

# Delayed Cord Clamping: The Obstetric and Midwifery perspective

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# The life story of 'the cord'



### Vascular system

Intraembryonic

Vitelline

Placental

Heart

Sinus  
venosus

Yolk  
sac

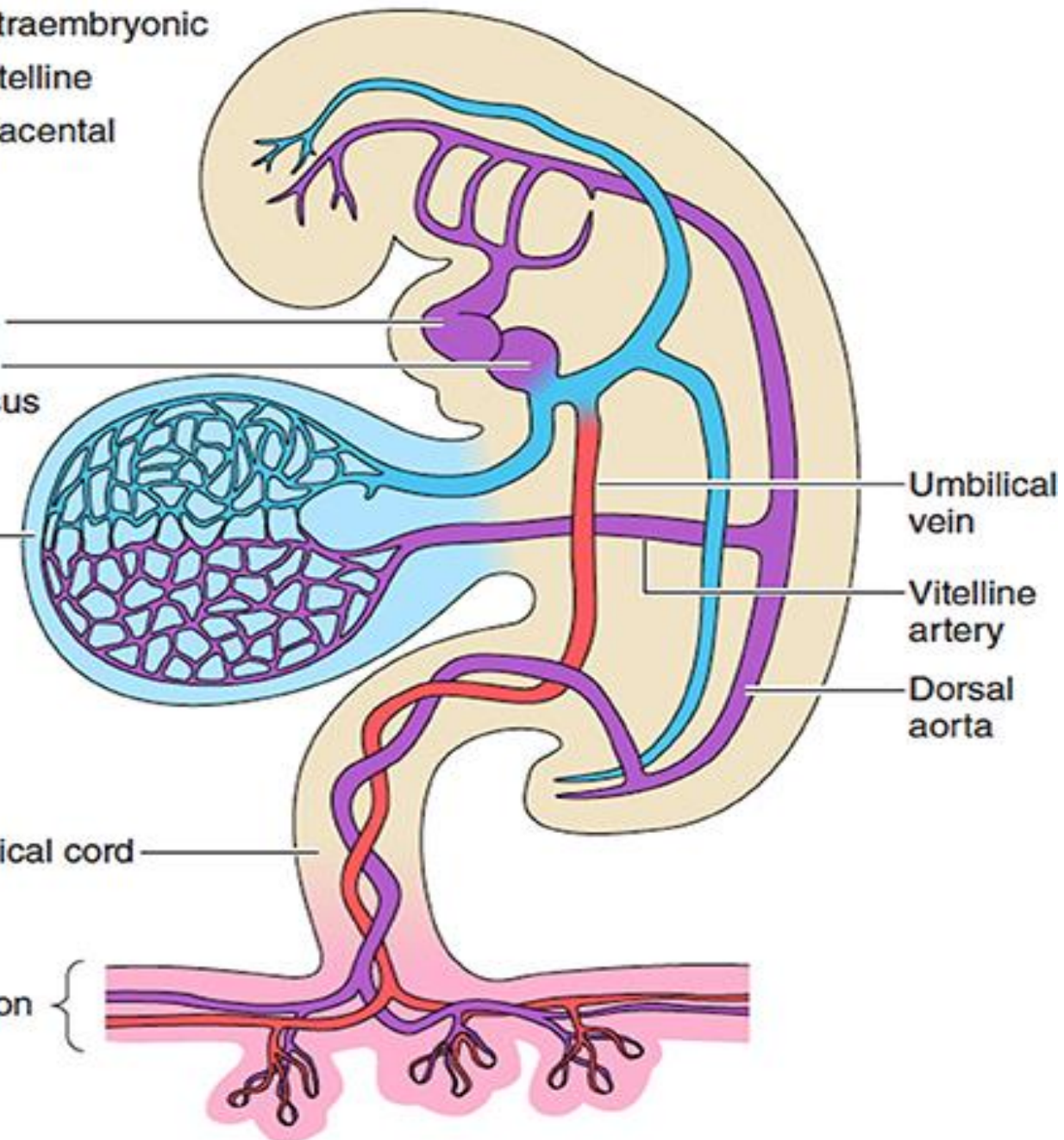
Umbilical  
vein

Vitelline  
artery

Dorsal  
aorta

Umbilical cord

Chorion



# The umbilical cord in pregnancy

- This is the baby's lifeline in the uterus
- 2 arteries (deoxygenated blood) and 1 vein (oxygenated blood)
- Blood flows freely between the baby and their mum through a low resistance circulation
- In obstetrics we use ultrasound measurements of this blood flow ('dopplers' and number of vessels) to assess a baby's wellbeing in the uterus before they are born
- Information from the cord influences important decision-making during pregnancy – when to monitor and when to deliver
- So the cord is important to obstetricians too!

# The umbilical cord in labour

- The cord can get in the way!
- Limbs/Back
- Around the neck
- Prolapses
- Reflected in the CTG
- Once again influences what we do and whether we intervene to expedite delivery
  
- At emergency LSCS - 'cord entanglement'

# The umbilical cord at delivery

- If the cord is left unclamped 'for a while' then some of the maternal blood from the placenta will flow towards the baby
- 'Placental transfusion'
- Increases the baby's blood flow
- 'Boost' blood flow to the baby's essential organs
  
- BUT for many years birth attendants immediately clamped and cut the cord after the baby had been delivered.
- Hmmmmmm.....

