

Guideline for Management of Umbilical Cord Clamping

1. Introduction and Who Guideline applies to

This guideline is aimed at all Health care professionals involved in the care of infants within Maternity and Neonatal Services.

Aim

This guideline provides an outline of deferred cord clamping (DCC) / management at birth.

Related documents:

- [Thermal Protection of the Newborn UHL Obstetric and Neonatal Guideline \(C166/2016\)](#)
- [Resuscitation at Birth UHL Neonatal Guideline \(B35/2008\)](#)
- [Intrapartum Care UHL Obstetric Guideline \(C60/2019\)](#)
- [Meconium Stained Liquor at Delivery UHL Neonatal Guideline \(C103/2008\)](#)
- [HIV Screening and Management in Pregnancy UHL Obstetric Guideline \(C63/2004\)](#)

Key Points

1	Current RCUK recommendation where possible, is for DCC for at least 60 seconds after birth in preterm and term babies
2	DCC improves survival in preterm infants
3	Maintaining normothermia with gestational appropriate thermal care is crucial when conducting DCC (<i>Note: placental blood is also warm</i>).
4	DCC avoids the induced bradycardia caused by immediate cord clamping
5	DCC improves haematological indices

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Inclusion criteria

- All gestations

Exclusion Criteria*

- **Need for immediate resuscitation** (Unless DCC can be achieved alongside stabilisation/resuscitation)
- DCC not felt to be safe by neonatal or maternity team
- Cord issues e.g. cord snapping or prolapse.
- Placental abruption or early separation.
- Uterine inversion.
- Monochorionic twins
- Maternal concern e.g. Postpartum haemorrhage (PPH), shock, seizure etc
- Known severe fetal hypervolemia, e.g. hydrops fetalis
- Maternal HIV-positive status with high viral load

Key benefits of DCC

See summary of evidence section in [Appendix 1](#) for more details.

Preterm (adapted from the meta-analysis by Seidler et al ⁽¹³⁾)

- Improves survival in preterm infants ^(2,5,13)
- Avoids the induced bradycardia caused by immediate cord clamping (ICC) and associated abrupt cardiovascular changes
- Result in a 20-30% increase in circulating blood volume which: ^(2,5,13)
 - Reduces blood transfusion (↓ in 'any transfusion' and ↓ in 'total number of transfusions')
 - Higher haemoglobin & haematocrit at 24 hours
 - Higher haematocrit at 7 days
- Improved cardiovascular stability in first 24 hours including: ^(5,13)
 - Reduced receipt of inotropes
 - Higher mean blood pressure in first 24 hours
- Fewer intraventricular haemorrhages (all grades) ⁽⁵⁾.
- One study suggested DCC may reduce risk of adverse neurodevelopmental outcome in preterm babies at 2 years of age ⁽⁶⁾.

Term (adapted from the meta-analysis by Gomersall et al ⁽¹⁴⁾)

- Lower incidence of iron deficiency in term infants ^(12, 14)
- DCC avoids the induced bradycardia caused by ICC and associated abrupt cardiovascular changes
- Higher haemoglobin in the first 24 hours
- Improved iron stores in infancy

Potential harms (5,12)

- Higher peak bilirubin but no increase in receipt of phototherapy in preterm babies
- Slight increase in receipt of phototherapy for neonatal jaundice in term babies

Background

Deferred cord clamping (DCC) allows placental transfusion where blood passes from the placenta to the newborn baby.

DCC has no fixed time definition, but studies have considered clamping the cord at more than 30 seconds. An alternate approach is to clamp the cord after the lungs have been aerated (1,7)

DCC is recommended by multiple national and international groups (RCUK, ERC, ILCOR, WHO, BAPM, RCOG (3,4,15)). The RCUK NLS recommends DCC for at least 60 seconds after birth, for all gestations, unless it is contraindicated. Achieving this as part of newborn care requires planning and should feature in the pre-delivery team brief.

Evidence of the efficacy of DCC in a baby that requires resuscitation is unclear and resuscitation remains the priority although in some cases resuscitation has been provided at mother's side with the umbilical cord intact. Umbilical cord milking has been considered where there is insufficient time for DCC, however it is not recommended in this guideline.

Practicalities of providing DCC

Most babies should receive DCC and there are relatively few exclusion criteria. Initial thermal care and assessment should follow current practice and where necessary NLS guidelines.

The only difference is the initial drying, stimulation and assessment of colour tone, heart rate and breathing should be done with the cord intact. This is likely to take approximately 30 seconds and will indicate if immediate resuscitation is required. As long as immediate resuscitation is not required it is reasonable to wait another 30 seconds before clamping the cord.

