Mid Essex Hospital Services NHS
NHS Trust

NEONATAL RESUSCITATION	CLINICAL GUIDELINES Register No: 07074 Status: Public

Developed in response to:	Intrapartum NICE Guidelines UK Resuscitation Council
CQC Fundamental Standards:	11, 12

Consulted With	Post/Committee/Group	Date
Alison Cuthbertson	Clinical Director for Women's and Children's Division	May 2017
Anita Rao	Consultant for Obstetrics and Gynaecology	
Miss Dutta	Consultant for Obstetrics and Gynaecology	
Dr Agrawal	Consultant Paediatrician	
Alison Cuthbertson	Acting Head of Midwifery for Women's and Children's Services	
Ros Bullen-Bell	Lead Midwife Acute In-patient Services	
Chris Berner	Lead Midwife Clinical Governance	
Toni Laing	Lead Nurse for Neonatal	
Susie Denhart	Practice Development Midwife	
Sarah Moon	Specialist Midwife for Guideline and Audit	
Sharon Kippen	Senior Midwife Postnatal Ward	
Deborah Lepley	Senior Librarian, Warner Library	
Professionally Approved By		
Dr. Hassan	Consultant Lead for Risk Management	May 2017
Anita Rao	Lead Obstetric and Gynaecology Consultant	May 2017

Version Number	5.1
Issuing Directorate	Obstetrics and Gynaecology
Ratified By	DRAG Chairman's Action
Ratified On	22nd November 2017
Trust Executive Sign Off Date	December 2017/ January 2018
Next Review Date	October 2020
Author/Contact for Information	Sarah Moon, Specialist Midwife for Guidelines and Audit
Policy to be followed by	**Midwives, Obstetricians, Paediatricians**
Distribution Method	Intranet & Website. Notified on Staff Focus
Related Trust Policies (to be read in conjunction with)	04071 Standard Infection Prevention 04072 Hand Hygiene 06036 Guideline for Maternity Record Keeping 07074 Neonatal resuscitation 09079 Management of Normal Labour and Prolonged Labour in Low risk Patients 09113 Calling Paediatric Staff and Obtaining Paediatric Referral 04259 Management of meconium stained liquor'

Document History Review:

Review No	Reviewed by	Issue Date
1.0	Julie Bishop	January 2004
2.0	Sharon Pilgrim	December 2007
2.1	Equality and Diversity, audit and monitoring.	August 2009
2.2	Sharon Pilgrim	November 2010
3.0	Sharon Pilgrim and Sarah Moon – clarification point 6.0	July 2012
3.1	Sarah Moon	July 2012
3.2	Sharon Pilgrim and Sarah Moon – clarification to 6.0; 7.0	October 2012
3.3	Sarah Moon – clarification to Appendix B	February 2013
3.4	Sarah Moon – clarification to 6.2, 6.4, 6.5, 14.1 and Appendix B	July 2013
3.5	Sarah Moon – clarification to Appendix B	October 2013
4.0	Sharon Pilgrim	March 2014
4.1	Sharon Pilgrim clarification to point 6.9; 8.0; Appendices A and E	4 April 2017
5.0	Sarah Moon	20th December 2017
5.1	Su Poole - clarification to Appendix E	2nd May 2019

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1.0 Purpose

1.1 To Identify the at risk groups of babies who may require active resuscitation of the Newborn

1.2 By identifying at risk groups the equipment, staff and environment can be prepared for resuscitation

1.3 To prepare midwives and medical staff for the resuscitation process by using the accepted Algorithm. (Refer to Appendix A)

2.0 Equality and Diversity

2.1 Mid Essex Hospital Services NHS Trust is committed to the provision of a service that is fair, accessible and meets the needs of all individuals.

3.0 At Risk Groups

3.1 Refer to the following list for at risk groups:

- Prematurity in particular gestations of <33 weeks
- The presence of significant MSL or oligohydramnios
  (Refer to the guideline for the 'Management of meconium stained liquor'; register number 04259)
- Asphyxia which may present as late decelerations or fetal bradycardia/tachycardia on the cardiotocograph (CTG) tracing; or in the presence of cord prolapse or placental abruption
- Known fetal abnormality
- Multiple births

4.0 Staff Responsibilities

4.1 The clinical director is the link paediatrician responsible for the clinical standards in relation to the care of the newborn.

