction	Much more time in alert state with active movement. Reciprocal leg kicking, trunk flexion, progressively smoother and more purposeful
35	Maintenance of flexed posture initially in prone	Movements less random. Quiet alert state maintained. Eye and head movement purposeful.
36	Flexor tone over extensor tone in trunk and extremities, variety of postures assumed	Active with any movements available
37-40	Arms and legs in flexed position	Primitive reflexes complete, movement is controlled, less random, volitional.

Adapted from: Allen, 1990; Creger, 1989 (permission pending)

**3.1.2. Movement patterns:** The foetus and preterm baby generally has a varied repertoire of movements that are non-specific. At first preterm babies' movements tend to be "all or nothing", in other words when the baby is disturbed his whole body reacts. On becoming distressed movements may become abrupt, cyclical, and jittery with much extension. As they become more maturely organised movements become increasingly graceful, smoother and more discrete, with more flexion and less extension; they can reach comfortable resting positions, ready for sleep and quiet alertness with less external support.

**Gestures:** Preterm babies have a repertoire of gestures that give us clues about how they are feeling. Some of these gestures such as pushing out with the legs to press feet against a surface or clutching and holding on, are stabilising activities that are familiar to all of us. Folding the arms in and tucking up knees, clasping hands together, resting one foot against the other foot or leg, and bringing hands to rest on the face or head are other examples. When a baby is disturbed signs such as hands wide open or closed in a tight fist, or arms and legs thrust into the air, may show you his distress. It is always important to look at these signs in the context of everything that is going on to get a picture of what the baby is telling you.

Stabilising gestures (see also week 5, self-regulation)	Gestures that are signs of vulnerability /instability.
Pressing feet against a surface	Arms or legs extended and raised off the bed
Tucking in arms and legs	Fingers or toes stretched wide
Hands resting on face or head	Tight fist
Hands clasped together	Clenched toes

3.1. SUMMARY		
	Signs of vulnerability	Signs of stability
Muscle tone	Flaccid or tense tone.	Modulated tone.
Posture	Predominantly extended if not supported	Flexion predominates.
Movement patterns:	Predominant extension; tend to be wide, abrupt and flailing. Repetitive cycles.	Smooth, graceful movements with gradual onset. Many hand to face movements. More active flexion.
Facial expressions:	Gaping face, grimace.	Frown, smile, speech movements, perky alert expression.

**Reflexes:** automatic, reflexive motor patterns that are observed in the preterm period include:

- **Grasp reflex.** Infant closes hand when palm is touched.
- **Asymmetric Tonic Neck Reflex (ATNR).** Arm and leg extend in the direction baby faces when head is turned.
- **Rooting.** Baby moves lips and opens mouth when touched around the mouth, as if searching for breast.
- **Moro reflex.** Arms and legs extend and then flex when head drops backwards.

**3.1.3. Facial expressions:** Facial expressions can tell us how a baby is feeling. Facial expressions, for example, widely used in pain scales for preterm and newborn infants which commonly feature grimacing with bulging brow, eyes tightly squeezed shut and a deep groove between corner of mouth and nose. Sometimes babies wrinkle their brow or frown as if trying to concentrate, even when drowsy. When awake the preterm baby’s expression often looks glazed or alarmed, rather than the brightly focused gaze he will achieve as he becomes more organized and able to process sensory inputs. Early smiles during active sleep are probably due to random brain activity but by 34 weeks drowsy smiles begin to have some social component, at least they seem to be more frequent in response to a parent’s voice. These are a step towards the true social smiles that usually appear in the first six weeks after term birth.

During this period babies often make mouth movements as if imitating speech.

Facial expressions – signs of stability; baby comfortable or ready for interaction	Facial expressions – signs of vulnerability, distress or fatigue
Relaxed face	Drooping cheeks and mouth Grimace
Shiny alert eyes	Glazed or panicky expression
Frowning or raising eyebrows with wrinkled brow	Looking away
Soft smiles	Twitchy smiles

### 3.1.4. FACILITATING MOTOR SUB-SYSTEM DEVELOPMENT:

1. Positions that support effective breathing.
2. Positions that encourage normal development patterns and avoid secondary disabilities and malformations (e.g. head molding, hip abduction, shoulder retraction).
3. Opportunities to move and strengthen muscles.
4. Facilitation of smooth movements and self-regulatory activity with opportunities to achieve flexed, tucked posture, to brace or clasp feet, to clasp hands, grasp and hold on, or bring hands to mouth, face or head.

### 3.2. OBSERVATION.

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3.2.1 You will use the MOTOR OBSERVATION SHEET A. to record facial expression, tone and movements in 5 babies observed for short periods (2 minutes or more).

*Alternative sheet B provided if NFI do not wish to give permission*

3.2.2 The way we support the baby can make a great difference to his comfort, his physiological stability, his sleep and ability to reach quiet alertness. The position can help the baby to be successful with stabilising gestures, and to retain or regain energy levels. You will use the POSITIONING COMFORT SCALE to assess positioning comfort with three babies.

3.2.3. You will use the POSITIONING COMFORT SCALE to assess one baby's comfort before and after caregiving.

### 3.3 FAMILY PARTICIPATION

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Look for opportunities to ask parents for their observations about their baby and include these in your reflective notes.

### 3.4. REFLECTIONS

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This week you observed the babies' motor signs and how that related to their comfort.

Describe how you felt when you saw that a baby was not completely comfortable. How did you feel when you saw a baby that looked very comfortable and sweet? Did you ask parents or

colleagues about the baby's preferred positions? Did you feel that you could discuss your observations without sounding as if you were making a judgement? How do you think staff or colleagues felt about you doing the Positioning Comfort Scale?

### 3.5. SYSTEMS CHANGE

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3.5.1 You will complete the SITE ASSESSEMENT POSITIONING AND BEDDING checklist on page 0000. Refer to page 000 for instructions about scoring.

3.5.2 Take a look at the Practical Tip Sheet MAKING A NEST. On page 0000

Encourage colleagues to observe with you and ask for their observations.