It is worth remembering that the baby is receiving warm, oxygenated blood through the cord during this time and some well babies can take ~60 seconds to establish regular breathing.

Duties and responsibilities

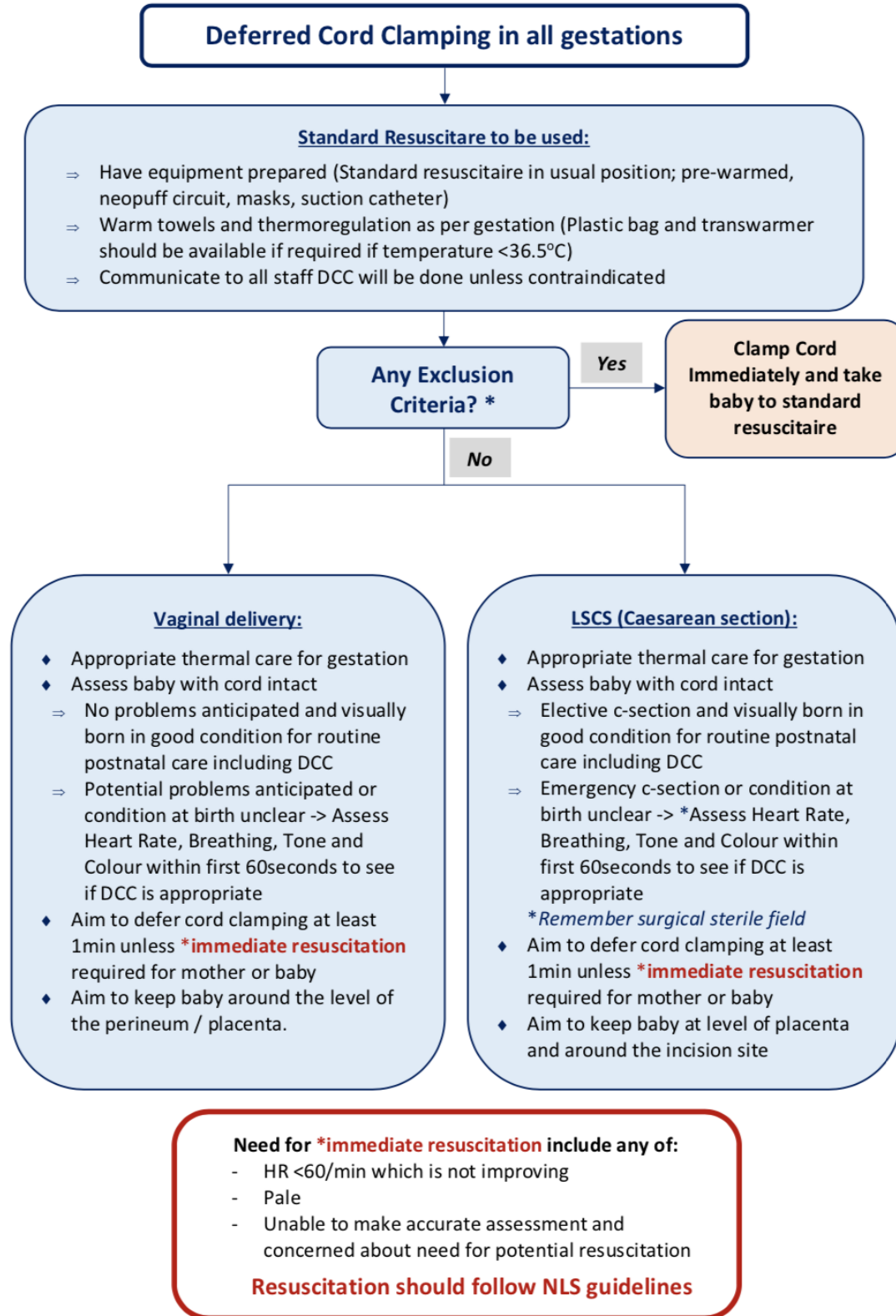
- All multidisciplinary staff involved in the delivery of term and preterm babies should assist in facilitating the practice of delayed cord clamping.
- If possible, parents should be made aware prior to delivery that delayed cord clamping will take place.

Responsibility of neonatal team if present at delivery

- A member of the neonatal team should be available to assess the baby with the cord intact to support DCC.
- For babies born at less than 30-week gestation a senior neonatal team member should undertake assessment of the baby to support DCC.
- For babies born by caesarean section, discuss with the obstetric team whether a neonatal team member is needed to assess the baby with the cord intact to support DCC (i.e. preterm birth or suspected fetal compromise).