5.0 Emergency /Code Blue

5.1 Code Blue is defined as an emergency situation involving a collapsed baby that requires an urgent 'crash call' response using the emergency call number **4444** followed by:

- Specify code **BLUE**
- Give location to switchboard (e.g. A4, Maternity –Labour Ward or Postnatal Ward)
  (Refer to Appendix B)

6.0 Resuscitation Equipment

(Refer to Appendix C)

6.1 Resuscitation equipment should be available in all care settings as follows:

- Labour Ward
- Co-located Birthing Unit (Broomfield Hospital)
- Postnatal Ward
- Day Assessment Unit
- Midwife-led Units (Braintree/Maldon)
- Accident and Emergency (Broomfield Hospital)
- Obstetric theatres 1 and 2 located on Labour Ward
- Community Midwives

6.2 Labour Ward (to include the obstetric theatres) has 4 separate neonatal trolleys that are stocked with neonatal drugs and neonatal equipment for resuscitation and intubation. The 2 Labour Ward neonatal trolleys are located in the equipment room.

6.3 The Panda resuscitaire located on the Day Assessment Unit; in the triage room has 1 separate neonatal trolley that is fully stocked with neonatal drugs and neonatal equipment for resuscitation and intubation. The neonatal trolley is located in the clean utility room.

6.4 The Panda resuscitaire located on the Postnatal Ward; in the neonatal resuscitaire room has 1 separate neonatal trolley that is fully stocked with neonatal drugs and neonatal equipment for resuscitation and intubation. The neonatal trolley is located in the clean utility room.

6.5 The Panda resuscitaire and neonatal equipment should be checked on a daily basis in the areas outlined above in point 6.1and recorded and signed off on the neonatal record sheets provided.

6.6 It is the overall responsibility of the senior midwives in all care settings to ensure that the resuscitation equipment used by the maternity service is checked, stocked and fit for purpose on a daily basis. In addition, it is the individual midwives' responsibility to ensure that resuscitation equipment within each care setting is fit for purpose on a daily basis.

6.7 All community midwives carry basic resuscitation equipment including:

- Guedel airway
- Penlon bag
- Portable oxygen cylinder

6.8 Community midwives should check their neonatal equipment daily as outlined in point 6.7 and this should be recorded and signed off on the statistical sheets provided.

6.9 For WJC community midwives at St Michael's Hospital, Braintree and St. Peters community midwives at Maldon; the neonatal equipment is checked fit for purpose and stored in 'pool cars'; the community midwife should check their neonatal equipment daily as outlined in point 6.7. This daily check should be recorded and signed off on the neonatal sheets provided.

6.10 For the Midwife-led Units: WJC at St Michael's Hospital, Braintree; and St Peters, Maldon; the Panda resuscitaires and neonatal equipment should be checked on a daily basis in the areas outlined above in point 6.1and recorded and signed off on the neonatal record sheets provided.
(Refer to Appendix D)

7.0 Preparation before Delivery

7.1 Relevant staff with new born life support skills should be available to attend deliveries, this includes:

- Paediatric Senior House Officer and Registrar (24 hour cover bleep holder)
- The Advanced Neonatal Nurse practitioner (ANNP)
- Paediatric Consultant (24 hour cover availability for the via switchboard)

7.2 Inform the above team as well as:

- Inform and update the Labour Ward Co-ordinator
- Inform the Neonatal Unit if an admission is anticipated

7.2 Ensure the room is warm.

7.3 Prepare resuscitaire and switch the heater on. Check equipment making sure the size of masks, tubes etc is appropriate for the gestation.

7.4. Have plastic bag available if below 30 weeks gestation.

7.6 Check drugs are available.

7.7 Explain to parents what is happening.

7.8 When entering the room introduce yourself to parents if appropriate.

7.9 For uncompromised term and preterm infants, a delay in cord clamping of at least one minute is recommended. However, for infants requiring resuscitation, resuscitative intervention remains the immediate priority.

