Neonatal Resuscitation Guideline

Summary statement: How does the document support patient care?	By providing clear guidance for staff involved in neonatal resuscitation
Staff/stakeholders involved in development:	Paediatric Consultants, Obstetric Consultants and Senior Midwifery Staff
Division:	Women and Children's
Department:	Maternity & Neonatal
Responsible Person:	Chief of Service
Author:	Paediatric Lead Consultant and Neonatal Matron
For use by:	All Medical and Midwifery staff involved in the resuscitation of newborns.
Purpose:	To provide evidence-based guidance on the management of Neonatal Resuscitation.
This document support:	NICE (2014) Intrapartum Care CG190 (last updated 2017) Resuscitation Council UK: Newborn Resuscitation Council UK COVID-19 considerations
Key related documents:	**UH Sussex (SRH & WH) Maternity Guidelines:** Examination of the Newborn, Admission to Neonatal Unit, Immediate Care of the Newborn UH Sussex Resuscitation Policy (2018) UH Sussex Medical Devices Policy
Approved by:	Maternity joint Paediatric Meeting: 27th June 2023 JOGG: 18th January 2023 Medicines Governance Committee: 4th April 2023
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Ratification Date:	Not Applicable – Divisional Ratification only required
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If you require this document in another format such as Braille, large print, audio or another language please contact the Trusts Communications Team	
Reference Number:	CG1128

Version	Date	Author	Status	Comment
1.0	October 2010	Paediatric Lead Consultant and Practice Development Midwife	Archived	New Trustwide guideline
2.0	November 2010	Paediatric Lead Consultant and Practice Development Midwife	Archived	Minor amendment
3.0	April 2011	Lead Matron Neonates	Archived	On-call Paediatric Consultant presence information updated
4.0	May 2012	Consultant Pediatricians	Archived	Guideline amended to include Paediatrician attendance at delivery
5.0	January 2013	Clinical Governance (CNST Lead)	Archived	Process clarification
5.1	November 2013	Consultant Paediatricians	Archived	3 year review-no changes
5.2	June 2016	Band 7 labour ward coordinator	Archived	3 year review and amendments
6.0	September 2020-March 2021	Head of Nursing Neonatal Matron Clinical Director Maternity Clinical Effectiveness Team	Archived	Updated. New proforma devised by S. Harris (midwife)
6.1	January 2023	Maternity Clinical Effectiveness Team E. Yates, Consultant paediatrician	LIVE	Additions to 6.2 Paediatrician to review. NNU changed to SCBU throughout. Appendix 1: adrenaline dosage amended to 0.2ml/kg to align with NLS (2021).

The interpretation and application of clinical guidelines will remain the responsibility of the individual clinician.

If in doubt contact a senior colleague or expert.

Contents

Neonatal Resuscitation Guideline

1.0 Aim

To ensure that when neonatal resuscitation is required, there is available equipment and trained personnel to initiate basic life support at birth and in the immediate postnatal period.

2.0 Scope

This guideline is applicable to all staff who are involved in newborn life support.

3.0 Responsibilities

Midwives & Obstetricians, Paediatric Staff:

- To access, read, understand and follow this guidance
- To use their professional judgement in the application of this guideline

Management:

- To ensure the guideline is reviewed as required in line with Trust and National recommendations.
- To ensure the guideline is accessible to all relevant staff

4.0 Abbreviations used in this guideline

SHO - Senior House Officer	**PEEP -** Positive End Expiratory Pressure
CTG - Cardiotocograph	**HSIB -** Healthcare Safety Investigation Branch
A&E - Accident & Emergency	**ATAIN -** Avoiding Term Admissions into Neonatal Units
SCBU - Special Care Baby Unit	

5.0 Background

The Neonatal Resuscitation process within this Trust follows the guidance of the Resuscitation Council (UK, 2021). Please note, due to COVID-19, see the Resuscitation Council UK (2020) revised safety guidance/resources website for the impact upon newborn life support.

Passage through the birth canal is, by adult standards, a relatively hypoxic experience for the fetus since significant respiratory exchange at the placenta is prevented for the 50 - 75 seconds duration

of the average contraction. Though most babies tolerate this well, some do not and these few may require help to establish normal breathing at delivery.

Newborn life support is designed to provide this help and it comprises the following elements: drying and covering the newborn baby to conserve heat, assessing the need for any intervention, airway opening, lung inflation, rescue breathing, chest compressions and, very rarely, the administration of drugs.