### 3.6. EVIDENCE

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- Coughlan et al 2010, Reliability and effectiveness of an infant positioning assessment tool to standardise developmentally supportive positioning practices in the Neonatal Intensive Care Unit, *Journal of Perinatal and Neonatal Nursing* 16(1): 58-70
- Sweeney and Gutierrez 2002 Musculoskeletal implications of preterm infant positioning in the NICU. *Journal of Perinatal and Neonatal Nursing* 16 (1): 58-70



## Week 3: MOTOR SUB-SYSTEM OBSERVATION SHEET (check 5 babies )

<b>1. Position of baby</b>					
Prone					Lies on front / tummy: mark facing L or R or midline
Side					Baby lies on one side, mark L or R
Supine					Baby lies on back: mark facing L or R or midline
<b>2. Muscle tone</b>					
Arms					F = flaccid, limp T = tonic, stiff M=modulated
Legs					F = flaccid, often with splayed hips. T = tonic, looks stiff M=modulated
<b>3. Quality of movements</b>					
Smooth					Graceful movements
<i>Jittery</i>					<i>Shaky, jerky or tremulous movements</i>
<i>Restless</i>					<i>Little fidgeting movement e.g. feet and hands</i>
<b>4. Facial expressions and activity</b>					
Grimace					Facial extension, moth stretched square; cry face
Tongue extension					Sticks out tongue; as if disgusted; or tasting/licking lips
<i>Wrinkled brow</i>					<i>Stressed expression or appears to make ffort to open eyes</i>
Frown					Brows drawn in – concentrated expression
Smile					Upturned corners of mouth, not twitchy.
Mouth movements					Opening and closing e.g. with distaste or gulp
<i>Rooting / suck search</i>					Moving mouth as if searching to suck
<i>Suck(non-nutritive)</i>					<i>On tubes, soother, finger etc. short quick bursts</i>
<i>Sucking(nutritive)</i>					<i>On teat or nipple</i>
Flaccid gape face					Droopy cheeks, mouth hangs open.
<b>5. Movements and gestures: arms, hands, fingers</b>					
Position					F = flexion E = extension
Salute					Raises extended arm off bed
Airplane arms					Spreads arms out to side
Splayed fingers					Spreads fingers wide
<i>Clenched fist</i>					<i>Tightly fistted hand</i>
<i>Softly flexed</i>					<i>Softly closed hand</i>
Hand on face					Hand resting on face or head
Hands clasped					Hands together; holds hand/arm. Twines fingers.
Hand to mouth					Brings hands to mouth. May insert to suck
<i>Clutch / grasp</i>					Appears to be trying to find something to grasp
Holding on					Holds onto something e.g. finger, bedding, tubing.
<b>6. Movements and gestures: legs, feet, toes</b>					
Position					E = extension F = flexion
Leg bracing					Stretches leg(s) to find surface to press feet against
Sit on air					Stretches and lifts leg(s) off bed
Foot clasp					Brings feet together; one foot rests against other leg
<i>Toes splayed</i>					<i>Toes widely spread</i>
<i>Toes clenched</i>					<i>Toes tightly curled</i>
<b>7. Movements: trunk</b>					
Position					E= extended, arched. F = flexed, tucked. S = straight
<i>Squirm/wriggle</i>					<i>Diffuse movements</i>
Stretch/drown					Big stretches followed by tucking usually with pauses in breathing and colour changes. Struggling.

Adapted from the NIDCAP Observation sheet and Manual for Naturalistic Observation, 2006, NFI

*Week 3: ALTERNATIVE MOTOR SUB-SYSTEM OBSERVATION SHEET*

(suggest use of this sheet if NFI do not approve use of Sheet A)

Describe facial expressions, muscle tone, movements and gestures that you observed in 2 minute observations of 5 babies.

	Facial expressions	Muscle tone and position	Movement patterns and gestures	Overall did you think the baby looked organised/disorganised
Baby 1				
Baby 2				
Baby 3				
Baby 4				
Baby 5				

### 3.2.2. Observation: POSITIONING COMFORT SCALE (A1)

(Inga Warren, Cherry Bond and Pani Pantelides 2004)

		Least comfortable				Most comfortable
1.	Aah! Factor	Baby looks uncomfortable (include facial expression and colour) – you feel you want to do something about it!	0	1	2	Baby looks relaxed, comfortable, cosy, content.
2.	Head and trunk	Trunk arched / rotated/ or curvation <b>with</b> a) Head extended <b>or</b> b) Chin on chest , <b>or</b> b) Head flat to side with twisted neck	0	1	2	Head and trunk in line, with head in midline, or $\frac{3}{4}$ to side of head (no twisted neck).
3.	Arms	a) Flaccid or stiff, and stretched out <b>or</b> b) “W” position with shoulders retracted (pushed back) <b>or</b> c) Twisted/ Trapped under body <b>or</b> between body and bedding/ immobilised.	0	1	2	<b>All</b> of the following: a) Shoulders forwards (protracted) b) Arms flexed; relaxed. c) Possibility to reach face / mouth with ease.
4.	Hands	a) Fingers splayed, <b>or</b> b) Hand tightly fistied, <b>or</b> c) Immobilised, or restricted by clothing	0	1	2	<b>One or more</b> of the following a) Hands relaxed, open or fingers softly folded b) Hands together/clasped, c) Touching head, face, mouth, own body, d) Holding on to something.
5.	Legs and feet	a) Flaccid , with straight or “Frog leg” posture (abducted and externally rotated at hips) with feet pointing outwards, <b>or</b> b) Stiff, straight legs with toes splayed or curled tight, and or pushing hard on bedding, turning outwards	0	1	2	<b>In all</b> positions a) Flexed legs with feet touching each other or resting against other leg <b>and</b> b) Able to reach boundary for bracing feet. In prone knees should be tucked under body, feet angled towards each other (not turning out).
6.	Arousal	a) Agitated /Jerky / jittery movements <b>and/or</b> b) Fussing or crying. Unconscious.	0	1	2	a) Sleeping restfully or quietly awake. b) Minimal or smooth movement.
	Total =					(Max score = 12)

## Week 3: Site Assessment: BEDDING AND POSITIONING

For instructions on scoring see Week 1, p26.