8.0 Pathway

8.1 Start the clock.

8.2 Dry and cover unless 30 weeks or below then before drying, place straight into a plastic bag covering the body and head with bag or a hat. While doing this assess the Apgar. Change wet towels immediately

8.3 Babies 30 weeks gestation and below should be completely covered up to their necks in a food-grade plastic wrap or bag, without drying, immediately after birth. They should then be nursed under a radiant heater and stabilised. They should remain wrapped until their

temperature has been checked after admission. For these infants the delivery room temperatures should be at least 26°C.

8.4 Thermoregulation of preterm babies delivered at home should be supported by wrapping in polythene and placed next to a warm object - such as mothers' skin – and covered with a warm towel. Consideration also needs to be given to increasing ambient temperature and eliminating draughts. They should be transported in a warm vehicle.

8.5 Assess colour, tone, breathing and heart rate and continue to reassess these observations every 30 seconds throughout resuscitation. The responsible practitioner should ensure that the neonate is assessed and the Apgar score is accurately calculated and documented in the Baby Delivery Record.
(Refer to Appendix B)

8.6 Call for help now or at any time in the resuscitation process.

8.7 If the baby is not breathing open the airway by placing the head in the neutral position and reassess.

8.8 If still not breathing give 5 inflation breaths using a bag and appropriate sized mask or mask and T-piece. Each breath should last 2-3 seconds and exert 30cms/H20 (lower pressure should be given to preterm infants) and reassess if no increase in heart rate look for chest movement.

8.9 For term infants, air should be used for resuscitation at birth. If, despite effective ventilation, oxygenation (ideally guided by pulse oximetry) remains unacceptable, use of a higher concentration of oxygen should be considered.

8.10 Preterm babies less than 32 weeks gestation may not reach the same arterial blood oxygen saturations in air as those achieved by term babies. Therefore blended oxygen and air should be given judiciously and its use guided by pulse oximetry. If a blend of oxygen and air is not available use what is available.

8.11 If no chest movement recheck head position, apply jaw thrust and repeat inflation breaths. Reassess if no increase in heart rate repeat sequence as in point 8.8. Consider using an oropharyngeal airway or 2 person jaw thrust. Is the airway clear - consider suction.

8.12 When chest is moving and heart rate is satisfactory give ventilation breaths at a rate of approximately 30 per minute until the baby is breathing adequately.

8.13 If heart rate is below 60 bpm with adequate chest movement give 1 round of ventilation breaths and reassess prior starting cardiac compressions, if there remains no improvement in heart rate start chest compressions at 3 compressions to one ventilation, at a rate to give 120 events per minute. Position hands as to grip the chest with the thumbs positioned on the sternum at the level of an imaginary line drawn between the nipples and the fingers under the back, Compress the chest quickly by about one third. Reassess every 30 seconds.

8.14 If the heart rate increases stop compressions and continue ventilation breaths until the baby is breathing adequately.

8.15 If there is no response with effective ventilation and cardiac compressions, resuscitation drugs should be administered. Intravenous access should be obtained using the umbilical vein for central administration.

8.16 Newly born infants born at term or near term with evolving moderate to severe hypoxic – ischaemic encephalopathy should, where possible, be treated with therapeutic hypothermia.

8.17 After all resuscitations all actions, procedures and drugs must be fully documented in the maternal notes.

9.0 Drugs

9.1 Epinephrine (Adrenaline) 1:10,000

- If given then the intravenous route is recommended using a dose of 0.1ml - 0.3 ml/kg (10-30 mcg kg)

- If the tracheal route is used, it is likely that a dose of at least 0.5ml – 1ml/kg (50-100 mcg kg) will be needed to achieve a similar effect to 10 mcg/kg intravenously

9.2 Sodium Bicarbonate 4.2% (8.4% can be diluted ml to 1:1 with normal saline 0.9%)

- Dose 1-2 mmols/kg (2 – 4 mls/kg of 4.2 %)
- If there is no response to epinephrine, giving sodium bicarbonate prior to the 2nd dose may help as the epinephrine action is reduced if acidaemia is present