Following any neonatal resuscitation, the parents must have a full explanation of events by a paediatrician.

The neonatal lead paediatrician on each site is responsible for clinical standards in relation to the care of the newborn; and provides a link between the neonatal service and labour.

6.0 Communication

Staff in the maternity unit can access the on call neonatal emergency team by dialing '**2222'** and stating '**Neonatal Emergency' and place of emergency.**

This will summon:

- Paediatric tier 2 bleep holder (registrar or Advanced Nurse Practitioner)
- Paediatric tier 1 bleep holder (SHO or Advanced Nurse Practitioner)
- Senior Neonatal Nurse
- Maternity Bleep Holder

The on-call Paediatric Consultant can be contacted via switch board. If their presence is required they should be available within 30 minutes.

The **'Neonatal Emergency'** call should be considered in the following situations:

- Shoulder dystocia
- Cord prolapse
- Category 1 caesarean sections
- When a baby requires resuscitation (at any time)

This list is not exhaustive and midwifery and obstetric staff must use their own judgment for other indications.

6.1 Further paediatrician attendance at delivery

The Paediatric Team should be asked to attend for the following situations:

- Significant meconium stained liquor
- Breech and other abnormal presentations
- Severe intrauterine growth retardation (estimated fetal weight less than 1.8kgs)
- Pre-term 29-34+6 weeks
- Delivery for pathological CTG
- Trial of instrumental delivery in theatre

The on-call Paediatric Consultant and Registrar should be called for:

- Preterm under 30 weeks
- Pre-term 22-23+6 weeks if parents wish resuscitation assessment at birth-movements, spontaneous respiratory efforts and heart rate response to mask ventilation
- By request of Labour Ward Co-ordinator or Consultant Obstetrician

For all non-emergency requests for Paediatricians, use the hospital bleep system to call the member of staff required. The on-call Paediatric Consultant should be informed of any newborn requiring high dependency or intensive care following delivery as they may be required to attend.

In situations where there is uncertainty about the gestation between 22-23; and the parents are requesting neonatal resuscitation, the Consultant Obstetrician should discuss the case with the on-call Paediatric Consultant and formulate a plan of care. (See appendix 2a & 2b)

6.2 Request paediatrician review following birth if:

- Baby is unwell or midwifery/parental concerns
- Abnormal neonatal observations
- Antenatal plan requires Paediatric input
- Major congenital abnormality
- Apgars <6 @10 mins
- Cord gases: PH <7.0 BE more negative than -16.
- Any baby that required resuscitation beyond inflation breaths, or requires continued episodes of stimulation, should have a senior paediatric review to determine cause /on-going plan.
- Persistently elevated lactate can be an indication for review.
- Any concerns will need to be escalated appropriately.

6.3 Where neonatal resuscitation is required in A&E

Staff must dial: '**2222'** and state "Neonatal Emergency, A&E"

This will summon:

- Paediatric tier 2 bleep holder (registrar or Advanced Nurse Practitioner)
- Paediatric tier 1 bleep holder (SHO or Advanced Nurse Practitioner)

And Mon-Fri, 9-5:

- Senior Neonatal Nurse

The on-call Paediatric Consultant can be contacted via switch board. If their presence is required they should be available within 30 minutes.

7.0 Equipment

7.1 Birth outside the hospital

Midwives attending women/people giving birth outside of the hospital environment will carry basic resuscitation equipment – stethoscope, bag, valve and mask for lung inflation. The bag, valve and mask system are single use only. This equipment will be checked that it is fit for use monthly and documented in the community midwives diary using a sticker.

For babies who need resuscitation 999 will be dialed and a paramedic ambulance requested for transfer into hospital.

All babies needing resuscitation should be brought straight to the Special Care Baby Unit (SCBU) at St. Richards and A&E at Worthing.

The Neonatal team will be notified prior to arrival.

7.2 Birth in hospital

Emergency equipment available for resuscitation of the newborn has been standardised throughout the Trust and is available within the maternity unit.

7.3 Maternity unit

Equipment provided is a Resuscitaire equipped to provide heat, light and blended air/oxygen for use in resuscitation (see appendix 4 and 5Appendix 5: Emergency Neonatal Trolley at SRH & Worthing).

Lung inflation is either via the bag and mask, open circuit or PEEP circuit; equipment for stabilization of airways; umbilical venous access.

The resuscitaires in the maternity service are the overall responsibility of the Trust Medical Devices Department (EBME) in regards for ensuring a programme of routine maintenance as well as demand repairs to ensure resuscitaires are fit for use and safe. The Medical Devices Policy provides guidance on reporting procedures for repairs.