	<b>BEDDING AND POSITIONING</b>	Strength	Change	Time
a.	Nests, or soft nesting materials are readily available and used to make babies comfortable with boundaries, when in incubators or cots*			
b.	Nesting often includes a soft boundary encircling the head			
c.	Babies are always positioned within reach of a surface to press their feet against			
d.	Soft, pretty sheets and covers are provided			
e.	Gel pillows are used (under head and shoulders)			
f.	Positioning is individualised to suit each baby, taking into account the baby's preferences and medical needs			
g.	Positioning comfort is audited regularly			
h.	Recommendations for positioning are in infant care plans			
i.	Side lying is widely used to support the baby's skills and comfort			
j.	If a baby needs to lie on his back or front bedding is adjusted to support flexed limbs, rounded shoulders, hand to mouth movement			
k.	A three-quarter supine to side lying position is considered as an alternative to lying on the back when this is medically required			
l.	Procedures such as nappy change or blood taking are carried out in side lying unless contraindicated			
m.	The appearance and parents' perceptions of the baby are considered when positioning and arranging bedding			
n.	Babies have time to get used to sleeping on their backs before going home.			
o.	All members of staff are familiar with the SIDS recommendations			
p.	Positions are specifically adapted for infants suffering from reflux			
q.	Babies are supported in a nest or wrap for lifting and transferring out of the incubator or bed			
r.	Babies' limbs are tucked in before being lifted			
s.	All staff have had the opportunity to learn the principles of supportive positioning and handling			
	Your score			
	Max score	38		
	Percentage: $100 \div 38 \times \text{your score}$			

When considering nesting for babies in cots or beds be mindful of safety guidelines regarding Sudden Infant Death.

Adapted from Warren I, Bond c, 2004, [A Guide to Infant Development in the Newborn Nursery](#)

### 3.5.2. Practical Tip Sheet

This method of making a nest with flat folds of fabric can be easily and cheaply made. It is very versatile and can be adapted in many ways to suit the size and needs of the baby. The lining can be used to wrap the baby during transfers

#### MAKING A NEST

Materials: a soft sheet / blanket for the outside layer: 1 or 2 sheets /blankets/ towels folded corner to corner for the inside layer.



1. Place the folded inside layer over the outside layer and make a 4 – 6 " fold, depending on size of baby, smoothing the fabric.



2. Keep folding and smoothing until you have used up all the fabric.



3. Arrange the folded fabric into a U or an oval to fit the baby.



4. Tuck in the tail ends of the inside layer to help the nest to keep its shape.



5. The bottom of the nest should be thick enough to be firm and high enough to contain the baby's legs.



6. Line the nest with a smaller soft cloth e.g. muslin, which can be worn by the mother to carry her odour. Use this liner to swaddle the baby e.g. when lifting out of the bed.

*Inga Warren, Rebecca Abrey, Sumaya Tickner, 2011*

## Week 4

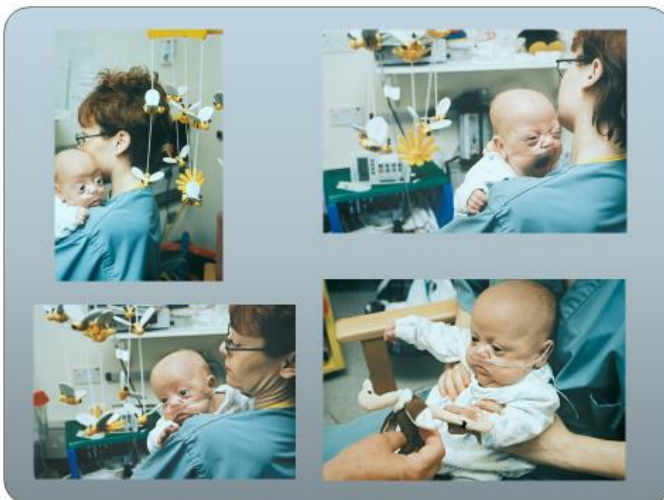
# STATE SUB-SYSTEM



“Behavioral state’ is the term used to describe levels of consciousness or arousal. States are characterized by differences in movement, body tone, facial expression, eye movement and breathing.

Being able to recognise behavioural states is an important part of neurodevelopmental care. Sleep is essential for growth and brain development; establishing cycles with periodic waking is important for successful

feeding; periods of quiet wakefulness are important for bonding. Observing behavioural states in preterm babies can be difficult; the states are often unclear and fragmented. By the time a baby reaches term they are usually much more obvious and sustained.



### Attention and interaction

State 4, the state of quiet alertness is the state in which babies are most attentive and available for interaction. Because these behaviours may be difficult to catch during the brief observations that form part of this course they have been incorporated into the observations of behavioural states.

This week a Behavioural States Observation sheet helps you to observe behavioural states of the babies in your unit.

### Competency

- Identifies behavioural states and uses this knowledge to adapt caregiving routines to protect sleep and facilitate interaction.

## 4.1 DEVELOPMENT

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For the purposes of observation we have used the commonly accepted definitions of behavioural states as described in the Neonatal Behavioural Assessment Scale (Brazelton and Nugent 1995). The behavioural states are numbered 1 to 6, with 1 being the least aroused (quiet sleep) and 6 being the most aroused (crying). Sleeping and waking states in adults are hormonally linked to night and day (circadian rhythms). In the uterus these patterns are influenced by the mother's rhythms. In the neonatal unit the infant's capacity to establish these patterns will be influenced by the environment.

The behavioural states of preterm infants are often difficult to distinguish as they tend to be fleeting and indistinct, with diffuse behaviour. They are much more stable and distinct in term infants.

### Sleep states

Before 28 weeks gestation the baby's sleep does not usually have the typical patterns that are associated with true sleep states and sleep is referred to as "indeterminate sleep". From about 28 weeks an EEG will begin to show patterns of electrical activity that classify sleep as quiet (non-REM) or active (REM) sleep.

Adults spend most of their sleep time in quiet sleep; active sleep is associated with dreaming. Preterm infants spend more time in active sleep. Quiet sleep gradually replaces indeterminate sleep until near term when equal amounts of time are spent in both sleep states. The development of quiet sleep is sometimes used as a measure of brain maturation; babies who are developing well have quiet sleep at an earlier age than those who will have developmental problems later on.

