

Importance of Five Critical Vital Metrics in Preventative Medicine

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When assessing basic bodily functions, healthcare providers assess body temperature, blood pressure, heart rate, or pulse, and respiratory rate using tools that directly and indirectly provide the relevant measurements.^{1,2} Five crucial measurements are: 1) core temperature, 2) blood pressure, 3) electrocardiogram, 4) photoplethysmography, and 5) pulmonary plethysmography. With the combination of these measurements comes a comprehensive profile of a person's physiology. Specifically, these techniques provide information about heart rate, heart rhythms, heart and lung function, as well as information about oxygen content in the blood. This information provides physicians and patients with a basic understanding of the current function of the body's vital organs.

Each of the five measurements mentioned above provides essential information about the current health of the patient. For example, raised temperatures occur in response to heightened immunological activity and can therefore indicate infection or inflammation.³ Blood pressure results from the heart's pumping action.⁴⁻⁶ Blood pressure results from several variables including blood volume, resistance of blood vessels, and blood viscosity or thickness, and variations in blood pressure can therefore occur for a number of reasons. However, one consistent variation is known: high blood pressure, or

hypertension, is often associated with cardiovascular problems.⁷ Electrocardiograms provide an opportunity to noninvasively interpret electrical activity in the heart and are thus particularly useful for patients with cardiovascular symptoms or high risk of coronary heart disease.⁸ This technique can help identify cardiovascular dysfunction, including heart attacks and pulmonary embolisms.^{9,10} Photoplethysmography provides information about heart rate, the cardiac cycle, and respiration,¹¹ whereas pulmonary plethysmography provides specific information about lung capacity.¹² Respiratory rate may provide some information about respiratory function,¹³ but it is more useful in indicating acidotic states because expiration removes carbon dioxide, a byproduct of acidosis. It is therefore also often measured during a vitals assessment.

Though there are several published statistics on the average numbers associated with each of the measurements used to assess vitals, the application of those statistics to individual patients can lead to inaccurate interpretations. It is generally more important that an individual's vitals stay consistent than that they adhere to population averages.¹⁴ Several factors independent of physiological state, such as posture during the taking of measurements, can influence readings.¹⁵ It is thus important that individuals be monitored often so that an accurate idea of their physiological state can be globally obtained. Just as important is the personalization of healthcare, as similar vital measurements can justify separate diagnoses and treatment regimens in different patients.¹⁶ Additionally, personalization allows for the integration of patients' risk factors and preferences. Current technologies, that allow for

regular monitoring of patients' vitals make personalized care truly feasible.^{4,16-24}

The DynoSense Corp technology is at the forefront of efforts to monitor health and personalize medicine. Their tool, the Dynosensor or Dyno for short, provides a simple and reliable way to obtain all five critical physiological measurements at once and as often as recommended by healthcare providers. The Dyno provides benefits not offered by other medical monitoring technologies. Specifically, it is small, noninvasive, intuitive to use, and versatile, allowing for medical tests outside the scope of basic vitals. This versatility makes the Dyno an ideal tool for personalized medicine. Data from the device is securely collected and available for patients to share at their discretion with, for example, their physicians. The collected data provides information that cannot be obtained during a visit to the physician and can therefore facilitate personalization of patients' treatment plans. The Dyno is amenable to easy use and does not pose health risks, nor is it conducive to adverse side effects. It takes measurements in less than a minute with the simple placement of a wand in the patient's mouth, and it sanitizes itself between uses. The Dynosensor can provide feedback on vital signs as often as healthcare providers deem necessary, and, as vitals are not continuously measured, the Dynosensor does not require high power batteries or high levels of energy consumption.

About Sponsor: DynoSense Corp. is a medical device company and creator of world's first fully integrated multi-scan health scanner.

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