Professionally it is the responsibility of designated healthcare professionals in care settings where neonatal resuscitation takes place to ensure that daily checks are documented on the appropriate recording system (NMC 2018).

Within the maternity service, staff undertake routine surface checks to ensure that they are restocked and checked after use in readiness for the next use. This must be recorded, dated and signed daily in the appropriate document for each resuscitaire, which is matched by the associated asset number on the document and on the resuscitaire.

At Worthing, there is a resuscitaire for the main theatre which is occasionally used when a 2nd obstetric theatre is required. This is checked by the maternity/neonatal service prior to maternal/birthing parent transfer to this theatre for birth. Main Theatre has the day-to-day responsibility for the resuscitaire with the professional responsibility remaining within the healthcare profession when checking it for immediate use.

8.0 Training

Training for staff working within the maternity service will be delivered in line with the UHSC073 Maternity TNA Policy.

Managers of nursing staff are responsible for ensuring they receive annual mandatory training to a level compatible with their clinical responsibilities and this is recorded on the Trust training database.

It is preferable for the labour ward co-ordinator to be Neonatal Life Support trained. If not, a plan for this to be achieved should be in place.

9.0 Monitoring/Audit

Admissions to the Special Care Baby Unit are monitored via patient safety, through processes such as ATAIN or HSIB referrals.

References

National Institute for Health and Clinical Excellence (2014) Intrapartum care: Care of healthy women and babies. Last updated 2017.

Newborn resuscitation and support of transition of infants at birth Guidelines 2021 | Resuscitation Council UK

Royal College of Anaesthetists, Royal College of Midwives, Royal College of Obstetricians and Gynaecologists, Royal College of Paediatrics and Child Health, 2007.

Safer Childbirth: Minimum Standards for the Organisation and Delivery of Care in Labour. London: RCOG Press.

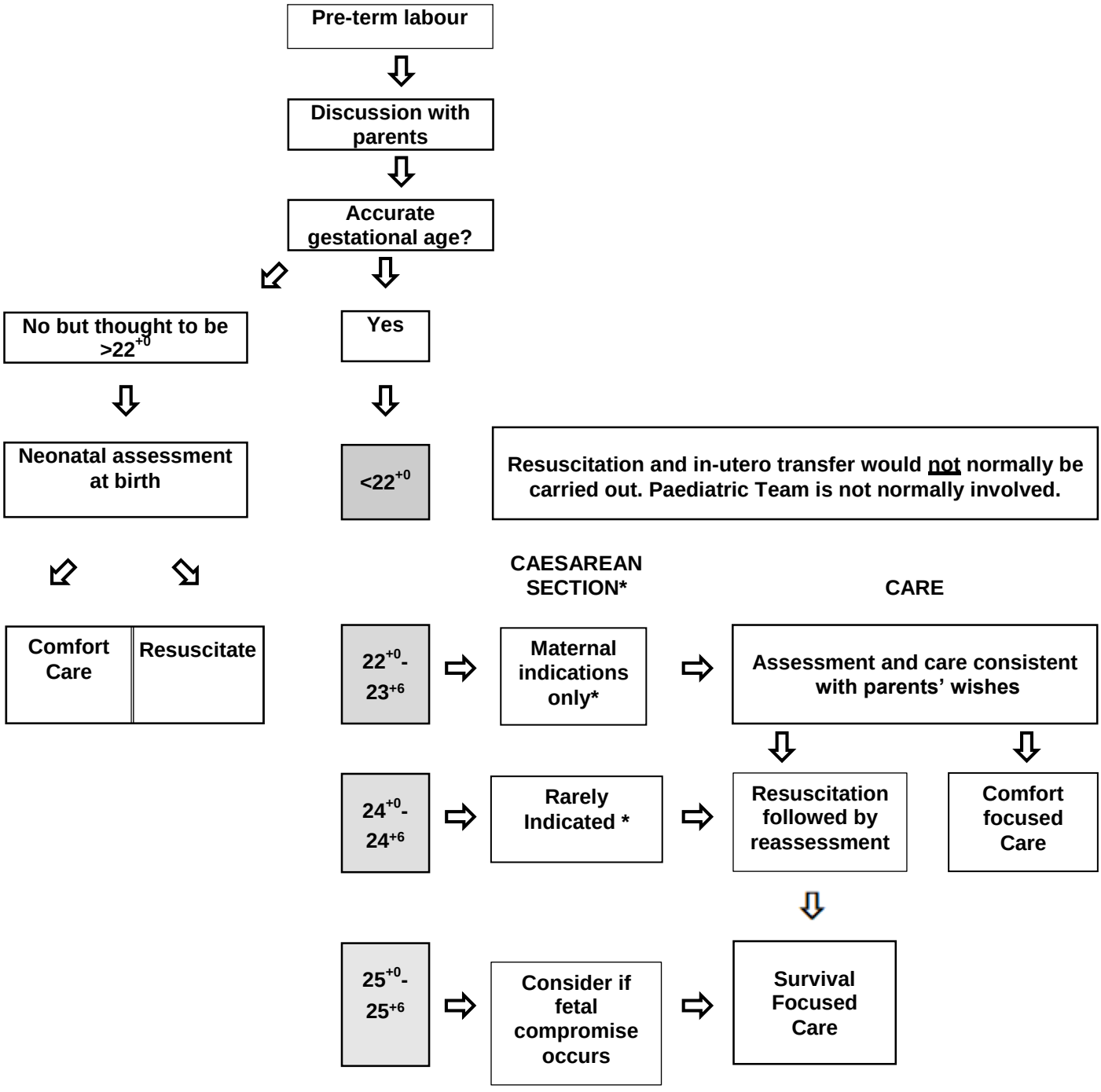
Resuscitation Council (UK) 2021, Neonatal Life Support Flow Chart