### State 1: Quiet sleep (non-REM)

Quiet sleep is characterised by regular waves of electrical activity seen on the EEG. The baby makes **very little movement**, hence the name, although you may notice **occasional startles or little mouthing movements. Breathing is slower and steadier** than in active sleep. When quiet sleep is first observable it may be for very short periods; by 30 weeks gestation it's easier to spot and from 32 weeks you should be able to see clear patches of quiet sleep that gradually become longer, more solid and less easily disturbed.

Quiet sleep is very important for growth and repair of body tissues, as well as for brain development.

### State 2: Active sleep (REM sleep)

Active sleep is sometimes called paradoxical sleep because the EEG patterns closely resemble those of waking states. During active sleep you will notice bursts of **rapid eye movements** under the lids that signify electrical activity in the brain. You may also notice **changes in facial expression, including flickering "smiles"** and the baby may seem more **restless and fidgety. Breathing is faster and more irregular** than in quiet sleep.

Active sleep has a very important role in sensory systems development. A lot of activity goes on in the brain during sleep and this activity helps to make connections that will allow the baby to process information and prepare for the multitude of sensory experiences that will greet him in the outside world.

### **State 3: Transitional states**

Waking up and going to sleep are usually gradual process as we pass through a transitional, drowsy period. In preterm infants waking may be more abrupt or the infant may hover between sleeping and waking, never quite waking fully. During transitional states the **eyes may stay closed** but the level of **activity** suggests that the baby is no longer asleep; or the **eyes may open and close**, or stay open with a **glazed expression**. The baby may begin to show **signs of wanting to suck** as he wakes or may make **fussing sounds**. If a baby is disturbed during the transition between waking and sleeping this may prevent him from reaching a sleep state. On the other hand if a baby is showing signs of rousing then this may be a good time to prepare for caregiving with a soft voice and gentle touch to make the baby aware of your presence. Preterm babies need time and support to wake and go back to sleep.

### **Waking States**

#### **State 4: Quiet awake**

When quietly awake the baby has eyes open and makes very little movement. Breathing is usually regular. These periods are good times to interact with the baby, to watch for his responses to his parents' touch and voice. In the preterm period vision is not well developed and even though by 34 weeks g.a. the baby may be able to fix and follow a moving object it is unlikely that he can process visual information into images, nevertheless he may appear to be looking as he moves his eyes towards the source of a sound. Sound and vision are quite closely entrained at this period of development.

In the preterm period alertness often looks rather glazed (hypo-alert) or tense (hyperalert). The eyes may look very dark at first as the pupils do not constrict until about 32 weeks gestational age. Towards term babies begin to organise their alertness with bright focused attentiveness. Facilitating this alerting behaviour is very important for the communication between infant and parents.

#### **State 5: Active awake**

In state 5 the infant's level of activity indicates that he is not asleep, although the eyes may be open or shut. Breathing tends to be irregular. In state 5 the baby may be telling us he is hungry or uncomfortable. Sometimes he may be able to settle himself back to a quieter state, if not he may continue to become more and more aroused and upset.

#### **State 6: Crying**

A baby in state 6 is clearly upset. A term baby may cry vigorously and lustily. Preterm infants may muster a brief, weak cry but often indicate their level of distress with silent cry and agitated activity.



State	Breathing	Eyes	Movements	Sounds	Preterm
State 1: Quiet sleep	Regular (Slower than 2)	Shut. No REM	Occasional startles	No	
State 2: Active sleep	Irregular (Faster than 1)	Shut. REM	Some activity	No	
State 3: Transitional	Irregular	Open or shut. blinking	Some activity e.g. sucking	May fuss a little	
State 4: Quiet awake	Regular	Open	None	No	May appear glazed or hyper- alert
State 5: Active awake	Irregular	Mostly open	Active	May fuss	
State 6: Crying	Irregular	Open or shut	Very active	Cries	Agitated; silent cry

BEHAVIOURAL STATES: Adapted from Brazelton and Nugent 1995,

PCA	Hours Sleep	Indeterminate Sleep	Active (REM) Sleep	Quiet (Non-REM) Sleep
20-28 weeks			Irregular activity	
32 weeks	Approx. 18	30%	20%	Predominant 50%
34-36 weeks			Establishes periodicity with cycles of states 1,2, 3 and 4.	
37 weeks	15/16	<10%	<50%	50%
Term	15/16		<50%	<50%
Term +28 days	12/15			
1 year	14		20%	80%
3-5 years	12		Adult Pattern	

MATURATION OF SLEEP (References to be added)

ORGANISATION OF STATE SUB SYSTEM.

Signs of vulnerability / instability	Signs of maturity / stability
Diffuse, unclear states	Clearly defined states
Discontinuous	Cycles
Frequent state changes	Stable states
Abrupt transitions	Smooth transitions
Limited range available	Full range available 1-6

Facilitating state system regulation.	
Restful sleep	Protect all sleep states and cycles as far as possible, including REM-sleep. Be aware that movements around the bed and changes in lighting as well as sounds can interrupt sleep. Preterm infants find it difficult to habituate and shut out such disturbances.
Transition	Try not to interrupt transitional states if you think the baby is trying to get to sleep. If the baby appears to be making the transition to wakefulness this could be a good time to prepare the baby for care with, a soft voice and gentle touch.
Quiet alertness	Preterm and newborn babies find it easier to alert in subdued lighting so maintain shade when baby is awake. Gradually introducing periods of exposure to moderate light is thought to be beneficial for growth.
Attention and interaction	When a baby is in a quiet alert state he may show a response to harmonious sounds, such as a soft voice, by becoming still or turning to find the sound. Low level lighting can be helpful. It may take time for him to organise a response so wait a few moments. Too many kinds of stimulation at one time will be overwhelming and his response will be best when it is quiet and calm. Watch for signs such as floating eye movements, yawning, fussing, a change in quality of alertness with staring or glazed eyes, or shutting eyes, all of which may tell you he has had enough or needs a break. Although vision is very immature during the preterm period the baby may still, from as early as 34 weeks, make efforts to fix and follow a face or slowly moving bright object.
Soothing and Self-regulation	It is important to make the baby comfortable in order to sleep well; this means allowing them to move about a little as well as supporting self-regulating positions. When a baby becomes aroused watch for a moment to see what efforts he makes to settle himself and how much help he needs.

