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# **Optimal Cord Management for All Newborns**

Guideline				
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Neonatal and Maternity				
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Children's Health CIG		15/6/2022		
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	Marie Glyn Doromal Advanced Neonatal N Women and Children	Marie Glyn Doromal  Advanced Neonatal Nurse Practitioner  Women and Children's division  Neonatal and Maternity  Date of Approval:  Last Review:		

Unique Identifier: MIDW/GL/220 | Status: Approved | Version No: 1

Guideline to be followed by (target staff): Neonatal and Maternity Staff

# To be read in conjunction with the following documents:

Thames Valley initial resuscitation & stabilization of the preterm infant (<32 weeks) guideline for neonatal units

Neonatal resuscitation MKUH guideline

Hypothermia prevention in the preterm <34-week neonate (plastic bag)

# Are there any eCARE implications? No

### **CQC** Fundamental standards:

Regulation 9 – person centered care

Regulation 10 – dignity and respect

Regulation 11 – Need for consent

Regulation 12 – Safe care and treatment

Regulation 13 – Safeguarding service users from abuse and improper treatment

Regulation 14 – Meeting nutritional and hydration needs

Regulation 15 – Premises and equipment

Regulation 16 – Receiving and acting on complaints

Regulation 17 - Good governance

Regulation 18 – Staffing

Regulation 19 – Fit and proper





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#### Disclaimer

Since every patient's history is different, and even the most exhaustive sources of information cannot cover every possible eventuality, you should be aware that all information is provided in this document on the basis that the healthcare professionals responsible for patient care will retain full and sole responsibility for decisions relating to patient care; the document is intended to supplement, not substitute for, the expertise and judgment of physicians, pharmacists or other healthcare professionals and should not be taken as an indication of suitability of a particular treatment for a particular individual.

The ultimate responsibility for the use of the guideline, dosage of drugs and correct following of instructions as well as the interpretation of the published material **lies solely with you** as the medical practitioner.

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### **Guideline Statement**

Most Infants and especially those born prematurely more frequently need support to achieve stabilization rather than resuscitation during fetal to neonatal transition.

This guideline aims to provide staff with the latest evidence based standard approach to the neonatal transition and stabilization of preterm infants born in MKUH to improve neonatal outcomes.

# **Executive Summary**

Previously, cutting the cord immediately after birth was widely practiced especially in preterm infants as part of the active management of the third stage of labour, together with prophylactic uterotonic drugs, controlled contraction to reduce post-partum haemorrhage (PPH), and enabling quick transfer of the preterm infant to neonatal care. However, current evidence advocates that delaying cord clamping for a minimum of 60 seconds is safe and can offer benefits to both term and preterm infants and is now recommended as standard practice.

The newborn's transition to extra-uterine life is a complex physiological process involving several different mechanisms that must happen simultaneously. In normal circumstances this includes: the newborn's spontaneous breathing which aerates the lungs and leads to a fall in pulmonary vascular resistance and subsequently results in increased pulmonary blood flow. This transition requires additional blood volume which is drawn from the low resistance placental circulation. The transition is also known as placental transfusion. Immediate cord clamping (ICC) interrupts this normal physiological process and can reduce venous return to the heart by 30-50%, consequently reducing cardiac output which can lead to circulatory collapse in the preterm infant. When cord clamping precedes aeration of the lungs this reduction in cardiac output could potentially result in reduced cerebral blood flow which explains the reports of associated intraventricular haemorrhage (IVH) in preterm babies with ICC.

Delaying cord clamping (DCC) has been shown to result in a 20-30% increase in blood volume. A Cochrane review in 2019 revealed that DCC in preterm infants can lead to improved circulatory stability, reduce need for inotropic support, less need for blood transfusion, reduced incidence of necrotising enterocolitis and a lower risk of IVH. More importantly, a recent meta-analysis including 18 trials reported a significant reduction in mortality by a third. Delayed cord clamping therefore is now recommended on all babies by the major resuscitation councils and health professional groups.

