**CIRCULATION & THE CARDIOVASCULAR SYSTEM (CVS)**

**Assessing the neonatal circulation**

Assessing the adequacy of a neonate’s CVS includes: heart rate, pulse volume, capillary refill, perfusion, blood pressure, urine output, neurological state and skin colour/temperature (Johnstone and Smith, 2008).

**Signs of cardiovascular compromise**

* **Hypotension - low mean arterial blood pressure\*.**
* **Tachycardia** (HR>160/min in preterm, >140/min in term infants)
* **Impaired tissue perfusion**, which may be indicated by:
* **Capillary refill time >3 seconds**
* **Lactate >2mmol/l** on accurate analyser, or **base excess <-8mmol/l** with normal chloride.
* **Oliguria (low urine output)** <1ml/kg/hr, especially after 24 hours of age. Oliguria may be normal in the first day of life.

**\*Measurement of blood pressure**

Invasive monitoring via an umbilical arterial line or other site is the gold standard and should ideally be used in all neonates where circulatory compromise is suspected and while they are in intensive care. However, non-invasive monitoring is commonly used once umbilical artery access has ceased and the neonate’s condition improves.

**Interventions:**

Poor CVS status / poor perfusion requires ‘volume’ to be given – usually 10mls/kg normal saline or sometimes blood depending on the individual case. Caution must be applied however with giving too many boluses of volume to avoid overload when the kidneys are immature and/or compromised. Sometimes, inotropic support with a Dopamine infusion for example may be required to ensure an adequate blood pressure while a neonate is sick in intensive care.

Sources: Johnstone and Smith, 2008; Kent et al, 2009; Knight, 2012)