9.3 Dextrose 10% 250mg/kg (2.5ml/kg).

10.0 Management of Significant Meconium Stained Liquor (MSL)

(Refer to the guideline for the 'Management of meconium stained liquor'; register number 04259)

10.1 If significant MSL is present and the baby is crying and breathing well do not suction.

10.2 If presented with a floppy, apnoeic baby born through significant MSL it is reasonable to inspect the pharynx rapidly to remove potential obstructions. If appropriate expertise is available, tracheal intubation and suction may be useful. However, if there is no-one present with the correct expertise or if attempted intubation is prolonged or unsuccessful, start mask ventilation, particularly if there is persistent bradycardia.

11.0 Cord Bloods

11.1 Cord blood gases should be taken routinely where a baby has a poor apgar assessment at delivery.
('Management of Normal Labour and Prolonged Labour in Low risk Patients'; register number 09079; and 09113 Guidelines for 'Calling Paediatric Staff and Obtaining Paediatric Referral'; register number 09113)

12.0 Staff and Training

12.1 All midwifery and obstetric staff must attend yearly mandatory training which includes skills and drills training, to include attending a course in neonatal resuscitation.
(Refer to 'Mandatory training policy for Maternity Services (incorporating training needs analysis. Register number 09062)

12.2 All midwifery and obstetric staff are to ensure that their knowledge and skills are up-to-date in order to complete their portfolio for appraisal.

12.3 Midwifery staff undertaking neonatal resuscitation should have annual updates and in house training or should attend the Neonatal Life Support course.

12.4 Paediatricians and neonatal staff should attend the Neonatal Life Support course four yearly.

13.0 Professional Midwifery Advocates

13.1 Professional Midwifery Advocates provide a mechanism of support and guidance to women and midwives. Professional Midwifery Advocates are experienced practising midwives who have undertaken further education in order to supervise midwifery services and to advise and support midwives and women in their care choices.

14.0 Infection Prevention

14.1 All staff should follow Trust guidelines on infection prevention by ensuring that they effectively 'decontaminate their hands' before and after each procedure.

14.2 All staff should ensure that they follow Trust guidelines on infection prevention. All invasive devices must be inserted and cared for using High Impact Intervention guidelines to reduce the risk of infection and deliver safe care. This care should be recorded in the Saving Lives High Impact Intervention Monitoring Tool Paperwork (Medical Devices).

15.0 Audit and Monitoring

15.1 Audit of compliance with this guideline will be considered on an annual audit basis in accordance with the Clinical Audit Strategy and Policy (register number 08076), the Corporate Clinical Audit and Quality Improvement Project Plan and the Maternity annual audit work plan; to encompass national and local audit and clinical governance identifying key harm themes. The Women's and Children's Clinical Audit Group will identify a lead for the audit.

15.2 Documentation should describe the process for ensuring that all appropriate maternal screening tests are offered, undertaken and reported on during the antenatal period, which as a minimum must include a description of the:

- Identification of a designated link paediatrician for the Labour Ward and Neonatal Service, responsible for the clinical standards in relation to the care of the newborn
- Process for documenting that the resuscitation equipment used by the Maternity Service is checked, stocked and thereby fit for use in all care settings
- Deliveries to be attended by a clinician (doctors, advanced neonatal nurse practitioner, midwives) with newborn life support skills
- Process for the availability of a clinician with newborn life support skills at a delivery if required
- Process for 24 hour availability in obstetric units (on site within 30 minutes), of a consultant paediatrician (or equivalent staff and associate specialist grade) trained and assessed as competent in newborn life support skills
- Maternity service's expectations in relation to staff training, including newborn life support skills, as identified in the training needs analysis
- Process for monitoring compliance with all of the above requirements, review of results and subsequent monitoring of action plans.

15.3 A review of a suitable sample of health records of patients to include the minimum requirements as highlighted in point 14.2 will be audited. A minimum compliance 75% is required for each requirement. Where concerns are identified more frequent audit will be undertaken.

15.4 The findings of the audit will be reported to and approved by the Multi-disciplinary Risk Management Group (MRMG) and an action plan with named leads and timescales will be developed to address any identified deficiencies. Performance against the action plan will be monitored by this group at subsequent meetings.