- Sterile field needs to be maintained in theatre.
- If assessing baby in theatre the Neonatal team member should wear surgical gown, hat and sterile gloves.
- For assessment of heart rate in theatre, ensure stethoscope is in sterile covering.
- Document if DCC was performed and time duration of DCC in baby notes or BadgerNet. Please ensure all eligible infants have DCC for a minimum of 1 minute, and if this cannot be achieved, please record time of cord clamping and reason in notes.
- Temperature check prior to leaving labour ward if baby is being admitted to the neonatal unit. If hypothermic, take active measures to achieve normothermia.

UHL Deferred Cord Clamping (DCC) Algorithm



APPENDIX 1: Summary of Evidence for DCC

DCC has been shown to facilitate the normal physiological process which occurs during transition from intra-uterine life. If the cord is clamped immediately there is a drop in the heart rate which recovers with time and if the cord is clamped after the lungs are aerated this bradycardia does not occur.

When a baby takes their first breaths, the lungs are aerated leading to a fall in pulmonary vascular resistance and increased blood flow to the lungs, supplying most of the preload to the left ventricle. DCC facilitates this process by providing extra blood volume from the low resistance placental circuit, significantly increasing venous return to the heart, and therefore cardiac output. This process is particularly beneficial to the preterm baby who is at an increased risk of circulatory collapse and is vulnerable to fluctuations in cerebral blood flow which have been shown to occur when the cord is clamped immediately, prior to aeration of the lungs. The mechanism of action relates to a fall in ventricular preload, with a resultant reduction in left ventricular output and a drop in carotid artery and cerebral perfusion.

The following graph (*fig. 1*) depicts how DCC promotes increased physiological stability in the first five minutes after birth compared to immediate cord clamping (ICC) ^(10,11):

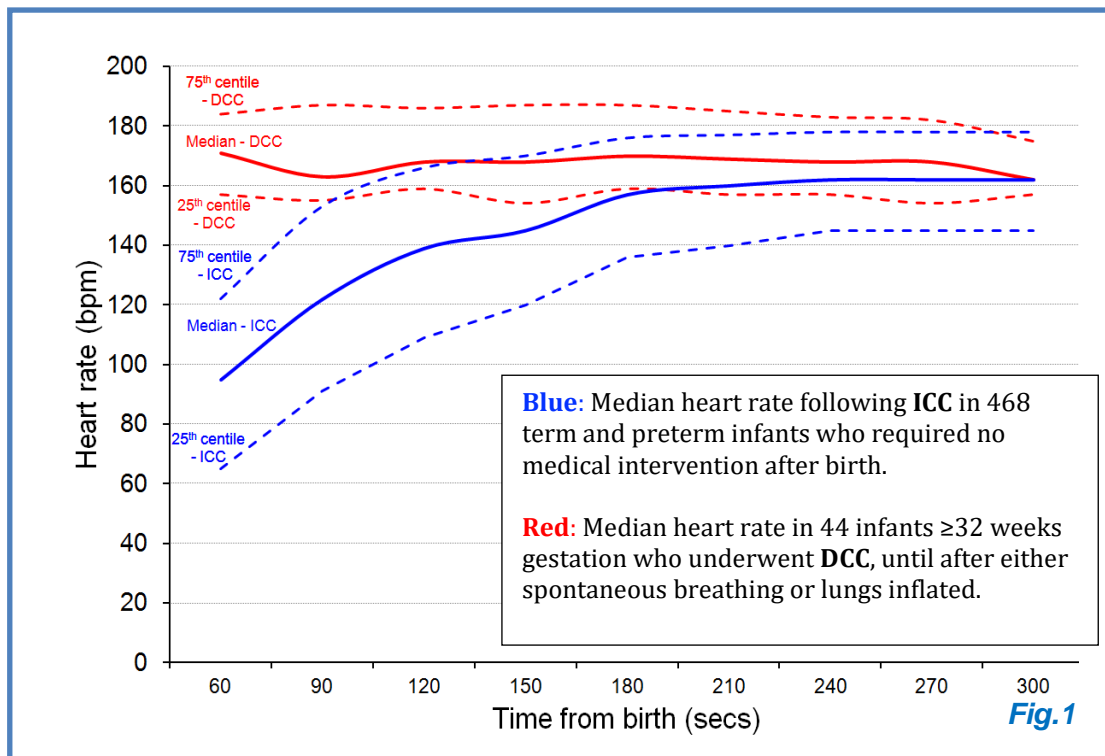


Table 1 benefits and risks of DCC:

	<i>Preterm Infants</i>	<i>Term Infants</i>
Benefits	<p><u>Possible reduction in mortality:</u> Fogarty et al⁽²⁾: RR 0.68 (95% CI 0.52-0.90), NNT 33. Sub-group analysis Infants <28wk, RR 0.70 (95% CI 0.51-0.95) NNT 20.</p> <p>Seidler et al⁽¹³⁾: (16 studies, 2988 infants) RR of 0.80 (95% CI: 0.63 to 1.02). Demonstrated possible reduction in preterm infant mortality.</p>	<p><u>Higher birth weight:</u> Cochrane⁽¹²⁾: (12 trials, 3139 infants), 101g increase in mean birth weight, MD 101g, (95%CI 45-157).</p> <p><u>Higher haemoglobin concentration:</u> Cochrane⁽¹²⁾: (Four trials, 884 infants). 24-48hours of life MD -1.49g/dL (95% CI - 1.78 to -1.21).</p>
	<p><u>Reduced need for inotropic support:</u> Cochrane⁽⁵⁾: RR 0.42 (95% CI 0.23-0.77).</p> <p>Seidler et al⁽¹³⁾: First 24 hours of life RR 0.36, (95% CI 0.17-0.75). Higher value of lowest mean arterial blood pressure in the first 12 hours of life, MD: 1.79 mmHg, (95%CI 0.53-3.05).</p>	<p>Gomersall et al⁽¹⁴⁾: Higher Hb at 24hrs, MD 1.17g/dL, (95% CI 0.48-1.86).</p>
	<p><u>Reduction in blood transfusion:</u> Cochrane⁽⁵⁾: (7 trials, 392 infants) RR 0.61, (95%CI 0.46–0.81).</p> <p>Fogarty et al⁽²⁾: Reduction by 10% (95% CI 6-13%).</p> <p>Seidler et al⁽¹³⁾: RR 0.83 (95% CI 0.77-0.90). Lower total number of blood transfusions per infant, MD: -0.63, 95% CI: - 1.08 to -0.17).</p>	<p><u>Lower incidence of iron deficiency:</u> Cochrane⁽¹²⁾: (Five trials, 1152 infants) Three-six months, RR 2.65, (95% CI 1.04 – 6.73).</p> <p>Gomersall et al⁽¹⁴⁾: <i>No difference in anaemia at 4-6months.</i></p>
	<p><u>Increased Peak Haematocrit:</u> Fogarty et al⁽²⁾: 2.73% (95% CI 1.94 – 3.52).</p> <p>Seidler et al⁽¹³⁾: MD: 2.63%, (95% CI: 1.85 to 3.42).</p>	
	<p><u>Fewer intraventricular haemorrhages:</u> Cochrane⁽⁵⁾: (10 trials, 539 infants) All grade RR 0.59 (95% CI 0.41-0.85). <i>Note: No difference with severe IVH^(2,5,13).</i></p> <p>May reduce risk of adverse neurodevelopmental outcome in preterm babies at 2 years of age. ^{(6)*}</p>	
Risks	<p><u>Higher peak bilirubin level:</u> Fogarty et al⁽²⁾: (7 trials, 320 infants) MD 15mmol/L (95% CI 5.62-24.40).</p> <p>Seidler et al⁽¹³⁾: (Six RCTs, 908 infants) little or no difference for hyperbilirubinemia treated by phototherapy. RR 0.99, (95% CI 0.95 to 1.03).</p>	
<p>* Adverse neurodevelopmental outcome: Criteria for a moderate/severe impairment met in any one of five functions: motor, cognitive, speech/ language, hearing or vision. <i>For motor, this was defined as a Bayley-III gross motor scale score <7. For cognitive and speech/language functions, this was defined as having a composite score <85.</i></p>		

Education and Training

None

Audit standards

All babies (Term and preterm) who do not meet the exclusion criteria should receive at least 60 seconds of deferred cord clamping (100%).

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Key Words

Immediate cord clamping, Placental transfusion, Umbilical

The Trust recognises the diversity of the local community it serves. Our aim therefore is to provide a safe environment free from discrimination and treat all individuals fairly with dignity and appropriately according to their needs. As part of its development, this policy and its impact on equality have been reviewed and no detriment was identified.

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Details of Changes made during review:			
Date	Issue Number	Reviewed By	Description Of Changes (If Any)
	1		UHL involved in CORD Pilot Trial
			DCC audit
May 2021			DCC Evidence presented to Neonatal Service
May 2021			DCC guideline written
November 2021			DCC guideline ratified by Neonatal Service
December 2021			DCC guideline ratified by Maternity Service