### Benefits of delayed cord clamping on term infants include:

- -higher birth weight
- -higher haemoglobin concentrations
- -increase iron reserves up to 6 months after birth
- -improved fine motor and social domain at 4 years of age

### **Risks of DCC in preterm infants:**

- Higher bilirubin levels.
- Increased risk of polycythemia in growth restricted neonates



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#### **Contraindications to DCC:**

- Requirement for immediate resuscitation (born pale, floppy with no or slow heart rate)
- Cord issues e.g no pulsation, cord snapping or incision
- Placental abruption or early separation.
- Uterine inversion
- Monochorionic twins (where risk of placental anastomoses may result in the draining of blood from twin 2 to twin 1 during DCC procedure).
- Maternal concerns e.g. PPH, shock, seizure. need for resuscitation

**Umbilical Cord milking (UCM)** has been proposed as an alternative to DCC. UCM is performed by stripping the blood from the umbilicus to the newborn 3-4 times usually within 20 seconds whereby placental transfusion is said to be achieved thereby reducing delay in resuscitation. Studies that compared UCM to Immediate cord Clamping (ICC) reported less Intraventricular hemorrhage (IVH), less chronic lung disease and higher hemoglobin levels. **However, <u>UCM is not recommended in babies <28 weeks.</u>** Studies showed a significant increased incidence of severe IVH in babies under 27 weeks gestation thus raising concerns of performing UCM in the very preterm.

There have been a few studies comparing DCC with stimulation to DCC with resuscitation (including positive pressure ventilation +/- CPAP via mask) which demonstrated that resuscitation with an intact cord is feasible. However, this did not reach statistical significance and yielded no significant difference in any neonatal or maternal outcomes. The practice of resuscitation with an intact cord is still controversial and further research is required before it can be implemented as a standard practice.

As with all aspects of the care we deliver, it is essential to provide clear **parental information**, with the opportunity for discussions and questions. This should take place during the antenatal period or early intrapartum period and should refer to the best practice recommendations. Upon consideration of the information provided, parents may **opt for early cord clamping**. This decision should be acknowledged and supported by clinical staff.

Administration of prophylactic uterotonic drugs i.e., oxytocin, should not be delayed as they have no proven impact on the efficacy of DCC and no observed increased risk of post-partum hemorrhage (PPH) or the need for manual removal of placenta following DCC.

### **Effects on Umbilical Cord Blood Banking**

Studies found that DCC significantly reduced the volume and total nucleated cell counts of cord blood donations. In cases in which a patient and the family are planning donation of umbilical cord blood, ICC may yield increase volume of cord blood obtained. However, in the absence of direct donation, the benefits of DDC at birth likely exceeds the benefits of banking that volume for possible future use.

#### **Definitions**

<u>Delayed Cord Clamping (DCC)</u> defined as the application of a clamp to the cord 30 seconds to 2 minutes after birth. Duration may be influenced by physiologic parameters in cases such as cessation of cord pulsation or breathing needs initiating.

<u>Immediate Cord clamping (ICC)-</u> The clamping of the cord soon after or <30 seconds from the birth of the baby

<u>Physiologic Based cord Clamping (PBCC)</u> timing of the cord clamping is based on the physiologic cues of cardio-pulmonary transition, aiming to allow sufficient time for the newborn to establish lung aeration, adequate pulmonary blood flow and pulmonary gas exchange prior to cord clamping



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<u>Umbilical Cord milking (UCM</u>): is where the umbilical cord is grasp and blood is pushed toward the baby prior to clamping

<u>Post-Partum Hemorrhage</u> (PPH)- is the most common obstetric hemorrhage; it is when a woman has heavy bleeding 500 ml or more after giving birth.

Intraventricular hemorrhage (IVH) bleeding inside or around the ventricles, the spaces in the brain containing the cerebral spinal fluid

Periventricular leukomalacia (PVL) is a softening of white brain tissue near the ventricles.

# 1.0 Roles and Responsibilities

### Ward Sister/ANNPs/Midwifery PDP's/Operational Manager/Matron Responsibilities

It is the Advanced Neonatal Nurse Practitioners (ANNPs) / Midwifery PDP's / Operational Managers / Matron's responsibility to ensure that all MDT (multidisciplinary team) staff caring for pregnant women and infants are made aware of the Trust Policy on optimal cord management, its procedures and processes.

Training from the Neonatal MDT must be available for all staff who may be involved in providing effective thermoregulatory care of a preterm infant. Staff competency should be monitored at their Personal development review (PDR).

To prompt discussions of delayed cord clamping for possible preterm delivery in addition to the preterm 6 check list during the huddle.