15.5 The audit report will be reported to the monthly Directorate Governance Meeting (DGM) and significant concerns relating to compliance will be entered on the local Risk Assurance Framework.

15.6 Key findings and learning points from the audit will be submitted to the Patient Safety Group within the integrated learning report.

15.7 Key findings and learning points will be disseminated to relevant staff.

16.0 Guideline Management

16.1 As an integral part of the knowledge, skills framework, staff are appraised annually to ensure competency in computer skills and the ability to access the current approved guidelines via the Trust's intranet site.

16.2 Quarterly memos are sent to line managers to disseminate to their staff the most currently approved guidelines available via the intranet and clinical guideline folders, located in each designated clinical area.

16.3 Guideline monitors have been nominated to each clinical area to ensure a system whereby obsolete guidelines are archived and newly approved guidelines are now downloaded from the intranet and filed appropriately in the guideline folders. ‘Spot checks’ are performed on all clinical guidelines quarterly.

16.4 Quarterly Clinical Practices group meetings are held to discuss ‘guidelines’. During this meeting the practice development midwife can highlight any areas for further training; possibly involving ‘workshops’ or to be included in future ‘skills and drills’ mandatory training sessions

17.0 Communication

17.1 A quarterly ‘maternity newsletter’ is issued and available to all staff including an update on the latest ‘guidelines’ information such as a list of newly approved guidelines for staff to acknowledge and familiarise themselves with and practice accordingly.

17.2 Approved guidelines are published monthly in the Trust’s Staff Focus that is sent via email to all staff.

17.3 Approved guidelines will be disseminated to appropriate staff quarterly via email.

17.4 Regular memos are posted on the Guideline and Audit notice boards in each clinical area to notify staff of the latest revised guidelines and how to access guidelines via the intranet or clinical guideline folders.