## 4.2 OBSERVATION

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4.2.1 For this bedside observation use the sheet Behavioural States A. Observe six babies at the bedside and record their behavioural states.

4.2.2 You will use the sheet Behavioural State B to observe one baby's behavioural states before and after an episode of care.

*Alternative behavioural state observation sheet provided if NFI do not agree to sheet A*

## 4.3 FAMILY

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Ask parents what they have noticed about behavioural states. If they have noticed their baby being quietly awake ask about their baby's response to their voice.

#### 4.4 REFLECTIONS

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This week you observed babies' behavioural states. Many students find it quite difficult to recognize and remember these. It is particularly difficult in preterm babies when the states are not clearly defined and change frequently. How challenging was this for you? Did you notice things that may have adversely affected the infants' behavioural states and what did you think could be done about this. Did you ask parents about their baby's sleep and the way he/she behaves when awake? How did this help you with your observations?

#### 4.5 SYSTEM CHANGE

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The baby's ability to achieve state regulation will in part depend on an environment that promotes restful sleep and quiet alertness. Use the checklists on light and sound (p60-61) to consider how those aspects of the environment are managed in your unit.

Ask colleagues what they have noticed about behavioural states, attention and interaction.

#### 4.6 EVIDENCE

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GravenSN, Browne JV, 2008, Sleep and brain development, *Newborn and Infant Nursing Reviews*, 173-179.

VandenBerg KA, 2007, State systems development in high risk new-borns in the Neonatal Intensive Care Unit, *J Perinat Neonat Nursing*, 21 (2): 130-139

#### References

Brazelton TB, Nugent JK, 1995, Neonatal Behavioural Assessment Scale, 3<sup>rd</sup> Edition, Cambridge University Press.

White R D, et al, 2013, Recommended standards for newborn ICU design, 8<sup>th</sup> edition, *Journal of Perinatology*, 33: S2-16

Warren I, Bond C, 2004, Guidelines for Infant Development in the Newborn Nursery

Warren I, Bond C, 2010, A Guide to Infant Development in the Newborn Nursery.

## WEEK 4: STATE SUB-SYSTEM OBSERVATION SHEET A

- Each column represents 2 minutes of observation time.
- Choose 5 babies to observe for 2 minutes and complete one column for each baby.
- Preterm infant states are often unclear and change frequently. As babies mature their states become clearer and more sustained.

Adapted from Als 2006, manual for the Neurobehavioral Observation of Newborn Behavior, NFI 2006.

<b>Sleep states</b>					
1. Quiet Sleep (deep sleep)					
					Slow regular breathing. Eyes closed, no eye movements. Relaxed facial expression. No spontaneous activity except isolated startles and occasional sucking movements.
2. Active Sleep (light, REM sleep)					
					Breathing faster and more irregular than in quiet sleep. Rapid eye movements (REM) under lids. Subdued startles. Mild sucking and mouthing movements; whimpers, sighs, smiles, brief eye opening.
3. Transitional: infant moving between sleep and waking					
					Drowsy. Eyes may be open or closed, eye-lids fluttering or blinking. If open eyes look glazed. Variable, diffuse activity such as fussing, whimpers, grimacing, startles.
<b>Waking states</b>					
4. Quietly awake and alert. Preterm infants may appear hypo – or hyper- alert.					
					Alert with shiny eyes and bright expression; attentive. Minimal movement.
4 Hypo-alert					Hypo-alert. Glazed look, with dull, pained or strained expression. Looks through rather than at object/caregiver. Minimal activity, low energy.
4 Hyper-alert					Hyper-alert; eyes wide open looking panicked, fearful. May get hooked onto a stimulus and unable to look away.
5. Actively awake and aroused . Often seen when moving between states 4 and 6.					
					Awake and aroused. Eyes open or closed. Considerable, motor activity. May fuss audibly. May show signs of discomfort such as distressed facial expression, grimacing.
6. Highly aroused, agitated, upset and/or crying					
					Highly aroused. Mature infants produce lusty, rhythmic, vigorous crying. Preterm infants show intense upset with grimace, strained, weak cry, silent cry face, frantic movements.
<b>Other</b>					
No state					Prolonged respiratory pause (> 8 seconds) or appears unconscious / heavily sedated
Indeterminate sleep					Very preterm infants may not exhibit true states – use this category if preterm infant sleep does not fit 1 or 2.

**Week 4: ALTERNATIVE STATE SUB-SYSTEM OBSERVATION SHEET**

This sheet may be used as an alternative to the stse sub-system observation sheet.

Observe five babies at the bedside and record their behavioural states.

<b>Baby 1: Observe for 2 minutes. What did you see?</b>			
<b>Eyes</b>	<b>Activity</b>	<b>Sounds</b>	<b>Breathing</b>
Eyes open	A little body movement	No sounds	Slow
Eyes closed	Fingers and toes move	Little fussy sounds	Regular
Eye movements under lids	Flickering facial expressions,	Brief cry	Fast
Opening and closing, blinking	Mouth movements	Vigorous cry	Irregular
Bright eyes	Startles		
Dull eyes	Much body movement		
Hyperalert	Agitated		
<b>Which behavioural states did you see?</b>			
1. Quiet sleep	2. Active sleep	3. Transition	
4. Quiet awake	5. Active awake	6. Crying /agitated	Not sure

4.2.1. Observation: BEHAVIOURAL STATES (B)

When you have practised looking for behavioural states make notes about a baby’s behavioural state before and after an episode of caregiving. Watch the baby for a few moments before you start and again after you finish.