NMC (2018) Code of Professional standards of practice and behavior for nurses, midwives and nursing associates

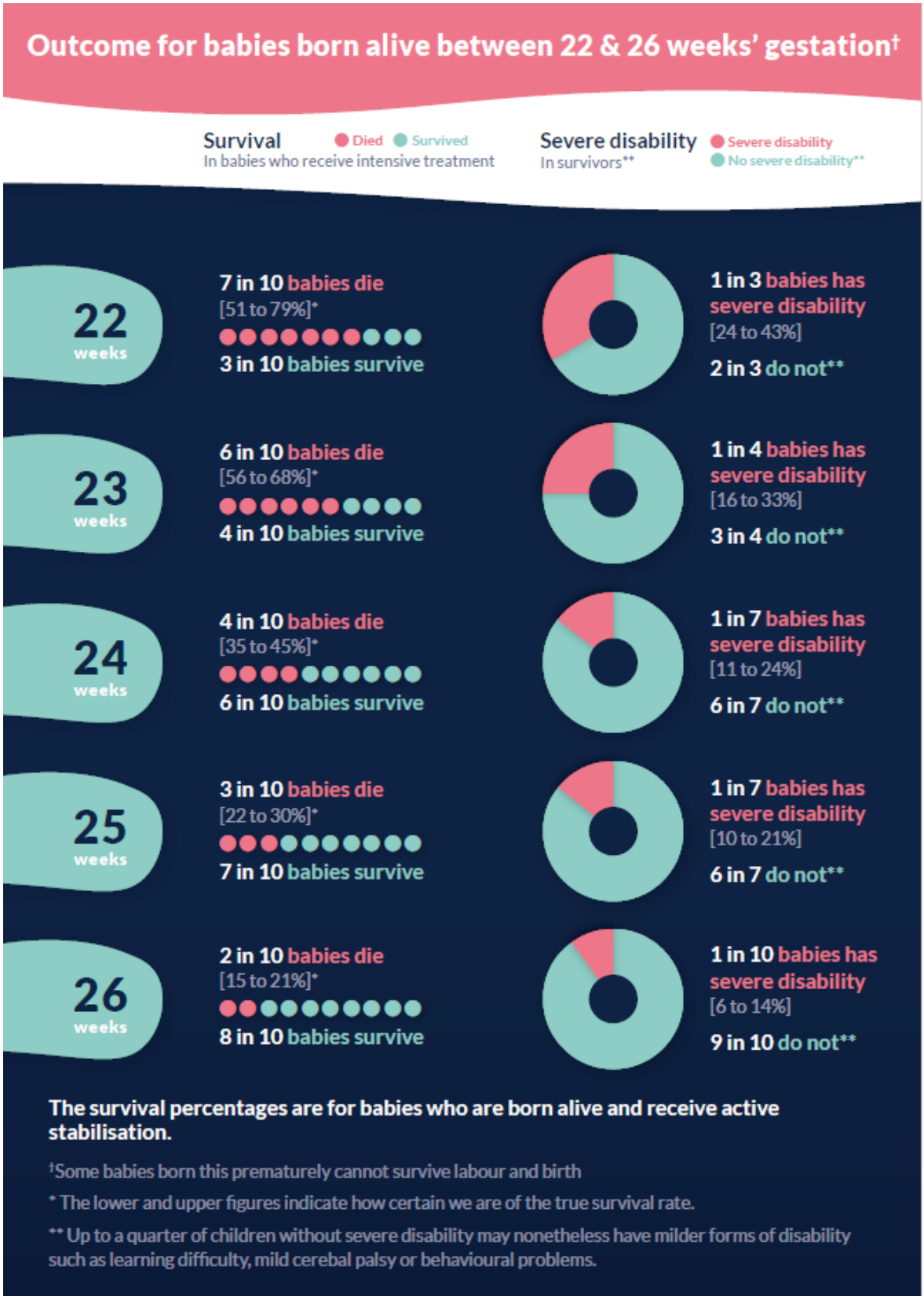
Appendix 1: Resuscitation Equipment & Drugs for Neonates

