CLINICAL PATHWAY FOR THE PREVENTION OF PERIOPERATIVE HYPOTHERMIA IN THE CANDIDATE FOR MAJOR ONCOLOGICAL SURGERY: EFFECTIVENESS AND AREAS OF IMPROVEMENT.

C. Ferraris, V. Karakotch, E. Malja, M. Boezi, S. Siligardi, G. Cipriani.
Complex Operative Unit of Anesthesia and Reanimation - San Pietro Hospital - Rome

Aim. Unintended perioperative hypothermia is common in surgical patients and is related to significant morbidity and mortality. Monitoring of body temperature and avoiding the unintended perioperative hypothermia using active warming techniques are key factors of prevention of complications including surgical infection, delayed wound healing, adverse myocardial events, and increased bleeding. This study intends to verify the effectiveness of an internal management program, dedicated to major oncological surgery, aimed at the prevention of perioperative hypothermia and planned according to the indications contained in the guidelines and the best practices that deal with the topic.

Materials and methods. The care path has been applied to 200 patients. In all the perioperative phases, the central temperature of the patients was monitored with not invasive zero-heat-flux technology Bair Hugger system. Patients received an optional preoperative and mandatory intraoperative warm up a forced air system Bair Hugger in association with underbody blankets. Infusion fluids were actively heated in all the interventions using the standard Ranger IV system. For each patient the demographic and anamnestic parameters were recorded as well as quantitative and qualitative indicators indispensable for a correct evaluation of the patients outcome.

Table 1. Characteristics of the patients and environments	
Enrolled patients (n°)	200
Males (%)	55.5
Females (%)	44.5
Age (years), mean±SD	68.5 ± 12.5
A.S.A. (%) I	11
- II	47
- III	41
- IV	1
Temperature in O.R. (°C), mean±SD	19.4 ± 0.5
Duration of surgery (min), mean±SD	205.4 ± 67.3
Prewarming patients (%)	66
No-prewarming patients (%)	34
Duration of prewarming (min), mean±SD	18 ± 6.5
Permanence in P.A.C.U.* (min), mean±SD	49.7 ± 21.1
Patients VS hospital ward (n°)	120
Patients VS I.C.U. (n°)	80

* only 120 patients VS hospital ward

Results. In OR, at the end of the procedure, 7,5% of the patients showed a T<36°C. Of these, 13 presented mild hypothermia, 1 moderate hypothermia, 1 deep hypothermia. Prewarming was performed on 66% of patients, the remaining 34% refused. 15 patients showed T<36°C, 66% of them were in no-prewarming group. The difference in temperature found in patients between two groups in Pre-Anesthetic Care Unit and during the induction (in OR) results statistically not significant. In all the intraoperative phases and at the end of the intervention, the difference detected is statistically significant (p<.05). Only weak negative correlations between the temperature (<36°C) recorded at the end of the intervention and ASA, age and duration of the interventions. A case of postoperative shivering was reported, 90% of patients declared maximum comfort status and 93% felt no pain. At 5 minutes after entry into PACU, 60% of patients were completely awake and at 20 minutes, the percentage rose to 89%. In PACU and in the next 24 hours, no complications were found in any patient. The average time spent in PACU was 49±21 minutes.

Table 2. Incidence of hypothermia at the end of surgery			
Severity of the hypothermia	Patients (n°)	No-prewarming (n°)	Prewarming (n°)
Mild (35.9 - 35.5°C)	12	8	4
Moderate (35.4 - 35.0°C)	2	1	1
Profound (34.9 - 34.5°C)	1*	1	0

*underbody blanket not use because not available.

Table 3. Aldrete Score, (n=200)						
Point Value	I ^a Evaluation			II ^a Evaluation		
	2	1	0	2	1	0
Activity	90	7.5	2.5	92	6	2
Respiration	76	24	0	94.5	5.5	0
Circulation	65.5	34.5	0	84	16	0
Saturation	59	41	2.5	87.5	12.5	0
Consciousness	60	37.5	0	89	9	2

I^a Evaluation: after 5 minutes from entry into the recovery room.

II^a Evaluation: after 20 minutes from entry into the recovery room.

References

- Eshraghi Y. Et al., 2014. An evaluation of a zero-heat-flux cutaneous thermometer in cardiac surgical patients. Anesth.
- Horn E.-P. et al., 2012. The effect of short time periods of pre-operative warming in prevention of perioperative hypothermia. Anesth.
- Kurtz A. et al., 1996. Perioperative normothermia to reduce the incidence of surgical-wound infection and shorten hospitalization. N Engl J
- Yilmaz M. et al., 2008. Impact of preoperative warming on maintenance of normothermia and outcome after colorectal surgery. Anesth.
- Tominaga A. et al., 2007. Efficacy on an underbody Forced-Air Warming blanket for the prevention of intraoperative hypothermia. Anesth.
- Siaarti, Clinical Practice Guideline 2001. Recommendations on perioperative normothermia.
- Siaarti, Clinical Practice Guideline 2010. Recommendations for the recovery area and post-anesthesia care.
- NICE, Clinical Practice Guideline 2008. Hypothermia: prevention and management in adults having surgery (Last update December 2016).
- Siaarti, Good Clinical Practices 2017. Perioperative Normothermia.

Euroanaesthesia 2018
The European Anaesthesiology Congress