<b>What did you see before you started caregiving?</b>			
<b>Eyes</b>	<b>Activity</b>	<b>Sounds</b>	<b>Breathing</b>
Eyes open	A little body movement	No sounds	Slow
Eyes closed	Fingers and toes move	Little fussy sounds	Regular
Eye movements under lids	Flickering facial expressions,	Brief cry	Fast
Opening and closing, blinking	Mouth movements	Vigorous cry	Irregular
Bright eyes	Startles		
Dull eyes	Much body movement		
Hyperalert	Agitated		
<b>Which behavioural state was the baby in before you started caregiving?</b>			
1. Quiet sleep	2. Active sleep	3. Transition	
4. Quiet awake	5. Active awake	6. Crying /agitated	Not sure

What did you see after the caregiving?			
Eyes	Activity	Sounds	Breathing
Eyes open	A little body movement	No sounds	Slow
Eyes closed	Fingers and toes move	Little fussy sounds	Regular
Eye movements under lids	Flickering facial expressions,	Brief cry	Fast
Opening and closing, blinking	Mouth movements	Vigorous cry	Irregular
Bright eyes	Startles		
Dull eyes	Much body movement		
Hyperalert	Agitated		
Which behavioural state was the baby in at the end of caregiving?			
1 Quiet sleep	2 Active sleep	3 Transition	
4 Quiet awake	5 Active awake	6 Crying /agitated	Not sure

## WEEK 4: SITE ASSESSMENT: LIGHT AND SOUND

	LIGHT	Strength	Change	Time
a	The unit has evidence based guidelines for management of lighting.			
b	Adherence to lighting guidelines is regularly audited.			
c	Windows have opaque curtains or blinds that can filter or block out bright light			
d	Bright overhead light is only used in emergencies			
e	Intensity of lighting can be gradually adjusted e.g. by dimmer switches			
f	Soft lighting is available to create a cosy atmosphere			
g	Each cot has an individual spotlight for procedures, or if individual spotlights are not available a mobile spot light is provided			
h	Thick incubator covers, covering the top and sides are available for all incubators and are used appropriately (baby must be visible at all times)			
i	Screens or covers are used to contain phototherapy lights so that adjacent babies are not affected			
j	Open cots have canopies or hoods to provide privacy and shade			
k	Spot lighting is provided for work stations			
l	Room lighting can be cycled for individual babies with moderate daytime light (200 – 300 lux) and near darkness > 25 lux at night			
m	Light is adjusted to suit the developmental needs of babies at different developmental stages e.g. term babies need more light for visual development than preterm babies.			
	Total			
	Max score	26		
	$\% = 100 \div 26 \times \text{your score}$			

Adapted from Warren I, Bond C, 2004, A Guide to Infant Development in the Newborn Nursery



Adapted from Warren I, Bond C, 2004, A Guide to Infant Development in the Newborn Nursery

<b>SOUND</b>	Strength	Change	Time
The unit has evidence based guidelines for managing sound			
Adherence to sound management guidelines is audited regularly			
There are no telephones or door bells ringing in the nurseries			
If telephones are present they are set with muted ring			
There is no public address system in the nursery			
Personal "bleeps" are set to vibrating rather than acoustic mode			
Monitor alarms are set on the lowest setting (below 70dcB)			
Monitor alarms are always turned off promptly			
If telephones are present they are set with muted ring			
Radios or televisions are not used in the nurseries			
Staff habitually talk quietly			
Doors to the nursery are kept closed to keep out noise			
Doors, drawers and bin lids are padded and silent			
Staff wear soft soled, quiet footwear			
Sinks and bins are away from the cots			
Mobile stocking up units are used so this does not need to be done in the nursery			
Nursery floors are mopped rather than vacuumed or mechanically polished			
Parents are encouraged to talk and sing to their baby			
Music e.g. lullabies, is only used if prescribed for individual babies			
Sound levels are normally within the recommended range: average below 45 DcB background and peaks not more than 65 DcB			
Total			
Max score	40		
% = $100 \div 40 \times$ your score			

# Week 5

## SELF-REGULATION

This week you will observe babies' self-regulation behaviours.

Self-regulation is a very important part of development. The term self-regulation is given to the baby's ability to organize himself to keep all the subsystems in balance, to seek and process developmentally appropriate stimulation, to protect and defend himself from threatening or destabilising stimuli.

The ability to self-regulate is an essential skill for life and is linked to better developmental outcomes. Understanding self-regulation and strategies that support it are an essential part of neurodevelopmental care. The caregiver's role as a co-regulator is to support the infant's efforts to self-regulate.

Sensory experiences affect the way that connections are laid down in the developing brain. The preterm infant, faced with the challenge of adjusting to the extra-uterine environment will make efforts to process these new experiences and to self-regulate. Success will depend on the sensitivity of our co-regulatory efforts in managing the environment and caregiving interactions.

Co-regulation will be explored in more depth in Week 6 and Part 2.

### Competency

- Recognizes patterns in the way an infant communicates.
- Adapts pacing and support for the baby according to behavioural cues.

## 5.1 DEVELOPMENT

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Development is a process of balancing agonists and antagonists, approach and avoidance. Each infant has a unique developmental agenda and every infant requires developmentally appropriate experience to fulfill their potential. The infant will seek appropriate experience and avoid inappropriate experience, and will exhibit behaviours that indicate readiness to engage or need to disengage. This guides our dialogue with the baby and helps us to understand when the stimuli provided meet the baby's needs.

Preterm infants need much support to achieve any balance in sub-system organization and at first will need high levels of co-regulation. This co-regulation will be most successful when it supports the infant's own efforts. Some babies appear to prefer some strategies over others, for example you may notice that some make frequent efforts to clasp hands together while others seem more determined to grasp and hold on to something or bring their hands to their face.

As the baby progresses towards his due date a major challenge will be organization of attention in order to learn about and interact with the world around him. If an experience is appropriate in terms of complexity, timing or intensity, the infant will show interest (approach) as if seeking the experience he needs for his next developmental steps.

Defensive or self-protective (avoidance) behaviours tell us when the baby feels overwhelmed. During interactions he may "shut down" with eyes closed, or avert his gaze; he may become restless and distressed with extended movements and posture; his heartbeat, oxygen levels, colour or breathing may show signs of stress. If not supported he will lose energy and muscle tone and become increasingly vulnerable.

The baby's responses need to be interpreted in the context of what is going on, the baby's individual and characteristic behavioural repertoire, and his emerging strengths and goals. The caregiver needs to allow the baby opportunities to strive towards and achieve his next steps while at the same time recognizing his stress thresholds.

