AIMS For a better birth...

Neonatal resuscitation

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David Hutchon and Amanda Burleigh look at breathing support and optimal clamping

Have you ever thought that your baby may require resuscitation? Perhaps you have tried to avoid such thoughts, knowing the distress which might be felt by you and your partner, when, just at the moment your baby is born, it has to be moved over to the resuscitaire to help it start breathing. The distress is only slightly reduced by the thought that everything is being done to help your baby change from breathing through the placenta to breathing in air.

Usually the resuscitation is carried out at the opposite corner of the room and surrounded by doctors, so you may not even know that your baby is recovering. When your baby does begin to cry, the sound of its cry will never be sweeter. Fortunately this is the usual outcome and many babies taken over to the resuscitaire need nothing more than support to stay warm and start breathing on their own.

So is it always really necessary to take the baby away from its mother? 'Better safe than sorry' is the usual motto. By taking the baby over to the resuscitaire 'just in case', any delay in accessing equipment is avoided. This has been the tradition and rationale in hospital births for the last 50 years but things are changing. The umbilical cord is only about 30cm and third stage guidelines used to dictate early clamping and cutting of the cord, readily allowing the baby to be moved away from its mother, but guidelines to prevent bleeding after the baby is born now recommend delayed cord clamping.[1, 2]

Increasing numbers of parents are becoming aware of the importance of delaying clamping, and the evidence shows that the baby benefits from avoiding premature clamping and cutting of the umbilical cord. Parents are entitled, in their birth plan, to ask for delayed clamping which follows the International Liaison Committee on Resuscitation (ILCOR) produced in 2010 and drawn up for the benefit of the baby.[3] Despite an increased demand for delaying cord clamping, due to the perceived need for resuscitation, in 17% of all hospital births parents are being denied their request and told delayed clamping is impossible if the baby requires any form of resuscitation.

In an audit last year at a large teaching hospital, 75% of all babies had the cord cut within one minute of birth. An audit of women who had requested delayed cord clamping showed that only 8% got their wishes regardless of their baby needing resuscitation or not. As the baby is delivered the intervention of cord clamping is likely to be low down in the parents' thoughts and once the cord is clamped it is irreversible. Reinforcing the request for delayed cord clamping during labour and during the second stage may help the midwife or doctor keep the request in their mind.

The Day-by-Day Pregnancy Book by Dr Maggie Blott explains that the umbilical cord will normally be clamped two to three minutes after birth, explaining that evidence shows that this boosts the baby's oxygen and blood volume. Professor Lesley Regan, in her book *Your Pregnancy Week by Week*, explains how the baby changes from placental respiration to lung respiration at birth involving the circulatory changes in the heart and ending with closure of the placental circulation. *What to Expect When You're Expecting* by Heidi Murkoff also describes the few minutes that are allowed before the cord is clamped and cut. The expectation therefore, for those women who read these popular books, is that delayed cord clamping is just normal practice.

Mums are often upset by this unwanted and unhelpful intervention:

'I would be quite upset if my newborn baby was denied delayed cord clamping. However, if it was denied due to emergency reasons I would try and understand, but any other reason would make me feel frustrated. As I am so aware of delayed clamping now, I feel that it should be common practice. It carries so many benefits to children and I did not think it posed any risks whatsoever.' **Tatjana Grozenoka May 2011**

'I was considering delayed cord clamping because of the health benefits it has for the newborn baby. It was not able to be given due to the quick delivery of my child. I didn't meet any resistance as I did not have time for a discussion about it. If there was a mini resuscitaire available it would put my mind at ease in case of problems, I think it would be a fantastic idea to have one available. I think the demand for delayed cord clamping will increase with more public knowledge of the benefits. If they said no I would have wanted to know the reasons why and would have been angry as it is my choice as a mother.' **Zoe Ambrose May 2011**

