Warming methods for protecting against hypothermia

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Hypothermia impairs immune function, reduces tissue oxygen delivery and is associated with reduced wound healing. Furthermore it reduces platelet function, impairs the activity of the coagulation cascade with consecutively increased blood loss and the need for allogeneic transfusions. In addition, mild hypothermia increases the incidence of ventricular tachycardia and morbid cardiac events.

On September 29th and 30th 2011 a workshop “Detection, Prevention and Treatment of Accidental Hypothermia.” was organized by the Section Patient Monitoring of the German Society for Biomedical Engineering (DGBMT) of the Association for Electrical, Electronic and Information Technologies (VDE). Here are the results regarding warming methods for restoring or maintaining normothermia.

The principal methods are external warming, internal warming and extracorporeal warming.

External methods are applying warming devices “around the body shell”: insulation, elevated ambient temperatures, infrared radiation, forced-air warming, conductive warming with under body mattresses or over body blankets, humidified and / or warmed inspired air and warm water immersion. Internal warming methods are invasive practices for active core temperature elevation: warmed infusions, warming with intravascular warming catheters and extracorporeal warming with or without hemodynamic support.

The clinical warming strategy depends on the severity of hypothermia (mild, moderate or deep) and on the respective local “warming-device infrastructure”.

Any method or combinations of methods have the aim to achieve or maintain core temperature above 36°C.