#### **Midwives**

To ensure that all equipment required for neonatal resuscitation and thermal support at birth is available and working correctly. This includes the Neonatal Resuscitation trolleys in Labour Ward and Phase 1 Theatres.

To ensure that equipment for thermal and respiratory support are appropriate for gestation and size.

To ensure that they are competent and confident to perform basic life support for the newborn and provide thermal care. Aim that all Band 7 level midwives on Labour ward must have completed the Resuscitation Council (UK) Neonatal Life Support -course.

To inform and call the neonatal team for any preterm delivery at a timely manner to allow maternal /parental antenatal counselling, for the neonatal team to attend the WHO checklist (if delivering in theatre), perform delivery equipment checks and allow neonatal unit preparation.

To provide information about optimal cord management at the time of antenatal counseling about the imminent preterm birth and obtain consent

#### **ANNP's/ Neonatal Medical staff**

To attend all preterm births and perform or lead resuscitation of the newborn when required.



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To attend preterm births/resuscitations in a timely fashion when called

To ensure all appropriate equipment required for neonatal resuscitation and optimal cord management are available ahead of time prior to delivery

To ensure they have a good working knowledge of the equipment provided for resuscitation and optimal cord management of the preterm.

To provide information about optimal cord management at the time of antenatal counseling about the imminent preterm birth and obtain consent.

To incorporate perinatal team discussion of optimal cord management during WHO or preop safety check list at caesarean section births.

Medical staff at registrar level or above who are responsible for the supervision and training of junior medical staff are aware of their role.

### The Obstetrics Medical staff

To provide information about optimal cord management at the time of antenatal counseling about the imminent preterm birth and obtain consent.

To ensure neonatal team notified of the imminent preterm birth

To ensure and communicate role allocation within the team during WHO checklist during CS deliveries

To aid with sterile preparation of equipment (if needed)

To monitor the cord pulsation and inform and coordinate with the neonatal team if delayed cord clamping is still appropriate or needed to be discontinued.

### The Obstetric theatre Nursing staff.

To prompt MDT considerations for optimal cord management

To aid with the sterile preparation of equipment

To provide a thermal environment conducive to preterm delivery (adjust theatre temperature if possible)

#### On call Consultant Paediatrician

The on-call Consultant should be alerted to attend all deliveries of preterm babies < 28 weeks gestation and any baby where a difficult resuscitation is anticipated as soon as possible.

To ensure they have an up-to-date good working knowledge of the process and equipment provided for optimal cord management resuscitation of the newborn.

To ensure junior medical staff and ANNP staff and neonatal nursing staff are made aware of the Trust Policy on optimal cord management, its procedures and processes.

### **Neonatal Nursing Staff**

To accompany medical staff/ANNPs attending births of babies less than 30 weeks gestation and any babies requiring resuscitation at birth.



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To ensure newborn life support training (NLS)is up to date and be aware or the processes of optimal cord clamping and providing thermal care

### **Neonatal Lead Paediatricians**

The Neonatal Lead Paediatricians are responsible for clinical care standards in relation to the stabilization of the preterm newborn.

# 2.0 Implementation and dissemination of document

This document will be disseminated across the Maternity Unit and Paediatric Department including the Neonatal Unit, through team meetings, and email circulation to all colleagues. The document can be located via the Hospital intranet- trust documentation.

# 3.0 Processes and procedures

### 3.1 Preparation for Delivery:

The neonatal team (Specialist Registrar (SpR), ANNP/SHO, neonatal nurse +/- consultant neonatologist) should be informed and called to attend preterm deliveries in a timely manner.

Discuss with the obstetric/midwifery team about the options of DCC or UCM prior to delivery and allocate and introduce who is going to manage the baby whilst the cord is still attached.

Ensure resuscitation equipment is available and in working order.