'The reason I wanted delayed cord clamping was because I had researched it myself and had read about all the positive effects it would have on my baby. In my mind there was no reason for the midwives at my labour to cut the cord immediately so that's why we had chosen to have delayed cord clamping. If there was a mini resuscitaire trolley with oxygen and suction available during my delivery I think the midwives would have delayed cord clamping without endangering my baby. But since there wasn't one there, they did not delay cord clamping. I definitely think if they had a bedside resuscitaire in the delivery rooms in the future the midwives would not rush to cut the cord even if there is a slight complication. I must say I was disappointed when they did not do it because the midwives' priorities were to get my baby out and when they did he was safe and healthy and so was I. So I didn't understand why they had to cut the cord in such a rush. Sadly I did not ask anyone why.' **Ambia Begum May 2011**

Resuscitation without dividing the umbilical cord

David Hutchon spent a year working in a remote area of New Zealand where it was not unusual for the midwives to be single handed. If the baby failed to start breathing, the midwife was already prepared. With the newborn baby lying on the bed by its mother's legs, tubing with suction and oxygen had already been led from the wall mounted resuscitaire to the delivery bed and was ready to be used to initiate resuscitation. The midwife did not need to leave the mother and was able to watch for any worrying bleeding. The baby was wrapped in a warm towel and kept close to its mum (with dad usually also by the side of the delivery table) and the umbilical cord left intact so that for several minutes the baby benefited from the oxygen from the placenta. Just as in hospital births in New Zealand, there was rarely any need for anything to be done other than stabilisation and warmth. An important difference, however, was that the mother and baby were never separated.

It has been traditional for hundreds, indeed thousands, of years to separate the baby from the placenta at some stage rather than carry the baby around with the placenta for several days. However, the time that the baby has been left with the placenta attached by the cord has steadily decreased, particularly with the advent of oxytocic drugs approximately 50 years ago, so that nowadays early cord clamping and cutting (within 20 seconds of birth) is common, especially in hospital births.

By depriving the baby of its additional oxygen, this may make the need for resuscitation more likely. This was recognised in 1954 when Geoffrey Dawes showed the evidence from his work in lambs:*'We learnt that if the cord is ligated before respirations begin, profound asphyxia results.'*[4] If there is a large loss of blood these babies will be in poor condition and need resuscitation and sometimes blood or fluid transfusion. Loss of a large placental transfusion typically occurs when there has been fetal distress due to cord compression. Allowing the baby to receive the placental transfusion is just as important as getting resuscitation initiated. However, both are possible at the same time as explained above.

Resuscitation with the baby between the legs of the mother is a well-recognised way of ensuring the baby gets an adequate placental transfusion and is not hypovolaemic (short of blood). An alternative approach, and one which is more acceptable to many practising in a high-tech setting, uses the new LifeStart trolley. It is less expensive than a traditional resuscitation trolley, is fully mobile and allows resuscitation with the cord intact in all sorts of births. The resuscitation equipment means that the neonatologist is not compromised by any lack of equipment and the baby is not compromised by the loss of oxygen or placental transfusion.

The trolley and the project to encourage bedside resuscitation to be made available to all babies, facilitating optimal cord clamping even for those babies who are or may be compromised, is called BASICS (Bedside Assessment Stabilisation Immediate Cardiorespiratory Support).

This trolley also enables parents to have their baby close and visible to them, and for their baby to benefit from the continued nurturing care that the placenta has bestowed on their baby for the duration of the pregnancy without any real or perceived technical issues for attending medical staff.

Clinical evaluation of the equipment is underway. This equipment is available to be ordered by your

maternity unit now, so there is no reason why bedside resuscitation facilities cannot be provided to ever y mother and baby, and why physiological cord clamping, with all its advantages, cannot be offered to all babies, but particularly to those who are already compromised or vulnerable who would stand to benefit most from continued placental oxygenation.

If you are on your local MSLC, Labour Ward Forum or other maternity care strategic or campaign group then this may be a great way of helping clinicians and mothers reach a solution so that mums and babies are not separated and clinicians have all the equipment they are familiar with using.

Clinical trials using the trolley are also underway in helping very pre-term babies transfer from placental to lung breathing, and for these babies the likelihood is that delayed clamping will be very beneficial.

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