CLAIMS

1. A multifunctional measuring device capable of determining carotid blood pressure, comprising:

a heartbeat sensing unit to be disposed on a subject's chest in order to obtain heartbeat signals, wherein the heartbeat sensing unit is an acoustic wave sensor;

a pulse sensing unit to be disposed on the subject's neck at a position corresponding to the subject's carotid arteries in order to obtain pulse signals, wherein the pulse sensing unit includes an adhesive patch with a thyroid cartilage locating portion, by aligning the thyroid cartilage locating portion with a subject's thyroid cartilage, the pulse sensing unit is attached to the subject's neck at a position corresponding to the left or right common carotid artery; and

a data calculation unit configured to communicate with the heartbeat sensing unit and the pulse sensing unit and to process signals coming from the heartbeat sensing unit and from the pulse sensing unit;

wherein the data calculation unit obtains a mean arterial pressure of the subject's carotid arteries by calculating with the heartbeat signals coming from the heartbeat sensing unit and the pulse signals coming from the pulse sensing unit.

2. The multifunctional measuring device of claim 1, wherein the heartbeat sensing unit is configured to be disposed on a subject's chest at a position corresponding to the vicinity of the aortic valve, the pulmonary valve, the mitral valve, or the tricuspid valve.

3. The multifunctional measuring device of claim 1, wherein the pulse sensing unit is a Doppler radar, a piezoelectric sensor, a piezoresistive pressure sensor, a capacitive pressure sensor, an acoustic wave sensor, an ultrasound sensor, or a photoplethysmographic (PPG) sensor.

4. The multifunctional measuring device of claim 3, wherein the pulse sensing unit includes the adhesive patch with the thyroid cartilage locating portion configured to be disposed at a pulse measuring point on the subject's neck, wherein the pulse measuring point is a point in a line segment defined as follows: the line segment starts from a starting point (or 0 cm position) defined as a point that is to the left or right of, and horizontally spaced apart by 3±0.3 cm from, the peak of the thyroid cartilage, and the line segment extends from the starting point (or 0 cm position) for 4 cm along a direction that extends distally at an angle of 135 degrees with respect to the horizontal direction.

5. The multifunctional measuring device of claim 4, wherein the mean arterial pressure is obtained through the following equation (I) or equation (II):

mean arterial pressure (MAP) = $a\left(\frac{l_p}{t_{pa}} \times c\right) + b$…… equation (I);

mean arterial pressure (MAP) = $A\left(\frac{l_p}{t_{pa}} \times C\right)^2 + B$…… equation (II);

where l_p is the length of the path along which the pulse propagates through the arteries between the aortic valve and the pulse measuring point; t_{pa} is the times it takes for a pulse to reach the pulse measuring point from the aortic valve; and a, b, c, A, B, and C are correction parameters.

6. The multifunctional measuring device of claim 5, wherein the multifunctional measuring device further comprises a communication module connected to the data calculation unit, wherein the communication module is a Bluetooth communication module, a WIFI communication module, a radio frequency identification (RFID) communication module, a near-field communication (NFC) module, a Zigbee communication module, or a wireless local area network (WLAN) communication module.

7. The multifunctional measuring device of claim 6, wherein the data calculation unit is provided in the heartbeat sensing unit, the pulse sensing unit, and/or a portable device.

8. The multifunctional measuring device of any one of claims 1 to 7, wherein the multifunctional measuring device is configured to obtain heart sound, blood flow sound, pulse wave velocity, and the degree of carotid stenosis.