

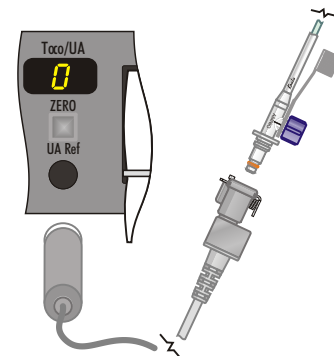
# Electronic Function of IUPCs

## Why the Need to Zero Anyway?

Good question. Intrauterine pressure systems convert pressures in the uterus into electronic signals by way of a pressure transducer. The pressure transducer, an electronic device which can reside inside or outside the catheter, then relays these converted signals to the fetal monitor.

The need for zeroing lies within the nature of electronics. All electronic devices, including transducers, monitors, cables and catheters, have small imbalances, or offsets, which need to be equalized when connected to each other.

The process of zeroing balances out any offsets, and verifies compatibility among electrical components. Now, with confidence in the proper electronic function of the system, clinicians can accurately monitor changes in intrauterine pressure.



**Zeroing is required to balance out offsets among the transducer, fetal monitor, cable and catheter.**

## True Zero is Just the Beginning!

In addition to providing a true zero in utero, the Koala Intrauterine Pressure System is designed to systematically eliminate IUP inaccuracies and optimize patient safety, comfort and ease of insertion:

- Small, soft catheter tip
- Circumferential pressure sensor
- Clear catheter lumen
- Round, stiff catheter tubing
- No electronics in the catheter
- U-shaped packaging
- Amnioinfusion port



CLINICAL  
INNOVATIONS

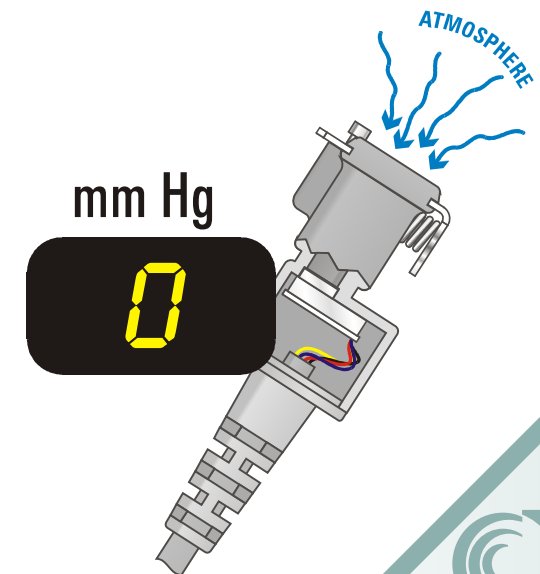
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## What is True Zero?

**Knowing might help reduce the risk of complications related to inaccurate intrauterine pressure monitoring**



# What is Zeroing?

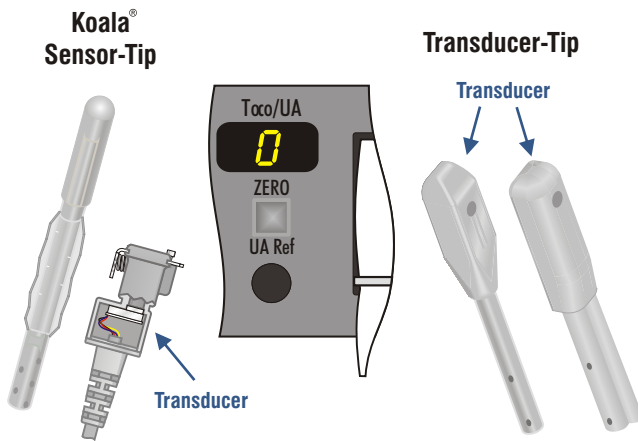
Zeroing is the process of establishing a starting point, or zero, on the fetal monitor from which changes in intrauterine pressure can be measured.

Pressing the zero switch on the fetal monitor when the monitor is receiving an electrical signal from the transducer ensures that no electronic offset from the catheter system or the fetal monitor is included in clinical readings.

## True Zero

A true zero is obtained by pressing the fetal monitor's zero switch when, and only when, the catheter system's transducer is exposed to atmospheric pressure.

Zeroing with the transducer exposed to atmospheric pressure provides the most accurate, or most "true", zero reading.



**The Koala Sensor-Tip System**  
True zero can be obtained anytime by disconnecting the catheter from the cable and exposing the transducer to atmosphere.

**Transducer-Tipped Systems**  
True zero can only be obtained prior to placement, when the transducer is outside the uterus.

# True Zero in Utero

Situations may arise where zeroing is required after catheter placement. Clinical reliability and electronic troubleshooting are enhanced by the ability to repeatedly obtain a true zero with the catheter in the uterus.

The Koala Intrauterine Pressure System is the only system that can obtain a true zero while the catheter is in utero. Because the transducer is located externally in the reusable cable, a true zero can be obtained anytime by simply disconnecting the catheter from the cable and pressing the zero switch on the fetal monitor.



The Koala provides a true zero in utero when the catheter is disconnected from the cable, exposing the transducer to atmosphere, and the fetal monitor zero button is pressed.

## Cable Re-Zeroing Buttons

Transducer-tipped systems claim that cable re-zeroing buttons provide a zero in utero. In truth, however, re-zeroing buttons only short out the transducers, temporarily suspending their signal to the monitor.

Therefore, when the re-zero button is pressed, only the monitor (the most reliable of the electronic devices) is re-zeroed, leaving catheter and other errors on the transducer inside the uterus.

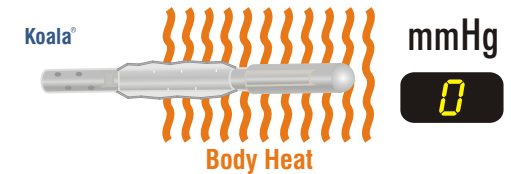
# Thermal Effects

Temperature changes, or thermal effects, are known to affect electronic pressure transducers, and may affect intrauterine pressure readings.

When transducers are in the tip of the catheter, the change from room to body temperature will affect the monitoring baseline. Thermal effects, combined with other sensitivities and offsets, can alter intrauterine pressure readings as much as  $\pm 8$  mmHg.

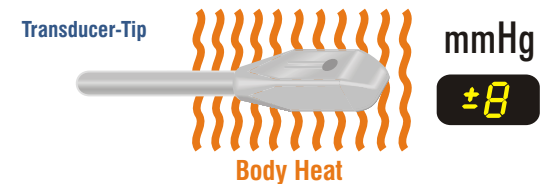
### Koala® Sensor-Tipped Catheter

With its transducer located externally in the reusable cable, the Koala is not affected by temperature changes.



### Transducer-Tipped Catheter

Transducer-tipped catheters are affected by thermal and other effects that can alter the monitoring baseline by as much as  $\pm 8$  mmHg.



## Clinical Implications

Improper electronic zeroing, thermal effects, and potential negative numbers may contribute to inaccurate intrauterine pressure readings and serious clinical implications:

- Unrecognized uterine hyperstimulation leading to fetal distress
- Increased cesarean section rate due to fetal distress
- Inappropriate management of oxytocin/pitocin
- Increased chance of uterine rupture