The Causes of Drift During Physiological Stenosis Assessment

Cause of Drift	Mechanism of Drift	Recommendations for Best Clinical Practice
Procedure-related causes of drift		
Variability of the aortic pressure transducer height	Varying the transducer height can alter hydrostatic forces and influence the Pa	Ensure that the transducer is fixed to the table at a reference height at the level of the aortic root (5 cm below the sternum)[12]
Inappropriate pressure wire calibration	Inappropriate calibration establishes an incorrect 0 Pd	Ensure the pressure wire tubing is adequately filled with saline and wait ≈60 s to have the wire completely and stably wet. Calibration (establishing zero pressure) can then be performed at this stage
Debris on the pressure wire connector	Any blood or saline remnants on the connector may interfere with the Pd recording	Ensure the connector is kept dry and free from debris, especially during the unpacking and flushing process before calibration
Not removing the needle guidewire introducer	The space around the wire within the introducer may introduce leak and decrease aortic pressure (Pa) by 0–5 mm Hg[12]	Ensure the needle guidewire introducer is removed and the O-ring tightly closed before all measurements including normalization, FFR, iFR, and whole-cycle Pd/Pa measurements and the verification for pressure wire drift at the end of a procedure
Using guide catheters with side holes	A pressure gradient can exist between the side holes and the tip of the catheter because of the stenotic effect within the catheter itself[13]	Ensure the guide catheter with side holes is disengaged from the ostium, while leaving the pressure wire in the distal vessel during the measurement
Contrast medium in the catheter	Contrast can cause damping of the aortic pressure waveform	Ensure the guiding catheter is adequately flushed with saline prior to equalization
Excessive intubation of the guide catheter in the coronary ostium	Wedging of the guide catheter can damp the proximal aortic pressure signal	Ensure the aortic pressure trace is not damped and optimize and stabilize guide catheter position if possible. Alternatively, disengage from the ostium and leave the pressure wire in the distal vessel during the measurement[12]
Pressure wire-related causes of drift		
Temporal-mediated pressure wire signal drift	A gradual degradation of signal output of the sensor over time can make Pd readings offset from the original calibrated state. This is an intrinsic property of electric pressure wire systems	Ensure the pressure wire system is flushed with room temperature saline at the beginning of any procedure. After every measurement, the pressure sensor-tipped wire should be pulled back to the guiding catheter to recheck the calibration. Any pressure wire drift greater than ±2 mm Hg should be recalibrated and the measurement repeated. NB: High fidelity electric pressure wires make the problems of temporal and temperature related signal drift less likely because of built in compensation mechanisms. Specified levels of performance (drift <7 mm Hg/hr) are mandated.[14] If temporal/temperature mediated pressure wire drift occurs, it is normally early on in the procedure, after which it is normally stable[14]
Temperature-mediated pressure wire signal drift	Small temperature changes can produce physical changes in pizeoelectric materials and device characteristics leading to Pd signal drift. This is an intrinsic property of electric pressure wire systems	

FFR indicates fractional flow reserve; iFR, instantaneous wave-free ratio; NB, nota bene; Pd, distal pressure; and Pa, proximal pressure.

Cook C et al. Quantification of the Effect of Pressure Wire Drift on the Diagnostic Performance of FFR, iFR, and Whole-Cycle Pd/Pa. Circ Cardiovasc Interv. 2016;9(4):e002988.