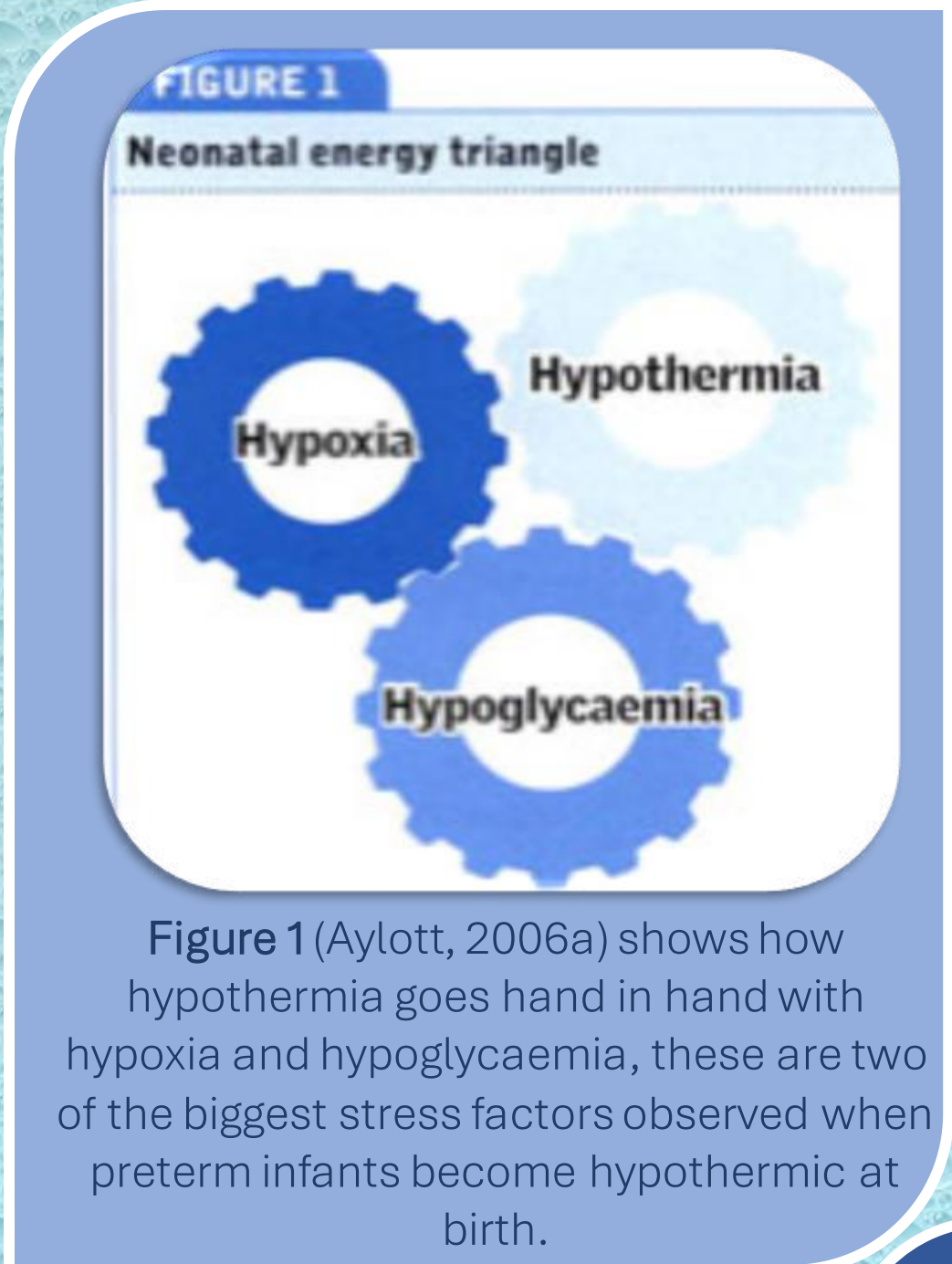


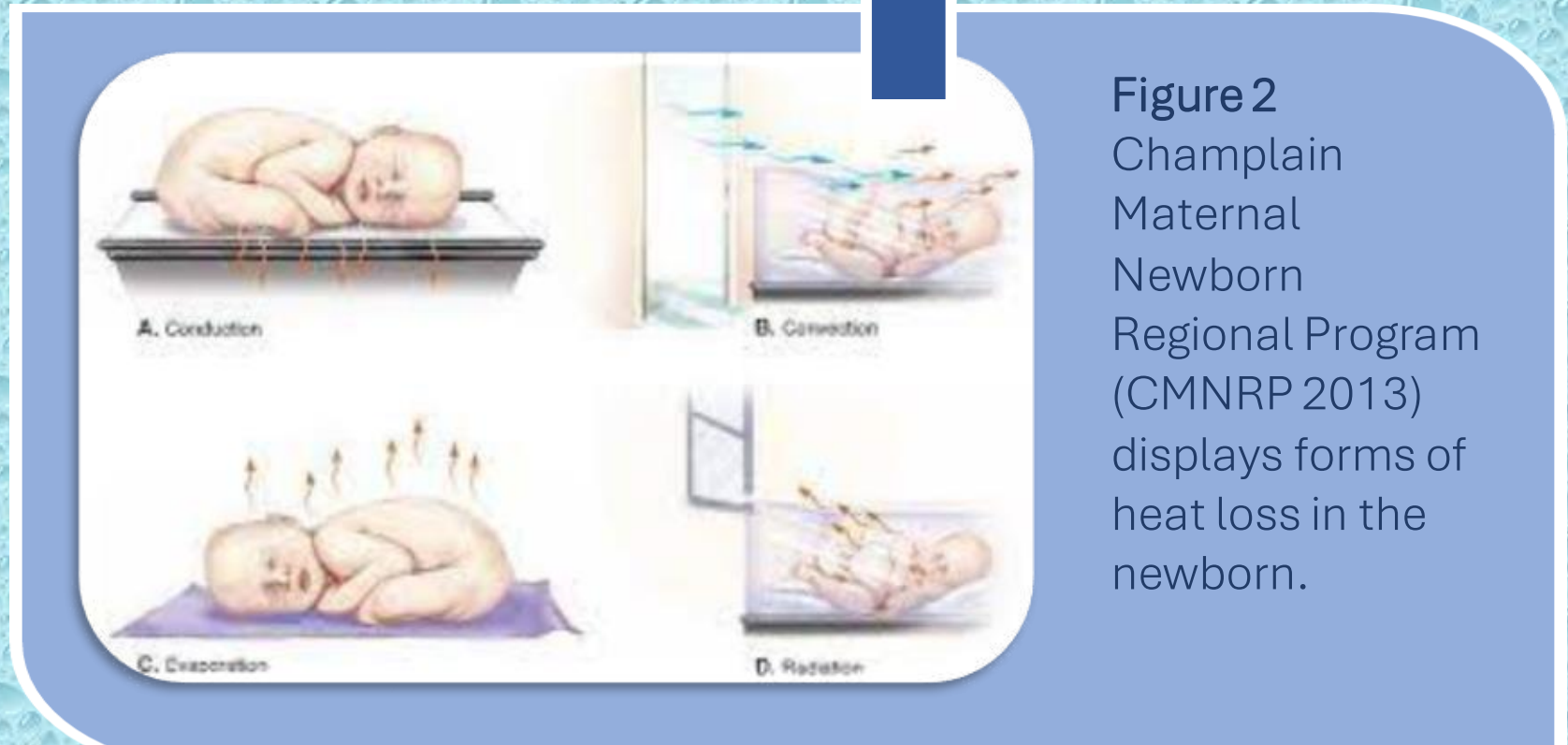
# Thermoregulation in preterm infants

The World Health Organisation (WHO, 2022) define an ideal core temperature as >36.5 degrees centigrade due to the adverse effects of hypothermia at birth. Balest (2023) supports with the ideal range of 36.5-37.5 degrees centigrade to decrease the risk of morbidity and mortality in preterm neonates. Cold stress on a preterm neonate can have adverse effects such as metabolic instability, burning of calories and brown fat leading to poor growth, poor circulation and the development of late-onset sepsis (Balest 2023, Aylott 2006a, Aylott 2006b and WHO 2022).



Hypothermia	Temp less than 36.5 degrees centigrade WHO, 2022
Hypoxia	Hypoxia occurs due to oxygen being used to assist the burning of glucose for heat production, the body's circulatory system is also slowed down when cold so is unable to maintain target oxygen saturations, placing additional stress on respiratory system (Aylott 2006a and Aylott 2006b).
Hypoglycaemia	Hypoglycaemia occurs when hypothermic due to glucose being used for heat production, hypothermia causes glucose production to slow down so the glucose being used for heat production is not replaced quick enough to maintain optimum blood glucose levels of 2.5mmols and above (WHO 2022, Balest 2023, Aylott 2006a, Aylott 2006b and WHO 2022).

Figure 3, R Stephenson 2024



## Convection in the Delivery Room

Convection in the context of the delivery room relates to the transition of baby from warm amniotic fluid to cooler air temperature of the delivery room and is exacerbated when baby is moved across the room to the resuscitaire (Knobel 2014 and CMNRP 2013) . Figure 3 shows the ideal process for effective thermoregulation in the transfer to resuscitaire from the uterus.