WT (kg)	Corrected gestation	Oral ETT (mid-trachea= T1 on CXR) Size/Length	ADRENALINE 1:10,000 0.2ml/kg IV/IO	BICARBONATE 2-4 ml/kg of 4.2% (1-2mmol/kg)	GLUCOSE 10% 2.5ml/kg	0.9% SODIUM CHLORIDE 10ml/kg in 10- 20s
0.5-0.75	22-24	2.5/5.5cm	0.2ml	1.5-2 ml	1.3ml	5ml
0.75-1.0	25-26	2.5/6 cm	0.2ml	2-3 ml	1.5ml	10ml
1-1.3	27-29	3.0/7 cm	0.2ml	2-4 ml	2.5ml	10ml
1.5	30-32	3.0/7 cm	0.2 ml	3-4 ml	3ml	15 ml
2.0	32-35	3.5/ 8cm	0.4ml	4-8 ml	5ml	20ml
3.0	35-Term	3.5/ 9cm	0.6ml	6-12 ml	7.5ml	30ml
4.0	Large term	3.5-4.0/ 10cm	0.8ml	10 ml	10ml	40ml

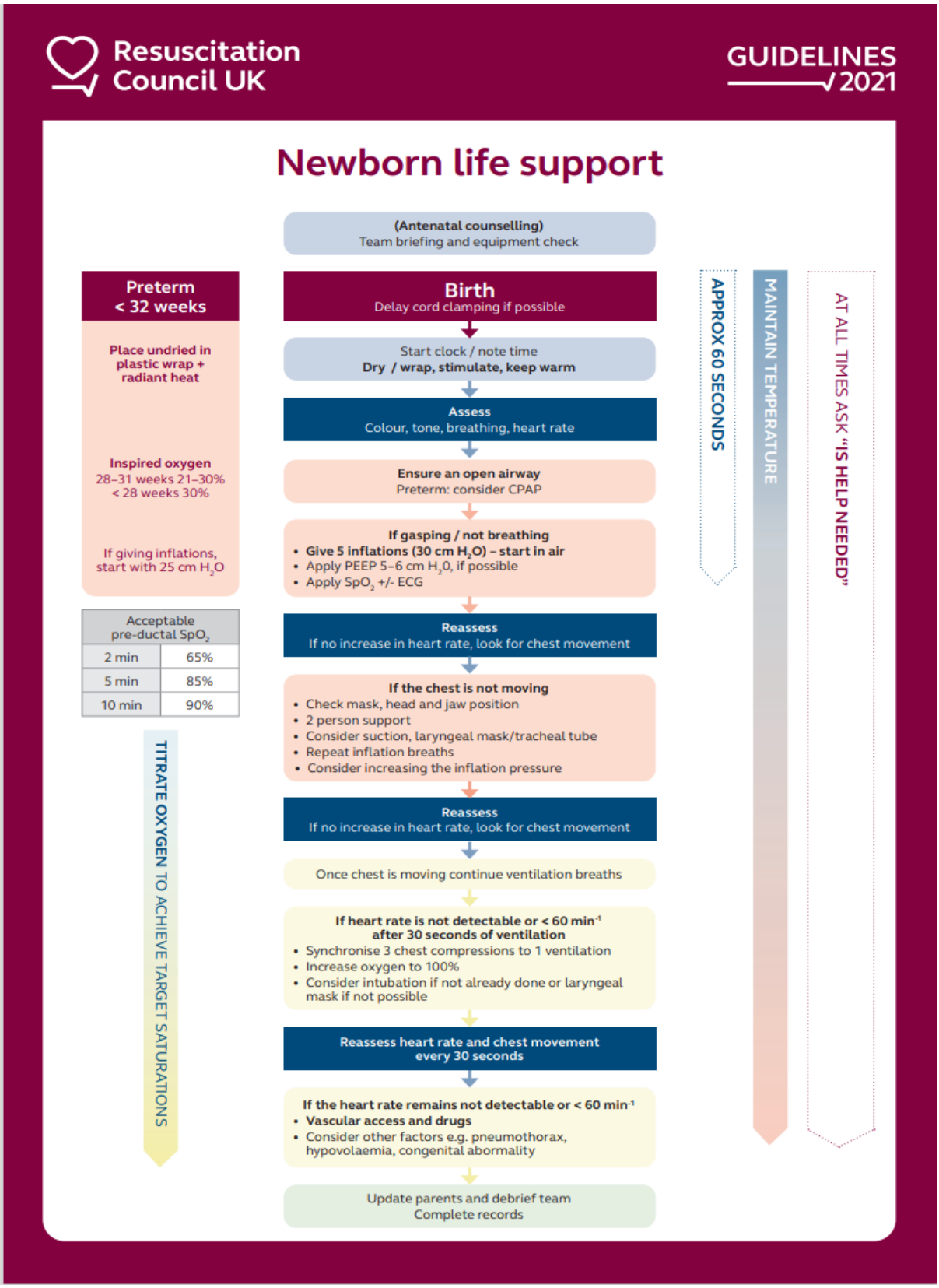
Appendix 2a: Management of babies born extremely pre-term at <26 weeks gestation Perinatal Network Guidelines



