

Microtransducer Tipped (pressure) Catheters (MTC) - fault diagnosis

Non-specific reported faults are frequently made by end users when reporting any difficulties with these devices. The more frequent expression is just given as 'unstable' catheter. To assist us in supporting you please quantify the extent of the 'instability' and under what conditions. Also be aware that the manufacturers notes which accompany these devices advise that there will be a normal small baseline off set under the following conditions;

- Warming over the first 5 minutes from turn on (commonly about 3-5 cm H₂O equivalent).
- Relocating the catheter, after setting the recording baseline in open air, into a liquid as the membrane covering the sensor is slightly hygroscopic and will cause an offset as it changes its tension on the underlying sensor diaphragm. Zero balance the catheter after it has been wetted.
- Relocating the catheter, after setting the recording baseline in open air, into a liquid as the liquid will often change the sensor temperature. Either wait for the sensor temp to again reach an equilibration temperature and then re-zero, or simply carry out the first zero balance only after the sensor has been in its (wet and non-ambient temp) recording environment for 5-8 minutes.

OTHER CAUSES OF INSTABILITY

'Unstable' can be either an unstable baseline or a varying gain (or sensitivity). As in normal use of the catheters is not obvious, unless carrying out a three or four point linearity test, most comments received relate to baseline drifting.

1. An unstable baseline is caused (in order of frequency of occurrence in the field) by:
 - a) Fluid ingress into the reference pressure lumen (opens inside the connector) creating a trapped, varying volume, air bubble as the reference pressure to the back of the sensor.
 - b) Intermittent sensor bridge conditions due to internal oxidation or corrosion of the strain gauge element due to fluid ingress usually through a damaged section of the catheter body.
 - c) Loss of thermal compensation of the sensor bridge due to defective compensatory resistors (in the plug).
2. To give a rough check on 1 (a), connect the MTC to the recording system, hold the catheter horizontal and zero balance. Now rotate the catheter from the horizontal to a vertical orientation (say right hand down), move it back back to horizontal and then again vertical (with left hand down). Fluid movement in the reference lumen will usually show up here as a changing baseline recording.

Leave the catheter on the bench with the recording system running on a slow scroll speed and checking on the baseline. Baseline wandering with a stationary catheter may well indicate either 1 (b) or 2 (c) as a possible cause.