**SELF REGULATION  
and  
CO-REGULATION**

- Recognising stress thresholds
- Dialogue with the baby
- Facilitation of best response

## 5.2 OBSERVATION

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5.2.1. For this bedside observation use OBSERVATION: SELF REGULATION A. to observe a baby before during and after caregiving. Which behavioural signs did you see?

5.2.2. Read the scenario presented with the traffic light sheet and use red, yellow and green pens to highlight the behaviours described according to which level of self-regulation you think they fit.

## 5.3 FAMILY

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Ask parents about their observations of their baby's self-regulatory efforts and successes. How does their baby tell them he is uncomfortable, tired or needs a break. How does he look when he is content?

## 5.4 REFLECTIONS

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This week you started to build a picture of how babies tell us what they are comfortable with and when they are beginning to feel overwhelmed.

How confident did you feel about completing the assignments this week? How do you feel this experience will affect your caregiving? Did you ask parents and colleagues about signs of the babies' comfort/likes and discomfort/dislikes? Did their observations match yours? Is it easy for you to ask what others think and give them time to respond without wanting to tell them what you see?

## 5.5 SYSTEMS CHANGE

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You will look at co-regulation in different aspects of care in part 2 of this course.

Ask colleagues for their observations about self-regulation and what they do to be co-regulators. .

## 5.6 EVIDENCE

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Lynn L N, Cuskelly M, O'Callaghan M J, Gray P H, 2011, Self-regulation: A New Perspective on Learning Problems Experienced by Children Born Extremely Preterm, *Australian Journal of Educational & Developmental Psychology*. 11: 1-10

### Reference

Nugent J K et al, 2007, Understanding Newborn Behaviour and Early Relationships, Paul Brookes Publishing




## 5.2.1. OBSERVATION SHEET: SELF REGULATION

Observe a baby before during and after caregiving. Which behavioural signs did you see? Did you think they indicated approach or avoidance?

Typical examples of behaviour that show the baby's SENSITIVITY and VULNERABILITY. These include signs of stress, fending off or withdrawing actions. They tell you that the baby may need help, time out or a change.	
<input type="checkbox"/> pauses in breathing <input type="checkbox"/> colour changes e.g. dusky, mottled <input type="checkbox"/> positing <input type="checkbox"/> straining <input type="checkbox"/> coughing <input type="checkbox"/> sneezing <input type="checkbox"/> sighing <input type="checkbox"/> hiccups <input type="checkbox"/> yawning <input type="checkbox"/> squirming <input type="checkbox"/> arching <input type="checkbox"/> grimacing <input type="checkbox"/> tongue thrust <input type="checkbox"/> twitching <input type="checkbox"/> limp or stiff posture <input type="checkbox"/> bracing legs	<input type="checkbox"/> mouth hanging open <input type="checkbox"/> sudden movement <input type="checkbox"/> jerky movement <input type="checkbox"/> tremulousness <input type="checkbox"/> finger splay <input type="checkbox"/> "salute" <input type="checkbox"/> "sit on air" <input type="checkbox"/> "high guard" hands <input type="checkbox"/> fussing <input type="checkbox"/> agitation <input type="checkbox"/> whimpering <input type="checkbox"/> crying <input type="checkbox"/> diffuse states <input type="checkbox"/> eye floating <input type="checkbox"/> looking away <input type="checkbox"/> staring <input type="checkbox"/> glazed look
Typical examples of behaviours that tell you, even briefly, how COMPETENT the baby is becoming with efforts to settle, to still movements, to get ready to interact with you and the environment..	
<input type="checkbox"/> steady breathing <input type="checkbox"/> healthy colour <input type="checkbox"/> hands together, clasped <input type="checkbox"/> smooth movements <input type="checkbox"/> feet together <input type="checkbox"/> grasping <input type="checkbox"/> holding on <input type="checkbox"/> moving hand to face <input type="checkbox"/> hand to mouth <input type="checkbox"/> hands clasped together <input type="checkbox"/> frowning	<input type="checkbox"/> rooting <input type="checkbox"/> sucking <input type="checkbox"/> softly flexed posture <input type="checkbox"/> relaxed, open face <input type="checkbox"/> perky attentive expression <input type="checkbox"/> orientation to voice or sound <input type="checkbox"/> smooth state change <input type="checkbox"/> restful sleep <input type="checkbox"/> snuggling when held <input type="checkbox"/> responsive smiling <input type="checkbox"/> easily consoled <input type="checkbox"/> settles self

### 5.2.2. Observation: SELF REGULATION (B)

Read the scenario below and use coloured pens to highlight behaviours that you deem to fit green, yellow or red categories of regulation. (The idea of using the traffic light metaphore came from Nugent et al 2007.

	<p>Successful self- regulation: the baby is well organised and is telling us that he is comfortable, content, ready for sleep, interaction or more intervention.</p>
	<p>Makes efforts to self-regulate that are partly or briefly successful; may begin to show signs of tiring, becoming unstable or upset that suggest you might need to slow down, pause or offer more effective support and comfort.</p>
	<p>Baby appears disorganised and needs co-regulation in order to reach stability and achieve comfort</p>

1. Kaye was dangling a brightly coloured toy in front of Naomi’s face. At first Naomi stared at it and grimaced. Then she turned her head away, and poked out her tongue. She got hiccups and shut her eyes. Her arms lay limply by her side. Kaye put the toy away, pulled the blanket more closely around Naomi and sat quietly gazing at her daughter. After a few minutes Naomi squirmed her body, opened her eyes and looked towards her mother. She shut her eyes again. Kaye moved her face a little further away and this time when Naomi opened her eyes she looked towards her mother, her face softening. Kaye smiled. “I think she knows me” she whispered.

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2. After his nappy change Jim was awake but unsettled. He looked a little pale around his eyes. He began to arch his back and stretch his legs out stiffly, lifting them off the bed. He quickened his heart beat to 180 beats a minute and dipped his oxygen levels to 79% He closed his eyes and made grasping movements, clutching at his face in an effort to settle himself. His nurse offered him a soother and as he sucked Jim brought his feet together. He became quiet and opened his eyes. He settled his heart beat into the 160 range with his blood oxygen at 92%.