#### Normal vaginal deliveries

- \*For ≤30 weeks gestation deliveries the neonatal team consist of SpR, ANNP or SHO and QIS and NLS trained neonatal nurse.
- The obstetrician or midwife delivering the baby will monitor pulsation of the cord and report to neonatal team reduction to <60bpm or cessation of pulsation</li>

### For cesarean births

- The neonatal team should be called in time to attend the WHO checklist.
- -All preterm >30-34 weeks gestation, the neonatal team consist of SpR, ANNP or SHO.
- For < 30 weeks gestation deliveries the neonatal team consist of the SpR, the ANNP or SHO and a QIS and NLS trained neonatal nurse.
- For <28 weeks gestation deliveries, whenever possible, the Consultant Neonatologist / on-call Paediatric Consultant should also be in attendance.
- For preterm <32 weeks gestation:</p>
  - the SpR/ senior ANNP will be gowned up and will stand by the operating table
  - The SpR/Senior ANNP will put the preterm in the plastic bag and assess and decide the suitability of the OCM.
- For preterm ≥34 weeks gestation:
  - The obstetric surgeon or the assisting surgeon may assess, stimulate and dry the baby and monitor the cord pulsation
  - The midwife may be gowned and will stand by the operating table to dry and stimulate the baby and bring baby to the resuscitaire once cord is clamped and cut.



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- The obstetric surgeon will monitor pulsation of the cord and report reduction to <60bpm or cessation of pulsation</li>
- The neonatal nurse or midwife or SHO will start the APGAR clock from time of birth and inform the team that 1 minute has been reached.

Aim for all infants to receive DCC for a minimum of 60 seconds. PBCC if possible if baby is stable. Only stable neonates should be DCC >60 seconds.

Consider UCM for >28 weeks of age if born poor or suboptimal condition. <u>UCM < 28 weeks is currently not recommended</u> since studies have demonstrated a significant increase incidence of severe IVH in preterm infants. UMC should only be used if there is an urgent need to commence resuscitation for mother or infant which precludes the delay of at least 60 seconds to allow placental transfusion.

#### Do not resuscitate while DCC.

### 3.2 Delivery of newborn baby

Communicate the allocated member of staff who will lead the timing of DCC usually the neonatal team if present or the midwife.

The members of the neonatal team will be:

- present at the obstetric field ready to receive the newborn baby and the assistance of the midwife place the baby in the bag or
- In case of C-section, the midwife (for >32 weeks gestation newborns) or neonatal SpR/ ANNP (for <32 weeks gestation newborns), will be gowned up and stand by the operating table and jointly with the surgical scrub nurse, will place the newborn in the sterile plastic bag.
- Babies < 32 weeks gestation could be placed on pre-activated transwarmer mattress whilst awaiting cord clamping.
- The second neonatal team member or midwife will start the clock on the resuscitaire once the baby's whole body is born and inform the team once the 60 seconds is reached. Most resuscitaires alarm at 1 minute which will indicate when to clamp the cord.
- The neonatal SpR/ANNP (<32 weeks gestation) or the midwife (>32 weeks gestation) will visually assess stability for DCC i.e. colour and tone.
- The Obstetrician or midwife delivering the baby will monitor pulsation of cord and report to the neonatal team reduction to <60bpm or cessation of pulsation.</li>
- Whilst waiting for end of DCC, apply oxygen saturation probe to right wrist and hat to baby's head.

### Only stable preterm infants should undergo DCC for 60 seconds.

The obstetric surgeon, in case of Caesarean section, or the delivering Midwife/ obstetric registrar, or if normal vaginal delivery, will monitor pulsation of the cord and report reduction or cessation of pulsation.

If the patient is pale and floppy/ there is no cord pulsation, the cord should be clamped and cut without delay and the baby be brought on to resuscitaire for commencement of resuscitation. Delayed cord clamping can be safely done in Caesarean section under general anaesthesia and the advantages from DCC outweigh the small risks to the fetus from maternal anaesthetic gases.





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Thermal management of the newborn during DCC.

- Avoid drafts and air conditioning or turn of fans.
- o Dry the
- Pre-warm the resuscitaire ensuring the heater is on 100%

for preterm < 34 weeks gestation, as above and the following:

- o prewarm the polyethylene plastic bag pack before opening
- Activate the trans-warmer mattress a few minutes before delivery.
- o Do not dry the baby, place in polyethylene plastic bag/ plastic bag +hat
- o Ensure regular measurements of temperature throughout stabilisation. If temperature > 37.0 degrees centigrade, remove trans-warmer mattress.

Positioning of the baby will depend on the mode of delivery and condition at birth:

Vaginal delivery: the baby should be held at the level or slightly above the placenta or below the perineum if short cord or no more than 20cm above the introitus or can be on the abdominal wall too.

