

# Usefulness of temperature monitoring system TEMPLE TOUCH PRO™ in off-pump coronary artery bypass surgery

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## Introduction

Monitoring and maintaining body temperature is important in anesthesia management because intraoperative hypothermia causes various perioperative complications. TEMPLE TOUCH PRO™ (TTP, manufactured by MEDISIM LIMITED), a continuous core temperature monitoring system, is a device that allows non-invasive and simple measurement of core temperature by attaching a sensor to temple [Fig. 1].

In this study, we examined the usefulness of TTP by comparing with the pulmonary artery temperature in off-pump coronary artery bypass surgery (OPCAB).

## About Temple Touch Pro

TTP measures the heat flow from the temporal artery to the skin surface with a sensor attached to the temple, and calculates the core temperature [Figs. 2 and 3].

Figure 1. TTP and Sensor



Figure 2. TTP Technology

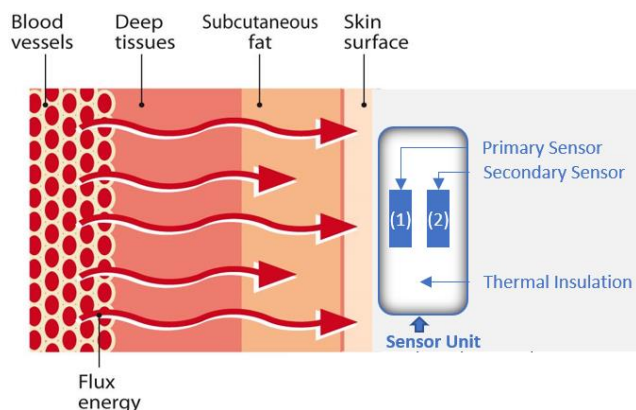


Figure 3. Attaching Sensor



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## Method

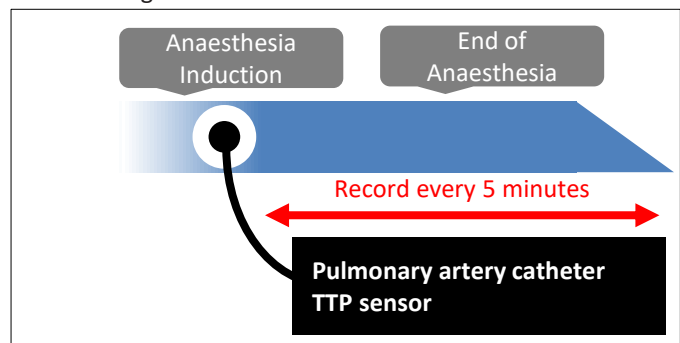
This study was reviewed and approved by the ethics committee of Sapporo Medical University Hospital and Obihiro Kosei Hospital (approval number: 272-53, 2016-008), and we obtained written informed consent from all patients.

- 7 adult patients need to undergo OPCAB under general anesthesia [Table 1]
- After induction of general anesthesia, and placement of a pulmonary artery catheter (model 744F75, Edwards Life Science) from the right internal jugular vein, a TTP sensor was attach to the temple. The pulmonary artery temperature (PAT) and the core temperature were measured by TTP (TTTP) every 5 minutes [Fig. 4].
- Statistical correlation, Bland-Altman analysis

Table 1. Patients' Background

	Mean ± SD	Range
Age	71 ± 7	58-80
BMI [Kg/m2]	23.1 ± 2.8	19.8-27.7
Anesthesia Time [minutes]	359 ± 59	240-412
Surgery Time [minutes]	281 ± 55	171-332

Figure 4. Measurement Protocol



## Result

Data set of 407 points and 7 cases were analyzed [Figs. 4 and 5]. There were no complications associated with sensor attachment found in all cases.

## Discussion

Compared to other measurement methods (pulmonary artery temperature, esophageal temperature, bladder temperature, rectal temperature, etc.), TTP is non-invasive, easy to use, and allows accurate measurement. In addition, the time required from setup to start of measurement is short, and a stable temperature can be displayed only a few seconds. For cardiac anesthesia, TTP is highly useful because there is not enough space of the forehead due to the attachment of other monitoring sensors (BIS, INVOS, etc.)..

## Conclusion

It was suggested that TTP could be used for accurate monitoring the core temperature during OPCAB cases. With non-invasiveness and convenience of use, further clinical use can be expected.

Source: 22th Japanese Society of Cardiac Anesthesiologists, September 16th-18th, 2017

Figure 4. Pearson's correlation

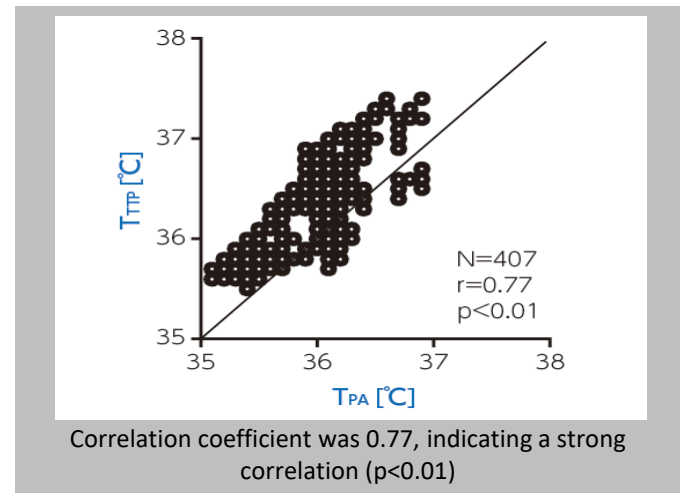
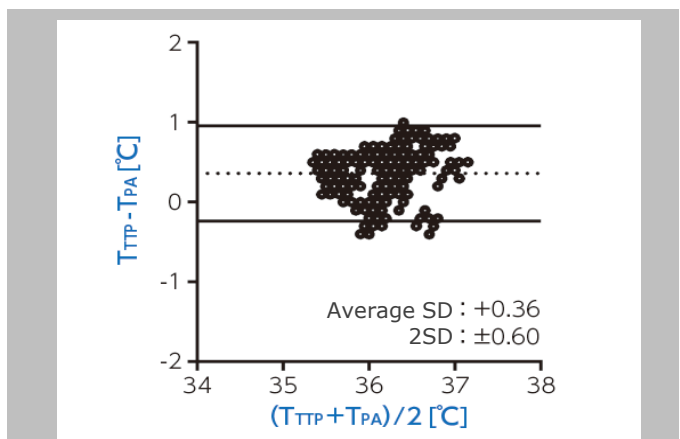


Figure 5. Bland-Altman plot



The average SD was +0.36 and 2SD were ±0.60, showing high accuracy