Appendix 2b: Outcomes for babies born alive between 22 & 26 weeks gestation



Appendix 3: Resuscitation Council UK (Newborn Life Support Flowchart (NLS 2021))



Appendix 4: Resuscitaire Contents Based on NLS Guidelines

RESUSCITAIRE CHECKLIST
ON TOP
Light, heater and stop clock working
Air and oxygen cylinders >4000 kPa (1/4 full)- disconnect wall oxygen to check **(Keep cylinders turned off until delivery)** If blender, set at 21- 30% O2
Oxygen tubing present
Oxygen supply working (IPPV to 30cmsH20)
Face mask size 1 attached / neopuff
Argyle mini yankauer suction tube attached to suction tubing
Suction working (pressure to10kpa) **(Suction bottles and tubing are single use only)**
4 towels
Stethoscope
IN DRAWER
Argyle (black 10Fr) suction catheter X1
Argyle mini yankauer X1
Face mask size 0 x1
2 laryngoscopes handles with spare batteries
2 disposable laryngoscope straight miller blades sizes 0 and 1 (tested and working)**(Blades are single use only)**
Oropharyngeal Guedal Airway size 00, size 0 and size 1
ETT size 2.5 x 2, each with size 2.5 clamp attached
ETT size 3.0 x 2, each with size 3.0 clamp attached
ETT size 3.5 x 2, each with size 3.5 clamp attached
ETT size 4.0 x 2, each with size 4.0 clamp attached
Intubation stylets x 2
Umbilical cord clamp
Hats (various sizes with and without ties)

EMERGENCY TROLLEY & DRUG BOX (Located in room 1 on Special Care Baby Unit at SRH)

NEONATAL BOX containing emergency drugs and equipment (Located in clinical room and Obstetric Theatre at Worthing)

Appendix 5: Emergency Neonatal Trolley at SRH & Worthing

Tray 1: Airway
Laryngoscope Handle X 2
2 Disposable Straight Miller Blades one Size 1 one Size 0 for Babies < 1000g
Sterile Endotracheal Tubes with Endotracheal Clamp sizes: (two of each) 2.5mm, 3.00mm, 3.5mm, 4.00mm
Portex Tracheal Intubation Stylet X 2

Tray 2: Airway /Breathing
Oropharyngeal (Guedal) Airway 000, 00, 0, 1, 2
Ambi Bag 500ml
Masks sizes 0, 01, 2
CO2 Detector

