What is the vascular condition of your patients?

The vessel walls become stiffer as a result of the natural aging process. A lifestyle characterized by **risk factors** (smoking, obesity, stress, diabetes, lack of exercise, etc.) exposes the vessels to atherosclerotic processes at an early stage, which can accelerate the **stiffening of the vessels** (EVA - Early Vascular Aging). If the elasticity of the vessel walls decreases, the pulse waves ejected by the heart are no longer sufficiently damped. These pulses can thus continue into the microcirculation and cause **end organ damage** such as **strokes or heart attacks**. The PHYSIO-PORT AS supports the prevention of **cardiovascular events** by detecting premature aging of the vessels at an early stage through regular patient screening.
The following determined and validated parameters are suitable for estimating vascular elasticity:

- ✓ *central blood pressure (cBP)*
- ✓ *pulse wave velocity (PWV)*

This allows you, the physician, to determine the patient-specific cardiovascular condition and expand your diagnostic capabilities.

Figure 1: PHYSIO-PORT AS

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Flyer - PHYSIO-PORT AS - ENG - Doc.-Rev. D

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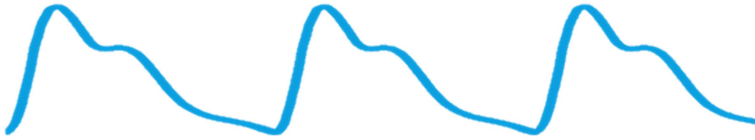
[6] Cover illustration based on: Medicine doctor hand working with modern computer interface as medical concept. From ESB Professional. www.shutterstock.com. royalty free stock photo number: 133503068



PHYSIO-PORT AS

Blood pressure measurement and determination of vascular stiffness parameters

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Your advantages with the PHYSIO-PORT AS

Patient advantages:

- ✔ ***Fast and painless:*** short measurement duration and reduced pressure load thanks to upward measurement method
- ✔ ***Safe:*** non-invasive determination of relevant central vascular parameters using the oscillometric measurement principle
- ✔ ***Portable:*** ambulatory blood pressure measurement device for clinic and home environment

Medical advantages:

- ✔ **Single-Device-Solution:** for peripheral and central blood pressure, pulse waveform as well as pulse wave velocity
- ✔ ***Reproducibility:*** user-independent measurement results
- ✔ ***Daily profile:*** recording of all parameters over a 24 h period with an adjustable interval
- ✔ ***Performance:*** proof of measurement accuracy in clinical studies

Economic advantages:

- ✔ ***Invoicing:*** health service covered by health insurers (e.g. GOÄ-No. 648 in Germany)

Choose innovative medical technology and expand the diagnostic capabilities of your practice or clinic with the PHYSIO-PORT AS.

Health made in Germany

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Blood pressure measurement and pulse wave analysis

PHYSIO-PORT AS (AS - Arterial Stiffness) is a **blood pressure measuring device** for long-term measurements (see Figure 1).
It uses the conventional blood pressure measurement with the deflation measurement technique (DMT) as well as the innovative inflation measurement technique (IMT), which reduces the duration of a single measurement to a minimum and significantly increases patient comfort by reducing the pressure load on the arm.

The following blood pressure parameters on the upper arm are determined:

- ✔ *systolic blood pressure (SYS)*
- ✔ *diastolic blood pressure (DIA)*
- ✔ *mean arterial pressure (MAP)*
- ✔ *heart rate (HR)*

Procedure and diagnostic added value of pulse wave analysis:

To measure the **parameters of arterial vascular stiffness**, the cuff pressure is held for 15 seconds following the blood pressure measurement. During this period, the blood pressure curve is recorded for pulse wave analysis.

After that, the central pulse wave is reconstructed and the central blood pressure is determined. Due to the different blood pressure phenotypes, there is no linear relationship between central blood pressure and upper arm blood pressure [2]. High central blood pressure is associated with higher cardiovascular risk [3].

As a result of contraction of the left ventricle, a primary pressure wave propagates through the arterial vascular tree.

Blood pressure measurement and pulse wave analysis

The velocity of this wave is called the **pulse wave velocity (PWV)**. The wave is reflected in peripheral vessels and the reflected wave components return to the heart. With increasing vascular stiffness, the PWV increases. Due to the resulting earlier pulse wave reflection, the shape of the pulse wave and the **central blood pressure** change. The pulse pressure (PP) at the heart (cardiac load) increases and at the same time the oxygen supply to the heart deteriorates. A measure of this is the **augmentation (AugP)** shown in Figure 2.

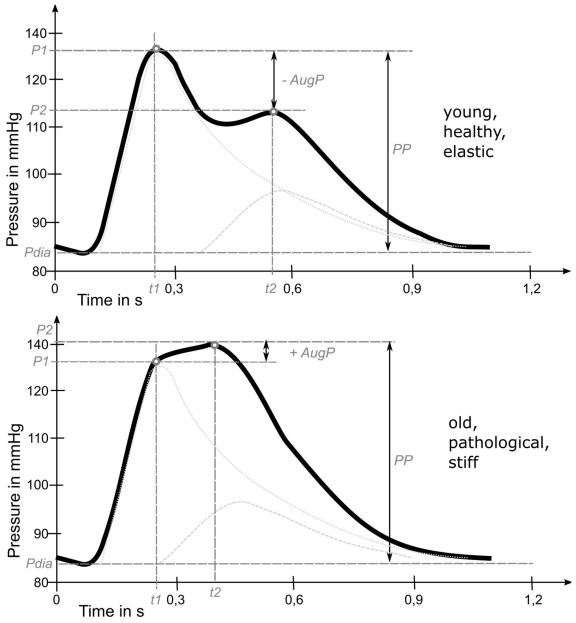

Figure 2: Relationship between vascular elasticity and pulse waveform (figure in accordance with source [4])

A 1 m/s increase in PWV is associated with a 19% higher cardiovascular risk and cardiovascular mortality [5].
An additional therapeutic objective besides hypertension treatment should therefore be the reduction of central blood pressure and PWV.