Then people began to do different things..

## Clamping Of The Umbilical Cord

Clamping of  
the umbilical  
cord

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graph LR; A[Clamping of the umbilical cord] --> B[Early clamping]; A --> C[Delayed clamping]; B --> D[In the first 30 sec - 3 min]; C --> E[After the pulsation is ceased];
```

Early  
clamping

In the first 30  
sec – 3 min

Delayed  
clamping

After the  
pulsation is  
ceased



# 'milking' or 'stripping' of umbilical cord

- Milking and stripping ; apply to the active practice of squeezing blood down the cord to the baby.
- The aim : shorten the time from delivery to clamping the umbilical cord while still providing up to 20 mL of placental blood.
- Milking the umbilical cord is not physiologic and may provide a rapid bolus of blood to the infant .
- Overall, it is not yet clear whether milking or stripping the umbilical cord is equivalent to delayed cord clamping, and further study is necessary.



# What is in Cord Blood



- RBCs
  - 15 mL/kg RBCs
  - Iron: 30 to 75 mg (enough for 3 to 6 mo's need)
- Stem Cells
  - Several million to 1 billion SCs
  - (and cytokines to direct them)
- Plasma/cells for volume expansion

# Delayed cord clamping

- People liked this
- Placental transfusion to boost the baby with essential red blood cells and extra 'healthy' blood volume (75-80 ml)
- Improves neonatal iron status
- Keeps over-zealous obstetricians (and midwives - but mainly obstetricians) from trying to pull the placenta out of the uterus before full separation, causing uterine inversion
- 'mild' neonatal stimulation/resus can be done close to mum, with the benefit of continued blood flow to baby from the placenta
- Feels 'kinder' and more natural
  
- BUT there were issues with preterm infants. (Neonatologists will fill you in)

# DCC is not ideal in certain situations:

- Placental abruption/PPH with retained placenta
- Multiple Pregnancy (especially monochorionic)
- Isoimmunization
- Fetal Hydrops
- Emergency delivery for fetal distress
- Baby with known fatal abnormalities

# There is a whole movement

## Cord Blood Banking

Would you remove your kidney just on the tiny off chance you'll need it more later than you do now? 99% of privately banked cord blood is never used.

Let Your Baby

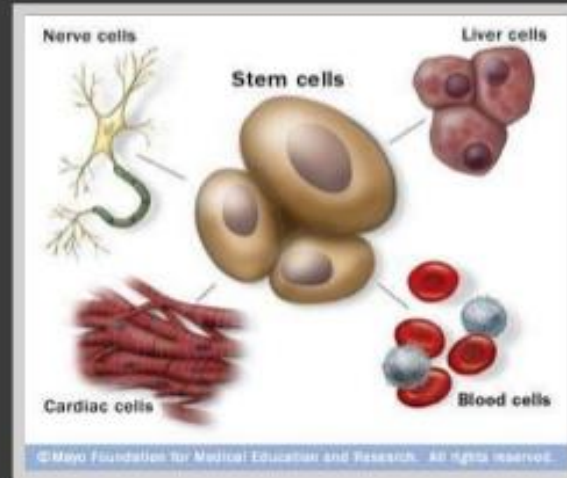
Keep Its Blood - Delayed Cord  
Clamping

Lower The Risks

Cutting the cord immediately means baby's body is immediately at a disadvantage, fighting to do all the things it needs to do after birth without full blood supply. Letting the baby get this blood lowers the risk of anaemia as well as many other possible short or long term complications.

# Lots of interest and opinion

## Stem Cells: Baby's First Transplant



“ ...a delay in cord clamping may  $\uparrow$  stem cell supply to the baby...innate stem cell therapy...acute benefits in case of NB disease....long term benefits against age-related diseases”

Tollasa JN, Park DH, Eye DJ, Krasko SK, Borlongan CV, Sanberg PR. ManKind's first natural stem cell transplant. *J Cell Mol Med*. 2010;14:488-495. Sanberg P, Park, D-H & Borlongan. (2009). Stem Cell Transplants at Childbirth. *Stem Cell Rev and Rep*

# A growing body of evidence



**Cochrane  
Library**

Cochrane Database of Systematic Reviews

## Background

Optimal timing for clamping the umbilical cord at preterm birth is unclear. Early clamping allows for immediate transfer of the infant to the neonatologist. Delaying clamping allows blood flow between the placenta, the umbilical cord and the baby to continue. The blood which transfers to the baby between birth and cord clamping is called placental transfusion. Placental transfusion may improve circulating volume at birth, which may in turn improve outcome for preterm infants.

## Objectives

To assess the short- and long-term effects of early rather than delaying clamping or milking of the umbilical cord for infants born at less than 37 completed weeks' gestation, and their mothers.

**Effect of timing of umbilical cord clamping and other strategies to influence placental transfusion at preterm birth on maternal and infant outcomes (Review)**



Which leads on to Liz's  
slides..