What (Perfusion Index indicator) is

A pulse oximeter is a device that analyzes the rate between oxygenated hemoglobin and reduced hemoglobin as arterial oxygen saturation (SpO₂). This difference is measured by the amount of light absorbed through the pulse of when light is transmitted through the finger.

On the basis of the measurement principle, a pulse oximeter may show unstable SpO₂ value and become unable to make measurement because of the following reasons:

- Excess noise caused by body movement or outside light (i.e., sunlight). (An indication of such would be that the pulse bar display will fluctuate.)
- Reduction of peripheral blood current due to arterial constriction or artery blockage
- With low perfusion, the amount of light which PD (photo diode) receives may become excessively high or low.

The larger the difference of light received by PD, the more accurate the measurement becomes. On the contrary, when the peripheral perfusion is low, the measurement value becomes unstable (SD becomes large).

Also, the peripheral perfusion could indicate low value due to compression of the part of the finger being measured, incorrect installation of a sensor probe, or body temperature decrease. PIi indicates fluctuation rate of received light with an indicator (PIi).

Especially when measurement time is short, in order to measure SpO₂ perfusion under the appropriate conditions, please observe the PIi.

The state of low perfusion:
Perfusion becomes low with peripheral vascular constriction under the following conditions:
- Cardiac arrest, shock, arteriosclerosis, temperature decrease of fingers, compression of fingers (non invasive blood pressure measurement, etc.), arteriosclerosis obliterans, Buerger’s disease (inflammation), Raynaud’s disease (vascular constriction), etc.

UBIX displays perfusion by an easy to understand four step indicator index (PIi).

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**Perfusion Index indicator**

**“The relationship between pulse beat and light received by PD”**

**“Relationship between difference of amount of light and PIi display”**

**Formula of perfusion index indicator and (PIi) Perfusion Index indicator display”**