

Scisense Pressure Publication Brief

Validation of a New Micro-Manometer Pressure Sensor for Cardiovascular Measurements in Mice

Trevino RJ, et al. Biomedical Instrumentation & Technology 2010

OBJECTIVE

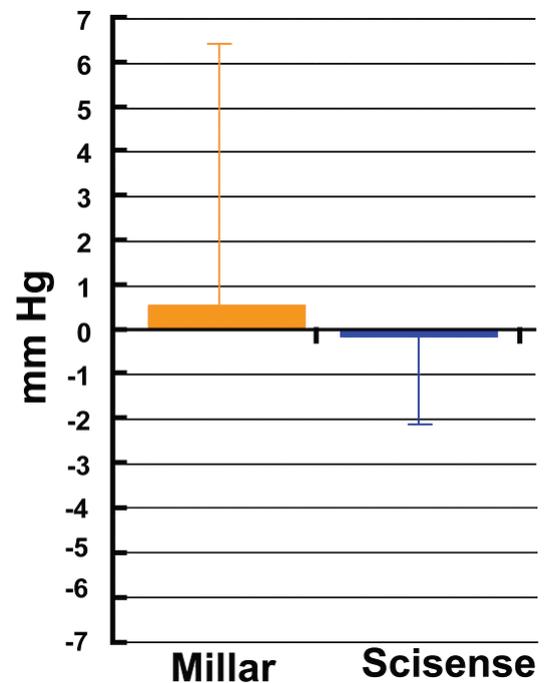
Compare the performance of the 1.2F Scisense Pressure Catheter to the 1.4F Millar Catheter in a series of *in vitro* and *in vivo* experiments.

METHODS

- A total of nine 1.4F Millar and eleven 1.2F Scisense Catheters were used for all experiments. Each protocol used between 3-6 Catheters of each brand.
- *In Vitro* assessments were made for Temperature Drift and Frequency Response up to 250 Hz.
- A Pop Test was used to determine natural frequency and damping coefficient.
- *In Vivo* Isoproterenol Dose Response and Dobutamine Dose Response tests were used to assess dP/dt performance.
- Pressure Drift post intervention was examined over a 45 minute period.
- Simultaneous Left-Ventricular Pressure Measurements were taken from both Catheters in the same LV during steady state, transient occlusion of the inferior vena cave, aortic pinch and arrhythmias.

RESULTS

- There was no significant difference in Frequency Response or the amount of Temperature Drift, though Millar tended to overestimate pressures while Scisense underestimated pressures.
- The natural frequency and damping coefficients as determined from the Pop Test were not significantly different.
- There was no significant difference in how the Catheters measured + dP/dt or -dP/dt in either dose response study.
- The pressure drift over 45 minutes was very low and not significantly different between the Catheters.
- There was no significant difference in the measurements of left ventricular peak systolic pressure, left ventricular end-diastolic pressure, +dP/dt, or -dP/dt for any condition.



Pressure drift over 45 minutes for a Scisense Catheter and a Millar Catheter.

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CONCLUSIONS

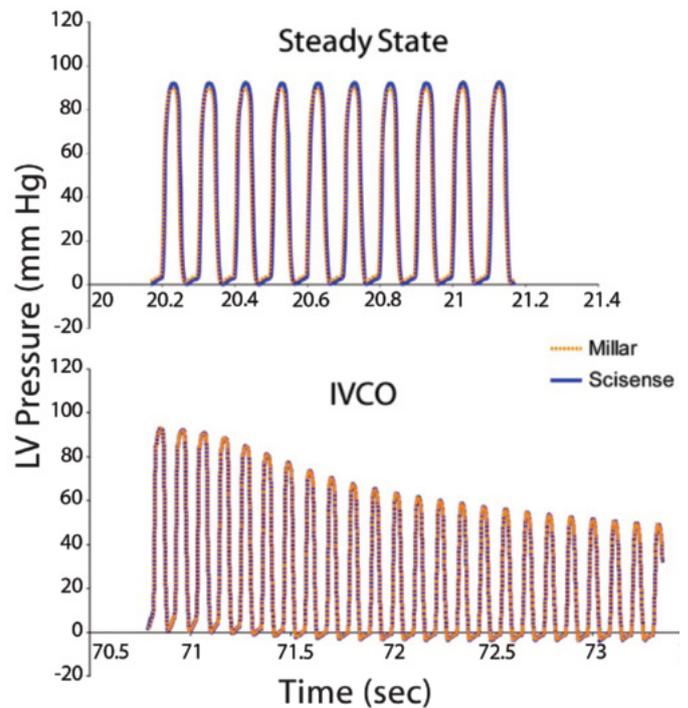
"We conclude that both sensors are equivalent, and that the Scisense pressure sensor represents an alternative to the current gold standard, the Millar micro-manometer pressure sensor for *in vivo* pressure measurements in the mouse."

TRANSONIC® SCISENSE COMMENTS

The Scisense Pressure Sensor recessed inside protective housing gives the same performance with smaller diameter (1.2F instead of 1.4F) and smoother Catheter tip profile.

REFERENCE

Trevino RJ, Jones DL, Escobedo D, Porterfield J, Larson E, Chisholm GB, Barton A, and Feldman MD (2010) "Validation of a New Micro-Manometer Pressure Sensor for Cardiovascular Measurements in Mice." *Biomedical Instrumentation & Technology*: January/February 2010, Vol. 44, No. 1, p. 75-83.



Simultaneous pressure measurements in a mouse LV by 1.2F Scisense Catheter and 1.4F Millar Catheter during steady state and IVC occlusion.