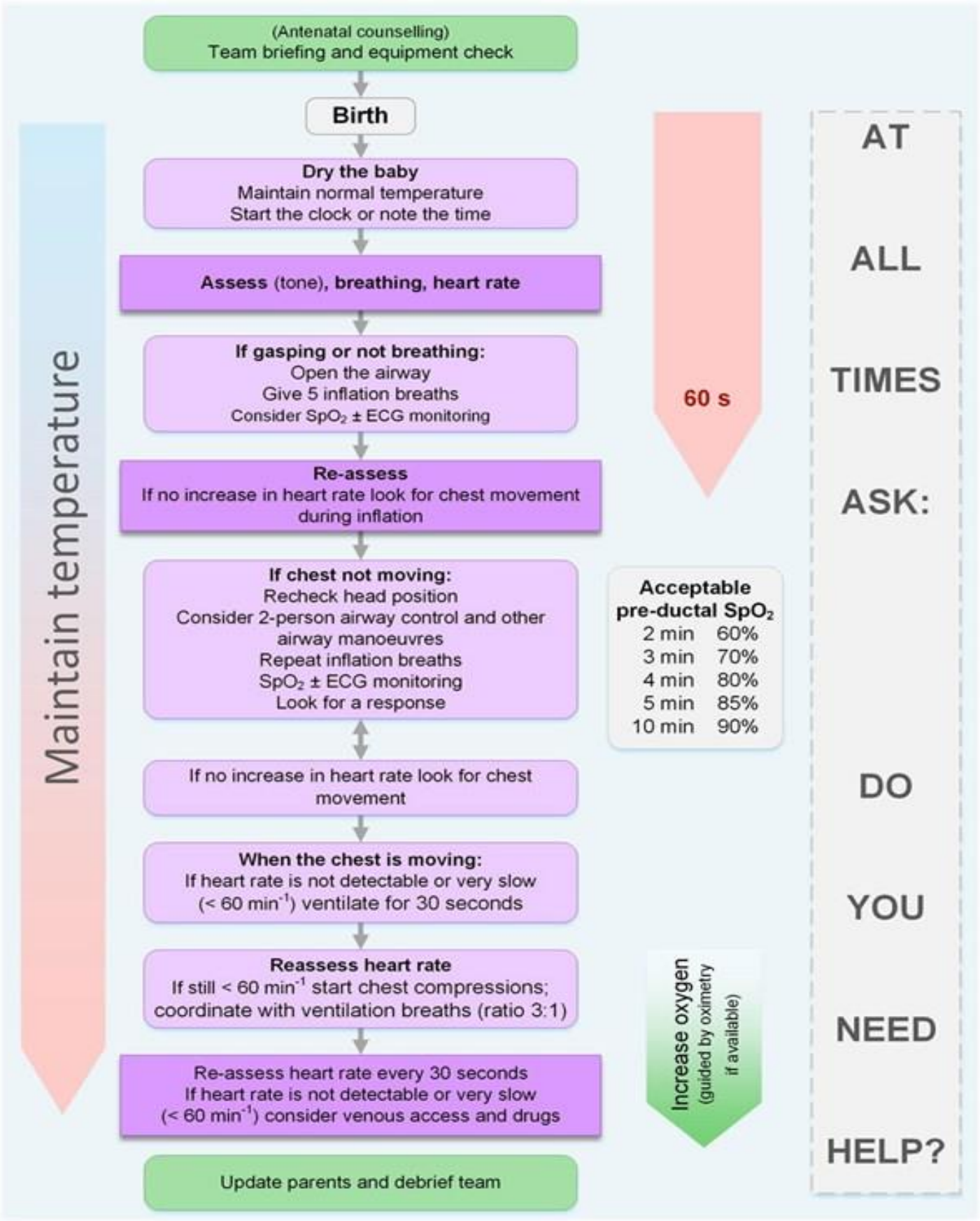
18.0 References

Resuscitation Council, UK (2015) Newborn Life support Provider Manual, London.

National Institute for Clinical Excellence (2007) Intrapartum Care: care of healthy women and their babies during childbirth. NICE: London. September

Champion P in Davies l; McDonald S (2008). Examination of the Newborn and Neonatal Health. A Multidimensional Approach. Churchill Livingstone.

Appendix A


(Antenatal counselling)
Team briefing and equipment check
Birth
Dry the baby
Maintain normal temperature
Start the clock or note the time
Assess (tone), breathing, heart rate
If gasping or not breathing:
Open the airway
Give 5 inflation breaths
Consider SpO2 ± ECG monitoring
Re-assess
If no increase in heart rate look for chest movement during inflation
If chest not moving:
Recheck head position
Consider 2-person airway control and other airway manoeuvres
Repeat inflation breaths
SpO2 ± ECG monitoring
Look for a response
If no increase in heart rate look for chest movement
When the chest is moving:
If heart rate is not detectable or very slow (< 60 min-1) ventilate for 30 seconds
Reassess heart rate
If still < 60 min-1 start chest compressions; coordinate with ventilation breaths (ratio 3:1)
Re-assess heart rate every 30 seconds
If heart rate is not detectable or very slow (< 60 min-1) consider venous access and drugs
Update parents and debrief team
Maintain temperature
60 s
Acceptable pre-ductal SpO2
2 min 60%
3 min 70%
4 min 80%
5 min 85%
10 min 90%
Increase oxygen (guided by oximetry if available)
AT
ALL
TIMES
ASK:
DO
YOU
NEED
HELP?

Appendix B

The Five Criteria of the Apgar Score

Apgar Score								
Apgar scoring	**0**	**1**	**2**	1 min	3 min	5 min	7 Min	10 min
Heart Beat	Absent	Less than 100	More than 100					
Respirations	Absent	Slow, irregular	Good strong cry					
Response to Painful Stimulus	None	Grimace	Cry					
Muscle Tone	Limp	Some limb flexion	Active movements					
Colour	White, blue or pale	Blue extremities, pink trunk	Pink all over					
Totals								

Appendix C

Mid Essex Hospital Services NHS Trust
Women's, Children's and Sexual Health Directorate

There are two types of emergencies (code RED and code BLUE) that require urgent 'crash call' responses using the new 4444 emergency call number.

