

Make the Right Connection Guide



Perfusion Index (PI_r)

**A Quick, Easy-to-use, Clinical Tool for a Dynamic
Numeric Reflection of Perfusion at the Sensor Site.**

 **Datex-Ohmeda**
Devoted to caring for life

PI_r is a valuable clinical tool for everyday use

“What is Perfusion Index (PI_r)?”

- a numeric quantifiable value indicating the strength of the plethysmographic signal at the sensor site
- a simple assessment of perfusion or blood flow at the sensor site
- a relative value that varies from patient to patient

“How can I use PI_r in my daily practice?”

- rapidly locate the sensor site with the strongest pulse signal by comparing the perfusion index at different patient sites*
- increase the validity of the SpO_2 and pulse rate data by locating the strongest pulse signal
- evaluate the trend of a patient's perfusion during continuous monitoring
- document peripheral circulation
- assess collateral flow prior to arterial catheterization



“How is PI_r measured?”

- Perfusion Index (PI_r) is derived from arithmetical calculations within the pulse oximeter
- Datex-Ohmeda oximeters measure a PI_r range from 0-10
- most patients have a PI_r value of ≥ 0.7
- PI_r is not saturation-dependent, as is the % mod measurement

“What does the numeric value mean?”

- the greater the number, the greater the level of blood flow at the sensor site
- the highest PI_r numeric value indicates the optimal site for the sensor to measure data

“Does everyone have the same PI_r value?”

- No, PI_r is a relative value which means that each patient's perfusion index is unique to them.

For example, a patient with decreased perfusion (due to vasoconstriction) may have a PI_r of 0.8. This value then represents this particular patient's typical perfusion. In contrast, another patient with excellent tissue perfusion may have a typical PI_r of 3.5. In each case, the patient's PI_r value is considered *normal* for them and therefore relative to that particular patient. It would not be accurate to compare the PI_r value from one patient to another.



“How can I quickly locate the optimal sensor site using PI_r ?”

1. Activate the PI_r feature on the oximeter.
2. Apply the appropriate pulse oximetry sensor.**
3. Wait 30-60 seconds before documenting the initial PI_r reading in order to allow the body hemodynamics and PI_r signal to stabilize.
4. Simply check the PI_r value for increase or decrease.
5. Move the sensor to other sites to compare the PI_r values in order to locate the site with the strongest pulsatility (the site with the highest PI_r value).



NOTE: When comparing different sensor sites on a patient, it is important to record and refer to the typical PI_r value for that individual. For instance, if it is normally high (>1.5 for instance), then a PI_r value of 0.09 would be indicative of low perfusion at that specific sensor site.

** Adhesive sensors are recommended for patients that will experience high-motion conditions. These high-motion conditions have been shown to affect the sensor's ability to read data. PI_r is not accurate during motion. Following the motion episode, allow the digit to return to baseline, approximately 60-90 seconds.

PI_r is used for other clinical applications

Perfusion at the sensor site can be trended when clinicians use PI_r



For example, the PI_r value may be 1.2 when a patient is first placed on the SpO_2 monitor. Over a 4-hour period, the PI_r may decrease in value to 0.6. The attending clinician should then assess the patient to find the cause of decrease in the patient's perfusion, i.e., displaced sensor, digit restriction, etc. After assessing the cause of the decrease in PI_r value, the clinician may then decide to alter care for the patient or simply reposition the sensor if it has been displaced or improperly applied.

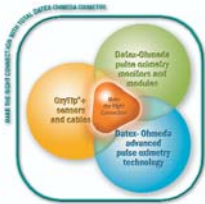
Bedside assessment of the peripheral circulation is no longer subjective when clinicians use PI_r



- The Modified Allen's Test may fail to adequately assess ulnar artery perfusion to the hand in many situations.
 - The Allen's test is not quantifiable and has significant variability.
- PI_r provides additional, easy-to-read, quantifiable information that directly correlates to flow quantification traditionally documented by digital volume plethysmography. The PI_r comparison provides a form of flow quantification and medical legal documentation.

For simple steps on how to perform the Allen's test and perfusion index study, review the publication by Wolff C, et al. The Radial Artery: An Exciting Alternative Conduit in Coronary Artery Bypass Surgery. Critical Care Nurse. 1997;17(5):34-39.

Make the Right Connection with Total Datex-Ohmeda Oximetry



We ensure your confidence by delivering optimum oximetry performance when Datex-Ohmeda equipment, advanced technology, and original OxyTip[®]+ sensors and cables are used together. Only Datex-Ohmeda OxyTip+ sensors can be used with TruTrak[®]+ enhanced monitors and the TuffSat[®] PI_r[®] oximeter. Refer to the monitor's User manual for more information.

- * It is important to remember that PI_r is not an indication of cardiac output. Also, it is important to note that perfusion to the extremities is not a smooth, stable condition; it continually fluctuates and this can be seen using PI_r, making it a dynamic parameter (like ECG). At rest, a normal person's PI_r can fluctuate as much as 0.07 (7%) or more. In addition, sudden internal (pathological) or external (clinical setting) stresses can cause rapid wide variations in the peripheral circulation, which is also reflected in the PI_r. The important point to remember is that all factors, including underlying pathology should be taken into consideration when interpreting PI_r values. It should not be used in isolation from clinical information and judgment.

For additional reading on this clinical tool, please visit
www.datex-ohmeda.com/products/monitoring_3800po.htm



Datex-Ohmeda Division • Instrumentarium Corp.
P.O. Box 900, FIN-00031 Datex-Ohmeda, Finland
Tel. +358 1039411 • Fax +358 9 146 3310

www.datex-ohmeda.com

Datex-Ohmeda, Inc.
P.O. Box 7550, Madison, WI 53707-7550, USA
Tel. 800 345 2700 • Fax 608 221 4384

www.us.datex-ohmeda.com