Tray 3: Circulation	
Sterile Artery Forceps X 2	Sterile blade size 23 X 2
Sterile Medical Probe	Caruso mayo scissors
Luer Lock 3 – way tap	Small stick scissors
Syringes sizes: 2ml, 5ml, 10ml X 1	Needle holder
Umbilical Catheter sizes 3.5, 4, 5 X 1	Cord clamp clipper
Green needle X 1	Ethicon Nylon tape X 2
Sterile disposable scalpel	Biosyn suture x2 (for UVC)
Incubator feeding tubes sizes 05, 06 and 08	Neoflon size 24 GA x2
IV Catheter Radiopaque size 24G	Dressing and Elastoplast

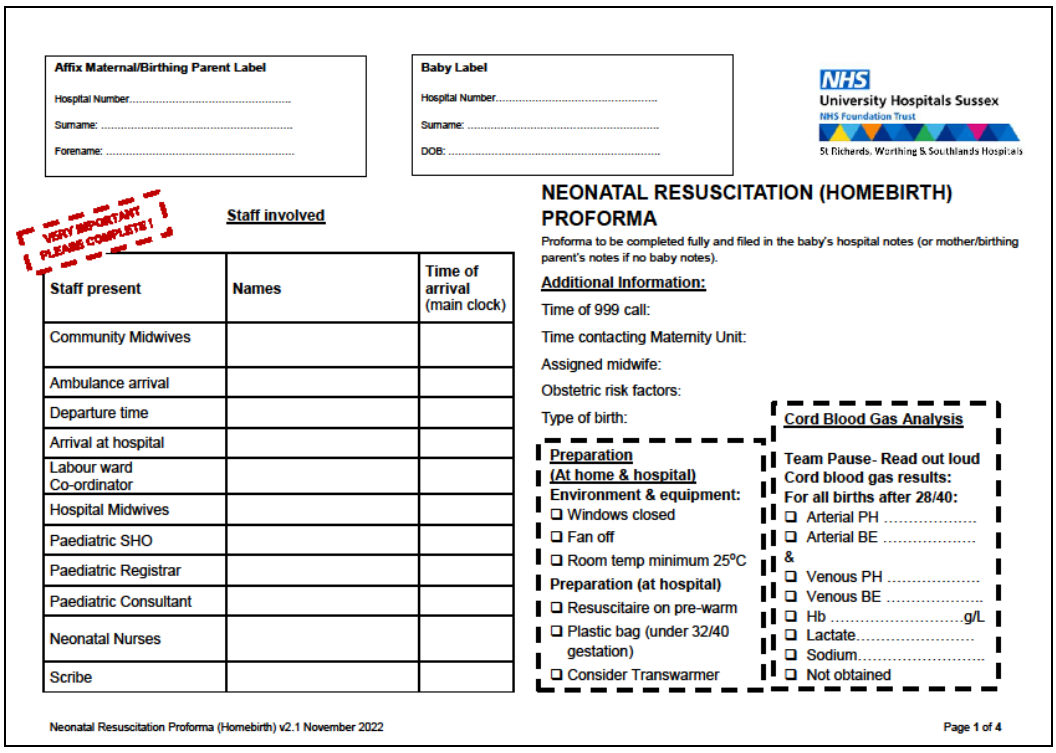
Tray 4
Plastic bags x2
Hat sizes: Small, Medium, Large x2

Trolley base
Drug box
Saturation monitor (kept plugged in)
Saturation probes and posies

Advanced Airway Box on SCBU

Appendix 6: Neonatal Resuscitation Proformas

PLEASE DO NOT PRINT FROM GUIDELINE



Affix Maternal/Birthing Parent Label
Hospital Number.....
Surname: .....
Forename: .....

Baby Label
Hospital Number.....
Surname: .....
DOB: .....

NHS University Hospitals Sussex NHS Foundation Trust St Richards, Worthing & Southlands Hospitals

VERY IMPORTANT PLEASE COMPLETE !

Staff involved

Staff present	Names	Time of arrival (main clock)
Community Midwives		
Ambulance arrival		
Departure time		
Arrival at hospital		
Labour ward Co-ordinator		
Hospital Midwives		
Paediatric SHO		
Paediatric Registrar		
Paediatric Consultant		
Neonatal Nurses		
Scribe		

NEONATAL RESUSCITATION (HOMEBIRTH) PROFORMA

Proforma to be completed fully and filed in the baby's hospital notes (or mother/birthing parent's notes if no baby notes).