## Week 6.

# STRENGTHS AND CHALLENGES

This week you will apply what you have learnt from your observations in weeks 2-5, to assess 2, or more, babies throughout caregiving.

Look for signs of the baby's **STRENGTHS** (behaviours that show the baby's emerging competence) and **SENSITIVITY** (behaviours that show the baby's vulnerability) in each of the following domains

- Autonomic
- Motor
- Behavioural State

Ask yourself when did the baby looked strongest, most organized and comfortable (self-regulation)? Think about what worked well for the baby and what he/she was telling you about the next steps in his/her development. Consider how you might be able to help the baby achieve those next steps (co-regulation).

When did the baby show signs of sensitivity or vulnerability? What were the challenges for the baby? Consider if things could have been done differently to give the baby more time, more support, more comfort.

Consider how you could use these observations in your daily reports, rounds, or notes.

### **Competency**

- Provides co-regulatory support in response to the infant's signs of distress, disorganisation, or emerging competence to self-regulate.
- Considers all the behavioural domains in assessment of the infant's current progress and challenges.
- Begins to use observations in daily reports



## 6.1 DEVELOPMENT

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The synactive model of infant behaviour and development (Als 1982 ) describes how all the behavioural domains (sub-systems), interact with each other and with the environment. If one sub-system is destabilised this can affect all the others. On the other hand when an intervention helps the baby to be better organised in one area this can support better organisation in all the others.

The infant is affected by what is going on around him in the environment, and by the way he is cared for. The baby's behaviour also has an impact on the caregiver. Not only is the baby an active agent who seeks to organise himself but he is also an active partner in his relationship with the caregiver.

A preterm baby's responses tend to be quite undifferentiated at first; reactions tend to be "all or nothing". Gradually as he grows and matures he will become more able to inhibit some behaviours and make more discrete, and specific responses to stimuli.

## 6.2 OBSERVATION.

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Observe one or more episodes of care. After an episode of care, summarise on the observation sheet "SUMMARY OF INFANT STRENGTHS AND CHALLENGES" the baby's signs of strength and sensitivity in all different areas you have learnt to observe in week 2-5.

## 6.3 FAMILY

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If you have the opportunity to ask parents about their baby ask what changes they have noticed in the last week. Ask them what they have noticed about their baby's efforts to settle – what works for him.

## 6.4 REFLECTIONS

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Now you are being asked to combine your experiences in weeks 2 -5 to get a more complete picture of each baby's way of responding and to start thinking about next steps. How did you prepare for these observations? Did you feel confident about taking this next step in your practice? What do you think about using these observations in your daily reports?

## 6.5 SYSTEM CHANGE

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Consider how you might use your observations of the baby's strengths and challenges in your daily reports and rounds.

Exercises in managing co-regulation will be in part 2 of this course.

ALS H. et al 2004, Early experience alters brain function and structure *Pediatrics* 113(4):846-857

Peters C L, et al, 2009, Improvement of short and long term outcomes for very low birth weight infants: Edmonton NIDCAP Trial *Pediatrics* 124(4): 1009-1020

### Reference

Als H 1982, Towards a synactive theory of development; promise for the assessment and support of infant individuality. *Infant Mental Health Journal* 3(4):229-243

Als H, 2006, Documentation of NIDCAP Observation: Journal Page, NFI

### MIDWAY EVALUATION:

If you have not contacted your mentor/ course leader yet this would be a good time to catch up and discuss your progress.

We would also like you to summarise your experience of the course so far, following the suggestions on page 68, and include this in the notes you send to your course leader or mentor. An electronic version of this sheet is included in the documents on the memory stick provided.

We would like to know what you think of the books and any articles that you have read. Overall, what has been your experience of observing babies and what has been the reaction of colleagues and parents? Have you noticed some changes in the way you work? Did you have enough time to do the work week by week? Add any other comments or suggestions you would like to make.

## Mid-way Evaluation

(Electronic version available to fill in and email to mentor)

Before you start Part 2 send your reflective diary and this mid-way evaluation to your mentor, and discuss your progress with him/her.

### The workbook

- How easy has it been to follow the course work in the workbook?
- Have all the assignments been clear and easy to understand?
- Is the order of the assignments sensible?

### Observation:

- How was your experience of observing the baby's behaviours?
- Were you able to integrate your observations into your daily routine?
- Did you experience the observations as a burden or as a positive challenge?
- How did you use your observations? With parents? With colleagues? How did they react?
- Did you use the observations in your daily reports? If so how?

### Reading

- Have you read all the articles?
- Which ones were useful for your own practice?
- Did you use any information from the articles to inform parents or colleagues?
- Was the level of the articles appropriate for your level of education?

### Mentor

- Did you use the opportunity to contact your mentor?
- Was he/she available?
- Did the contacts with your mentor meet your expectations?
- Could your mentor have helped you in any other way?

### General:

- Have you noticed some changes in the way you work?
- Did you have enough time to do the work during work time?
- Has the course met your expectations so far?
- Do you think this course is useful? Who for?
- Please write any other comment. We appreciate your feedback.

## 6.2. OBSERVATION: STRENGTH AND CHALLENGES

After an episode of care, summarise the baby's signs of strength and sensitivity in all the different areas you have learnt to observe in weeks 2 -5. .

Baby's name: Area : ITU / HDU/ SCBU/ Other	Birth g a. Current g.a.	Date: Observer:
	<b>Strengths (competence)</b>	<b>Challenges (Sensitivity/vulnerability)</b>
<b>Autonomic sub-system</b> e.g. HR, RR, O2, twitches, tremors digestion, etc		
<b>Motor sub-system</b> e.g. tone, quality of movements, extension v flexion.		
<b>State sub- system</b> e.g. Range of behavioural states, clarity and stability		
<b>Self-regulation</b> What efforts did the baby make to get comfortable?		
<b>Next steps</b> How could you help this baby to build on his efforts to self-regulate?		

Adapted extract from Als H, 2006, Documentation of NIDCAP Observation: Journal Page, NFI

