Mild Hypothermia

Anesthetic Pearls: Anesthetic Implications of Mild Hypothermia

Definition of Mild Hypothermia: 34-36° Celsius

Physiology of Hypothermia (three phases):

1. Initial heat loss by redistribution from core to periphery (first hour).
2. Slow decline as cutaneous heat loss greater than heat production (next 2-3 hours).
3. Eventual plateau decline of core temperature from previously mentioned centrally mediated vasoconstriction that prevents further heat loss.

Vasoconstriction is body's temperature regulatory response under general anesthesia (patient is unable to shiver or move to a warmer environment). The vasoconstriction threshold is decreased with all general anesthetics by approximately 2-4 °Celsius (brain does not vasoconstrict the periphery until patient colder than usual low-end set point). Regional anesthesia also blunts the vasoconstriction regulatory response.

Advantages of Hypothermia:

- Cerebral protection by decreasing $CRMO_2$ by 8% per degree Celsius decreased.
- May potentially decrease the severity of Malignant Hyperthermia.

Complications of Hypothermia:

1. Increased incidence of myocardial ischemia / infarction (increased plasma Epi, NorEpi, HTN)
2. Increased blood loss and transfusion requirements (decreased pro-coagulant activity)
3. Increased incidence of surgical wound infections
4. Increased hospital length of stay (20% increase)

Detection: Core temperature best approximated by pulmonary artery, distal esophagus, tympanic membrane, and nasopharyngeal

Treatment:

1. Begin warming measures before the patient begins to decrease temperature less than 36°C.
2. Forced-air warmers (best)
3. Heated water pad (only warms 1/3 of skin area)
4. Fluid warmer (1 Liter of fluid at 20°C can decrease core temperature by 0.25°C)
5. Insulation (wrap exposed parts in blankets or plastic [**especialiy neonates**])
6. Heat / humidify inspired gases (respiration accounts for ~10% of heat loss, so will not significantly help to re-warm a hypothermic patient).
7. Ambient room temperature increase