Additional Information:

Time of 999 call:

Time contacting Maternity Unit:

Assigned midwife:

Obstetric risk factors:

Type of birth:

Preparation
(At home & hospital)
Environment & equipment:
❑ Windows closed
❑ Fan off
❑ Room temp minimum 25°C
Preparation (at hospital)
❑ Resuscitaire on pre-warm
❑ Plastic bag (under 32/40 gestation)
❑ Consider Transwarmer

Cord Blood Gas Analysis
Team Pause- Read out loud
Cord blood gas results:
For all births after 28/40:
❑ Arterial PH .....
❑ Arterial BE .....
&
❑ Venous PH .....
❑ Venous BE .....
❑ Hb .....g/L
❑ Lactate.....
❑ Sodium.....
❑ Not obtained

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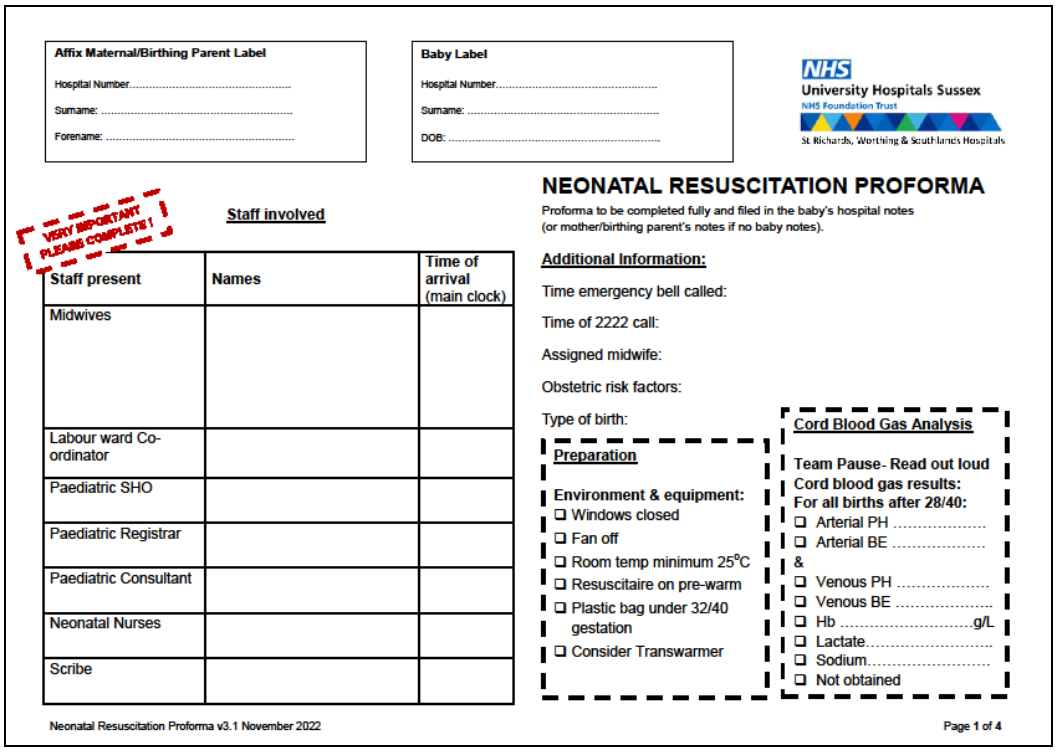

Affix Maternal/Birthing Parent Label
Hospital Number.....
Surname: .....
Forename: .....

Baby Label
Hospital Number.....
Surname: .....
DOB: .....

NHS University Hospitals Sussex NHS Foundation Trust St Richards, Worthing & Southlands Hospitals

VERY IMPORTANT PLEASE COMPLETE !

Staff involved

Staff present	Names	Time of arrival (main clock)
Midwives		
Labour ward Co-ordinator		
Paediatric SHO		
Paediatric Registrar		
Paediatric Consultant		
Neonatal Nurses		
Scribe		

NEONATAL RESUSCITATION PROFORMA

Proforma to be completed fully and filed in the baby's hospital notes (or mother/birthing parent's notes if no baby notes).

Additional Information:

Time emergency bell called:

Time of 2222 call:

Assigned midwife:

Obstetric risk factors:

Type of birth:

Preparation
Environment & equipment:
❑ Windows closed
❑ Fan off
❑ Room temp minimum 25°C
❑ Resuscitaire on pre-warm
❑ Plastic bag under 32/40 gestation
❑ Consider Transwarmer

Cord Blood Gas Analysis
Team Pause- Read out loud
Cord blood gas results:
For all births after 28/40:
❑ Arterial PH .....
❑ Arterial BE .....
&
❑ Venous PH .....
❑ Venous BE .....
❑ Hb .....g/L
❑ Lactate.....
❑ Sodium.....
❑ Not obtained

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