Caesarean Section Delivery: The baby should be held below the level of the incision site or on abdominal wall and ultimately no more than 10cms above the uterus. Avoid lifting the baby high to show mum.

The obstetrician/ midwife will cut the cord or perform UCM if ICC is indicated The neonatal SpR/ ANNP with bring the baby to the resuscitaire.

Reassess and stabilize the preterm newborn for transfer to neonatal unit.

Aim to keep the baby's temperature 36.5-37.5C, using radiant heat and or transwarmer mattress, and cover infant with towels just before disconnecting the resuscitaire from the power supply. Ensure baby is properly labeled prior to transfer.

Update parents as to condition and management plan.

## 3.3 Documentation

The execution of DCC should always be recorded in the notes by the people involved in the delivery. Documentation should include the duration of DCC and the reason for ICC. It will be useful information for the following:

- if the preterm baby develops jaundice requiring phototherapy
- o audit purposes in monitoring morbidities i.e. anemia, IVH, NEC
- audits for Quality improvement project



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# Quick reference flow Chart

### Decision for delayed cord clamping?

#### Are any of the following contra-indications present? -Clamp cord immediately Requirement for resuscitation ie pale and floppy -Consider UCM Cord issues e.g. no pulsation, cord snapping or for > 28 weeks incision, limited cord length YES -Proceed to Placental abruption or early separation. standard NLS Uterine inversion algorithm on the Maternal concerns e.g. PPH and shock seizures etc. resuscitaire NO

Mode of delivery

### Vaginal delivery

- \*Start the clock on resuscitaire
- \*Use appropriate thermal care appropriate for gestation e.g. polyethylene plastic bag, hat, thermal mattress for <32 weeks
- \* Stimulate the baby to breath, open airway: head in neutral position to initiate PBCC
- \*Hold baby below perineum or no more than 20cms above the introitus.
- \*Observe cord for pulsation and continue to monitor the baby's condition.
- \*Delay clamping for **1 minute** unless cord pulsation ceases, or immediate resuscitation is required for baby or mother.
- \*Attach saturation probe to the right wrist but only attach to monitor when the baby is on the resuscitaire

### **Caesarean section delivery**

- \*Start the clock on resucitaire
- \*Use appropriate thermal care of gestation e.g. neohelp plastic bag
- \*Stimulate the baby to breath, open airway: head in neutral position to initiate PBCC
- \*Hold the baby below the level of incision site or ensure baby is no more than 10cm above the uterus.
- \*Observe cord for pulsation and continue to monitor the baby's condition
- \* Delay clamping for **1 minute** unless cord pulsation ceases, or immediate resuscitation is required for baby or mother.

\*Transfer to resuscitaire for reassessment e.g. airway, breathing, circulation, temperature, etc

\*Ensure identification label in situ transfer to Neonatal unit if appropriate



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### 4.0 Statement of evidence/references

There is strong evidence that demonstrates DCC is beneficial and therefore performing delayed cord clamping for 60 seconds is recommended in all eligible infants.

#### CURRENT BEST PRACTICE RECOMMENDATIONS

The Cochrane Collaboration. "A more liberal approach to delaying clamping of the umbilical cord in healthy term infants appears to be warranted, particularly in light of growing evidence that DCC increases early haemoglobin concentrations and iron stores in infants. DCC is likely to be beneficial as long as access to treatment for jaundice requiring phototherapy is available"

National Institute for Clinical Excellence (NICE). "Do not clamp the cord earlier than 1 minute from the birth of the baby unless there is concern about the integrity of the cord or the baby has a heartbeat below 60 beats/minute that is not getting faster"

Royal College of Obstetrics and Gynaecology (RCOG). "In healthy term babies, the evidence supports deferring clamping of the umbilical cord, as this appears to improve iron stores in infancy. Jaundice may be more common after deferred cord clamping but this management is likely to be beneficial as long as phototherapy for jaundice is available. This assessment of the evidence is concordant with the Cochrane review and the recommendations by NICE"

British Association of Perinatal Medicine (BAPM) "Optimal cord clamping reduces death by nearly a third. The number of babies that need to receive OCM is around 30-50 overall and may be as low as 20 in the least mature infants. OCM also increases BP and reduces need for inotropes and need for blood transfusion."

