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## Thermometer Checks

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### 1. PURPOSE

The purpose of this work instruction is to outline the steps to be undertaken when checking the accuracy of thermometers which are used within the HSCT Programme. Note, thermometers in the Cell Therapy and Flow Cytometry Laboratory are checked according to standard operating procedures authorised by Laboratory Services.

### 2. ACTIONS

#### 2.1 Background

All working thermometers used by the HSCT Programme are digital and carry a unique identification number, the reference digital thermometer, used to perform the checks, is maintained and available from Laboratory Services. The unique identification number, allows each working thermometer to be traced back to the relevant record of check undertaken (performed every 6 months) and is in accordance with AS 4633 (ISO 15189) NATA Application Document – Supplementary Requirements for Accreditation in the Field of Medical Testing (August 2007) (QS-E-002).

- All digital working thermometers will be checked every 6 months at ice point, 4°C and ambient temperature, (representative of the working range) against the reference digital thermometer. Readings will be recorded on the Thermometer Check Record, QS-F-010 for each thermometer.

#### 2.2 Set Up

- Ensure that the digital reference thermometer is available from Laboratory Services, to perform the thermometer checks.
- Fill a glass beaker with approximately 400ml deionised water, cover and store at 4°C overnight, to use for 4°C check.

#### 2.3 Preparation on the Day

- For an ice point check, prepare an ice slurry, by filling a suitable vessel with finely crushed ice and deionised water to just below the ice surface. Mix thoroughly until the ice slurry no longer appears opaque and drain until there is no free water.
- Place the ice slurry vessel in an insulating bath.

#### 2.4 Visual Checks of Thermometers

- Prior to undertaking calibrations or checks, ensure that both the working and reference thermometers appear to be in good working order, ie probe integrity, faded or flashing digital readout. Note batteries are changed at least annually.
- If defect is found, consider commissioning of replacement thermometer and check records and outcome recorded by the particular thermometer. Records include Manual Temperature Monitoring, QS-F-009, Equipment Quality Control Failure Record, QS-F-006 and past performance verification recorded with the Thermometer Check Record, QS-F-010 for the respective thermometer concerned.

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### 2.5 Ice Point Check

- Immerse the reference and working digital thermometers in the ice slurry ensure that the probe's measuring tip is fully immersed in the ice slurry. Allow equilibration time of approximately 30minutes.
- Record the temperature of both thermometers on the Thermometer Check Record, QS-F-010 and for the reference thermometer, complete the Laboratory Services Record; Reference Thermometer Record (LS-F-001b).

**NOTE:** If the reference digital thermometer does not record 0°C, notify the Laboratory Services Quality Manager who will evaluate and action the problem.

### 2.6 4°C Check

- Immerse the reference and working digital thermometers in the beaker of deionised water (stored overnight at 4°C). Replace the beaker in the refrigerator and allow to equilibrate for approximately 30 minutes.
- Record temperatures on record QS-F-010.

### 2.7 Ambient Temperature Check

- Allow the reference and working digital thermometers to equilibrate in a defined ambient temperature (20-24°C) controlled area for approximately 30 minutes.
- Record temperatures on record QS-F-010.

### 2.8 Completion of Record QS-F-010

- Refer to the test certificate supplied with the Reference Thermometer to determine the required Corrected Reference Thermometer temperature.
- Complete the calculations on the QS-F-010 for each thermometer for each reading.
- If the working thermometer's recorded temperature is NOT within  $\pm 1^{\circ}\text{C}$  of the reference thermometer, consult the Quality Manager for further advice. A correction may be applied.
- If indicated, place a permanent tag on the working thermometer stating the correction to be applied, so the recording of future temperatures can be adjusted accordingly.
- Submit all completed QS-F-010 records to the Quality Manager for authorisation and filing. Update the "check date" and sign the respective working thermometer.

## 3. REFERENCE DOCUMENT

QS-P-007 Equipment Operation, Maintenance and Monitoring Procedure.