A549 - Comparison of cardiac index (ci) estimates by body surface temperatures combined with biometric data (ci_cin), uncalibrated clearSight and flotrac vs. transpulmonary thermodilution derived ci_td

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Introduction:
Body surface temperature BST provide a rough estimate of cardiac index CI. Non-contact infrared thermometers (Thermofocus; Tecnimed) more accurately measure BST than clinical examination. We hypothesized that accurate measurement of BST combined with biometric data might provide a complete non-invasive estimate of CI (CI_CNI) with similar accuracy as the uncalibrated devices ClearSight (CI_CS) and FloTrac (CI_FT; both Edwards Lifesciences). Therefore, we compared CI_CNI to CI_CS, CI_FT and to the gold-standard CI_TD derived from transpulmonary thermodilution (TPTD; PiCCO).

Methods:
In 22 patients (APACHE-II 28+6) a total of 176 datasets were recorded (8 datasets per patient within 24h; study period 7/2017-11/2017). Immediately before TPTD we measured BST on the forehead, forearm (middle and distal), finger and great toe and recorded un-calibrated CI_CS and CI_FT. These data were compared to TPTD-derived CI-TD.


Results:
Multiple regression analysis (R2=0.572) including BSTs and biometric data demonstrated independent association of CI_TD with BST_forehead (p<0.001), BST_middle_forearm (p=0.001), young age (p<0.001), male gender (p<0.001), height (p<0.001) and low weight p=0.021). This regression formula resulted in CI-CNI. Bias and percentage error compared to CI_TD were -0.04 L/min/m2 and 49% for CI_CNI, -0.10 L/min/m2 and 65% for CI_FT and -0.85L/min/m2and 60% for CI_CS, respectively.
The ROC-AUCs regarding CI_TD>=5 L/min/m2and CI<=.5 were 0.92 and 0.79 for CI_CNI (both p<0.001), 0.79 and 0.63 (p<0.001 an p=0.6) for CI_FT, and 0.89 (p<0.001) and 0.68 (p=0.08) for CI_CS.

Conclusion:
BSTs combined with biometrics provide an estimate of CI (CI_CIN) which is least comparable to CI_CS and CI_FT.