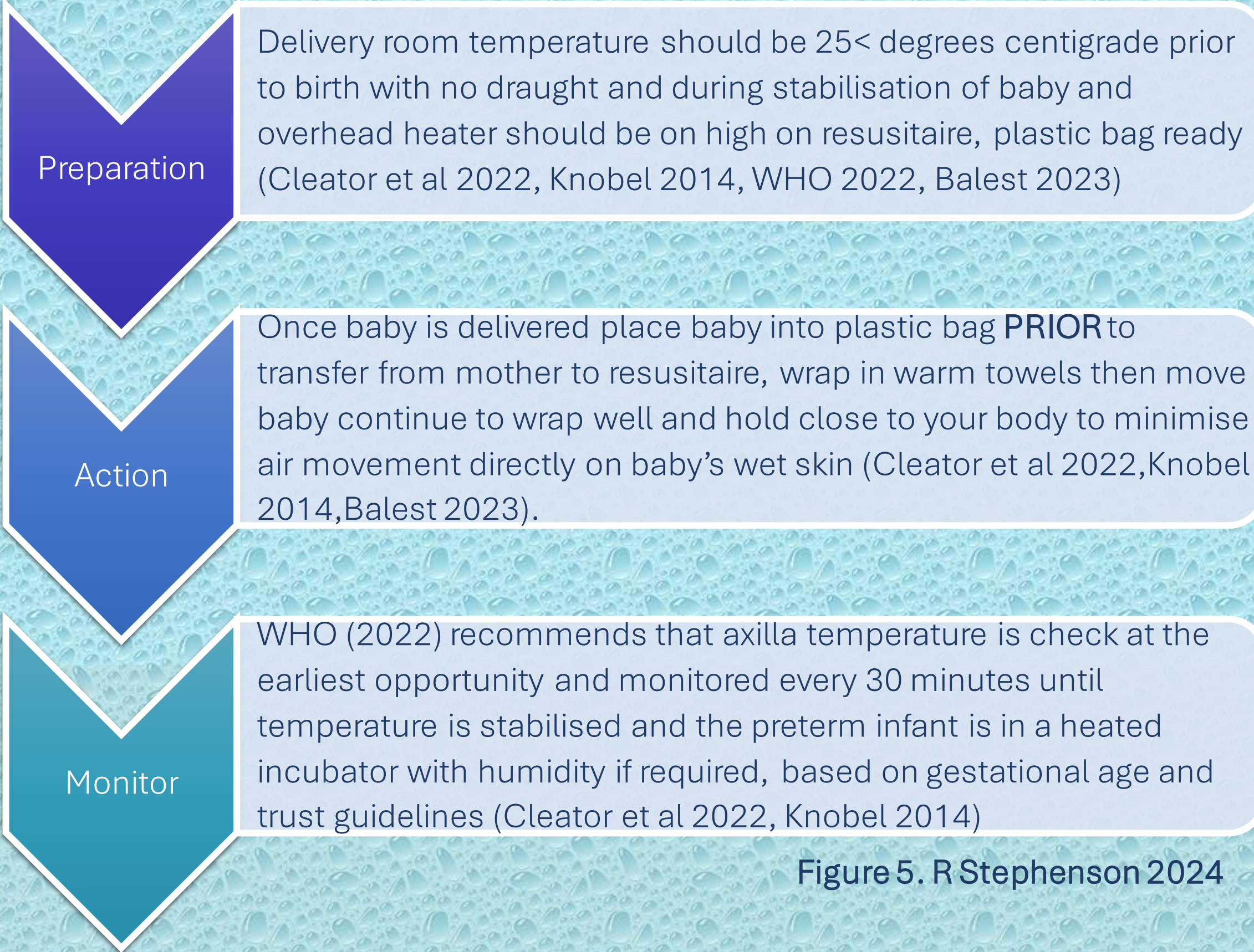
### Skin to skin in the delivery room

**Figure 4**, Baby Friendly Initiative (BFI 2023) displaying skin to skin.

Prolonged skin to skin (STS) is recommended by BFI (2023) to support maternal bonding, breastfeeding initiation, production of oxytocin and effective thermoregulation.

When a baby is born prematurely STS is not always facilitated as effectively due to medical stabilisation taking priority, Lode-Kolz's et al (2022) research showed effective STS at birth led to a decrease in neonatal hypothermia. Mehler et al's (2019) research compared brief visual contact at birth and prolonged STS with medical stabilisation of the neonate in the delivery room prior to admission to the neonatal unit. The results favour prolonged skin to skin at delivery. This method of thermoregulation gives parents the opportunity to be involved in their baby's care at the earliest part of their journey, whilst ensuring a therapeutic environment BFI (2023) recommend family integrated care and this allows parents to be leaders in their baby's care.

Positioning during STS is important, "kangaroo hold" is often favoured due to the closeness between the baby and their parent (BFI 2023). With extreme preterm infants the side lying with midline head position is recommended by Blackett et al (2022) due the increased risk of interventricular haemorrhage within the first 72 hours of life.



### Risks to be aware of:

- **Hyperthermia** – Li et al (2016) completed a systematic review of results from studies using a plastic bag at birth for preterm infants to prevent hypothermia. Though the results were mostly positive as hypothermia rates decreased some studies reported incidences of hyperthermia. Outcomes of the review recommended that staff education and monitoring is of a high standard to prevent this from reoccurring (Li et al, 2016). This ensures beneficence and nonmaleficence is upheld to provide effective and safe practice (Nursing and Midwifery Council, NMC, 2023).
- **Distress to parents** - seeing a small, preterm infant being placed into a plastic bag can be scary to parents observing this. Where possible Knobel (2014) recommends preparing parents for what they will see after baby is delivered and why these measures are taken. This can covers nonmaleficence by preventing further mental distress and confusion to parents whilst providing beneficence by preventing hypothermia (Knobel 2014, NMC 2023)