Initiating an emergency

9 Co-ordinator/senior staff member to initiate code
10 Dial 4444
11 Specify code **RED** or code **BLUE** (see below criteria)
12 Give location to switchboard (e.g. A4, Maternity – Delivery Suite or Postnatal Ward)

Code RED for obstetric emergencies

- Grade 1 caesarean section
- Major/ massive haemorrhage
- Maternal fitting
- Cord prolapse

Code RED switchboard will fast bleep the following:

- Labour ward co-ordinator (#6555 2017)
- On call obstetric registrar
- On call obstetric SHO
- On call anaesthetist
- On call anaesthetic assistant
- On call paediatric registrar
- On call paediatric SHO
- Theatre scrub team

Code BLUE for collapsed baby

Code BLUE switchboard will fast bleep the following:

- Labour ward co-ordinator (#6555 2017)
- On call paediatric registrar
- On call paediatric SHO
- Advanced neonatal nurse practitioner (Mon – Fri, 08:00 – 21:00 only)
- Resus officer (will only attend if available)

****** In the event of a cardiac arrest you will still need to dial 2222******

Amended: October 2013

Appendix D

Labour Ward, DAU and Postnatal Ward Neonatal Resuscitation Trolley Checklist

Top Drawer: Intubation	• Guedel airways x1 size 1(white) 0(grey) 00 (blue) 000 (pink) • Endotracheal tube (ET) tubes x2 sizes 2.0, 2.5, 3.0, 3.5, 4.0 • ET introducers x2 size 2 • Neofit ET securing grip x2 • Laryngoscope with spare batteries and bulbs • Transpore tape • Facemasks x1 size 0, 1 and 2 • Plastic bags for extreme premature babies • Pen torch • Surfactant administration set (syringe 5ml x2, disposable scissors x2, NG tubes 6 Fr x2) • Suction catheters size 8 x2, size 10 x2 • Yanker sucker x2
2nd Drawer: Umbilical arterial/venous catheter (UAC/UVC)	• Syringes x2 1ml, 2ml, 5ml, 10ml and 20ml • Cord clamps • Normal saline 0.9% 100ml • 3-way tap • Blades x2, size 11 • Stitch cutter • Vicryl • Syringes x2 50ml luer lock • UAC X1 size 3.5 and 4.0 • Needles x5 green and orange • Sleek • Normal saline 0.9% for flush
3rd Drawer: Cannulation and emergency drugs	• Sterile scissors • Needles x5 green, orange • Steristrips x5 • Cannula x5 • Syringes x5 1ml, 2ml, 5ml, 10ml and 20ml • Neonatal drugs • Sterets • Spot plasters • IV dressing
4th Drawer: Fluids	• Glucose 10% 500ml x1
Bottom Drawer: Miscellaneous	• Hat • Paediatric stethoscope • Spinal pack • Sterile gloves x2 small, medium, large, XL • Selection of hats • Neonatal cut-down set • Sterile hand towel

Appendix E

Resuscitaire Equipment for the Stand-alone Birthing Units

STAND ALONE MLBU:

Resuscitaire, plugged into the mains and containing:

•O2 & Air cylinders attached and at least half full
•Suction source with mini yanker sucker attached
•Tom thumb outlet with Tom thumb set and silicone mask attached; size 0 for premature baby, size 1 for term baby
•Oxygen outlet with funnel/silicon mask attached
•Towels x2
•Hat x2 different sizes
•Saturations Monitor
•Saturations Probe
•Neonatal Stethoscope
•Laryngoscope, single use
•Guedel Airways: one each of size 000 (pink), 00 (blue), 0 (grey) and 1 (white)
•Scissors
•Cord clamps x2
•Plastic bag for <30/40 gestation baby
•Neonatal thermometer
•BM machine
•Laminated Resuscitation Council Algorithm
•Neonatal BVM (in case of power/equipment failure)

COMMUNITY CAR:
•Towels x2
•Hat x2
•Neonatal Stethoscope
•Neonatal BVM
•Silicone masks size 0 & 1
•Laryngoscope, single use
•Guedel Airways: one each of size 000 (pink), 00 (blue), 0 (grey) and 1 (white)
•Laminated Resuscitation Council Algorithm