The Desaturation Response Time of Finger Pulse Oximeters during Mild Hypothermia.
MacLeod D.B., Cortinez L.I., Keifer J.C., Cameron D., Wright D.R., White W.D., Moretti E.W., Radulescu L.R., Somma J. *Anaesthesia.* 2005 Jan;60(1):65-71.

Introduction
Pulse oximeters may delay displaying the correct oxygen saturation during the onset of hypoxia. We investigated the desaturation response times of pulse oximeter sensors (forehead, ear and finger) during vasoconstriction due to mild hypothermia and vasodilation caused by glyceryl trinitrate.

Methods
Ten healthy male volunteers were given three hypoxic challenges of 3 min duration under differing experimental conditions.

Results
Mild hypothermia increased the mean response time of finger oximeters from 130 to 215 s. Glyceryl trinitrate partly offset this effect by reducing the response time from 215 to 187 s. In contrast, the response times of the forehead and ear oximeters were unaffected by mild hypothermia, but the difference between head and finger oximeters was highly significant ($p < 0.0001$).

Conclusion
The results suggest that the head oximeters provide a better monitoring site for pulse oximeters during mild hypothermia.