UK resuscitation council 2021. Where immediate resuscitation or stabilisation is not required, aim to delay clamping the cord for at least 60 seconds. A longer period may be more beneficial, and clamping should ideally take place after the lungs are aerated.

WHO states late cord clamping (performed after 1-3 minutes after birth) is recommended for all births while initiating simultaneous essential newborn care Early cord clamping (< 1 minute after birth) is not recommended unless the infant is asphyxiated and needs to be removed immediately for resuscitation.

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Available from: 9789290616856\_eng.pdf (who.int)

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### External weblink references:

Please note that although Milton Keynes University Hospital NHS Foundation Trust may include links to external websites, the Trust is not responsible for the accuracy or content therein.'

Optimal Cord Clamping | Blood to Baby | England

NNAP Online (rcpch.ac.uk)

PERIPrem Bundle: Delayed cord clamping | West of England AHSN (weahsn.net)

Unique Identifier: MIDW/GL/220 Version: 1 Review date: Jun 2025

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# 6.0 Governance

6.1 Document review history

Version number	Review date	Reviewed by	Changes made
1	2021	Marie Doromal	New document

6.2 Consultation History

Stakeholders Name/Board	Area of Expertise	Date Sent	Date Received	Comments	Endorsed Yes/No
Zuzanna Gawlowski	Consultant Paediatrician	09/12/2021	09/12/2021	Reviewed and provided feedback.	Yes.
James Bursell	Consultant Paediatrician	16/12/2021	16/12/2021	Reviewed and provided feedback.	Yes.
Sanyal Patel	Consultant Obstetrician	11/01/2022	11/01/2022	Suggested change of title to Delayed Cord Clamping.	No.
Janice Styles	Maternity	13/01/2022	13/01/2022	Reviewed and left feedback.	Yes.
Lauren Mitchell	Maternity	12/2/2022	17/02/2022	Reviewed and left feedback.	Yes
Swati Velankar	Consultant obstetrician	19/19/2021	30/03/2022	Reviewed and commented and added	Yes
Maternity Guideline review	Maternity- Obstetrics	30/03/2022	30/03/2022	Reviewed and presentation was held, then approved	Yes
Jacqueline Mbabazi	Paediatric Doctor	11/02/2022	11/02/2022	Reviewed all comments with Glyn and amended guideline as necessary.	N/A
Children's Health CIG	Governance	09/05/2022	09/05/2022	Approved	Yes

6.3 Audit and monitoring

Audit/Monitoring Criteria	Tool	Audit Lead	Frequency of Audit	Responsible Committee/Board



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### **6.4 Equality Impact Assessment**

As part of its development, this Guideline and its impact on equality has been reviewed. The purpose of the assessment is to minimise and if possible remove any disproportionate impact on the grounds of race, gender, disability, age, sexual orientation, religion or belief, pregnancy and maternity, gender reassignment or marriage and civil partnership. No detriment was identified. Equality Impact assessments will show any future actions required to overcome any identified barriers or discriminatory practice.

Equality Impact Assessment								
Division		Women and Children's				Department		Neonatal
Person completing the	EqIA	Marie Glyn Doromal				Contact No.		Ext.87164
Others involved:						Date of assess	sment:	06 2021
Existing policy/service						New policy/ser	rvice	
Will patients, carers, the	•		١	10				
be affected by the police of the staff, how many/which	-							
affected?	i group	2 MIII DE						
Protected characteristic	;	An	y imp	act?	Comme	nts		
Age			l	OV	Positive	impact as the p	olicy ai	ms to
Disability				NO		e diversity, promote inclusion an		
Gender reassignment			NO fair t		fair treat	ir treatment for patients and staff		
Marriage and civil par	tnership	р	NO					
Pregnancy and mater	nity		l	NO				
Race				NO				
Religion or belief			NO					
Sex			NO					
Sexual orientation			NO					
What consultation meth	. ,			ed out?				
focus groups, face-to-fa								
How are the changes/a				olicies/servi	ces comn	nunicated?		
Mostly, email, meetings								
What future actions need to be taken to overcome any barriers or discrimination?								
What?		rill lead this? Date of comp		•				
Regular reviews			nd finishing			Quality		
Review date of EqIA	group 1 06/202				audits/ ı	reviews		
Treview date of Eqr. 00/2024								