Is it possible to measure the risk of heart attack?

The classical method of measuring a patient's risk of heart attack is catheterization. The basic errors and miscalculations associated with this method are discussed in detail in Section 3. **On the other hand, the PNS control defect can be measured very precisely. The risk of heart attack as the result of such a defect can be estimated.**

PNS activity can be measured. The method used is called: "Heart Frequency Variability" ("HRV"). An instrument with specialized software can be used to make a 2-5 minute recording of your heart beat or pulse to determine the level of your PNS activity. For comparison, it is best if such examinations are carried out under near to similar conditions, when the patient is lying down and breathing calmly. More extensive data are obtained by "HRV" measurements from a long-term ECG, whereby the evaluation program must contain the "HRV analysis", which is not the case in all instruments.

"HRV analysis"

What is "heart frequency variability"? Our pulse, which expresses our heart frequency, is never completely regular. From beat to beat there are variations of milliseconds. There is a system to these irregularities. Different body rhythms vary the tact. One of the main sources is the breathing rhythm: breathing in speeds up the pulse, breathing out slows the pulse. This rhythm is regulated solely by the PNS. The stronger the control function of the PNS on the heart, the greater the difference in the pulse between breathing in and breathing out. The first graph in Section 4 ("How do heart attacks develop") is a good illustrative example of this.

There are other body rhythms such as the day-night rhythm that affect variations in the pulse rate. With the aid of certain mathematical methods, it is possible to precisely determine the level of PNS activity. SNS activity can, on the other hand, only be approximately assessed by this method.

Parameter

Parameter	Wert	Einheit
Herzschläge berechnet aus	Pulswelle	
-> Herzfrequenz basierte Parameter		
Mittlere HF	64,04	1/min.
St.Dev.	3,84	1/min.
Variationskoeffizient (HF)	5,99	%
-> RR-Abstand basierte Parameter		
Mittlerer RR-Abstand	940,23	ms
SDNN	56,13	ms
PNN50	49,21	%
Variationskoeffizient (RR)	5,97	%
RMSSD	75,32	ms
SD1	53,26	ms
SD2	58,87	ms
Stressindex	81,97	Pkt.
-> Parameter aus der Spektralanalyse		
HF-Band	0,150 - 0,400	Hz
LF-Band	0,040 - 0,150	Hz
VLF-Band	0,003 - 0,040	Hz
Power HF-Band	434,20	ms²
Power LF-Band	152,33	ms²
Power VLF-Band	166,09	ms²
Power Total	752,62	ms²
Rel. Power HF-Band	57,69	%
Rel. Power LF-Band	20,24	%
Rel. Power VLF-Band	22,07	%
LF/HF Ratio	0,3508	
Rhythmisierungsgrad	3,17	
-> Sonstige Parameter		
Biol. HRV-Alter (Kurzzeit-HRV)	44	Jahre

Histogramm

Poincaré Plot

FFT Spektrum
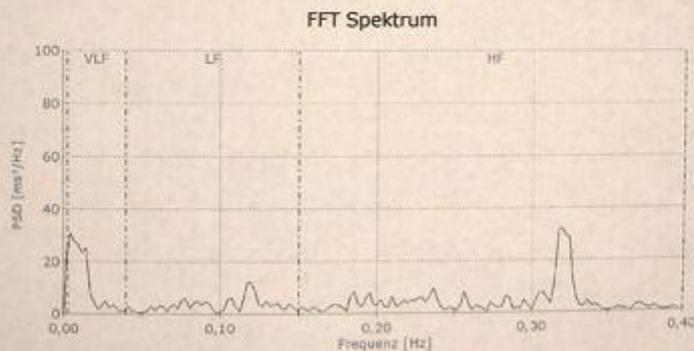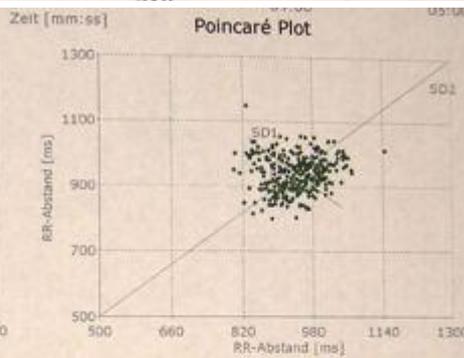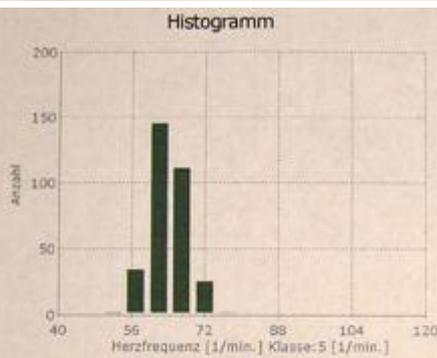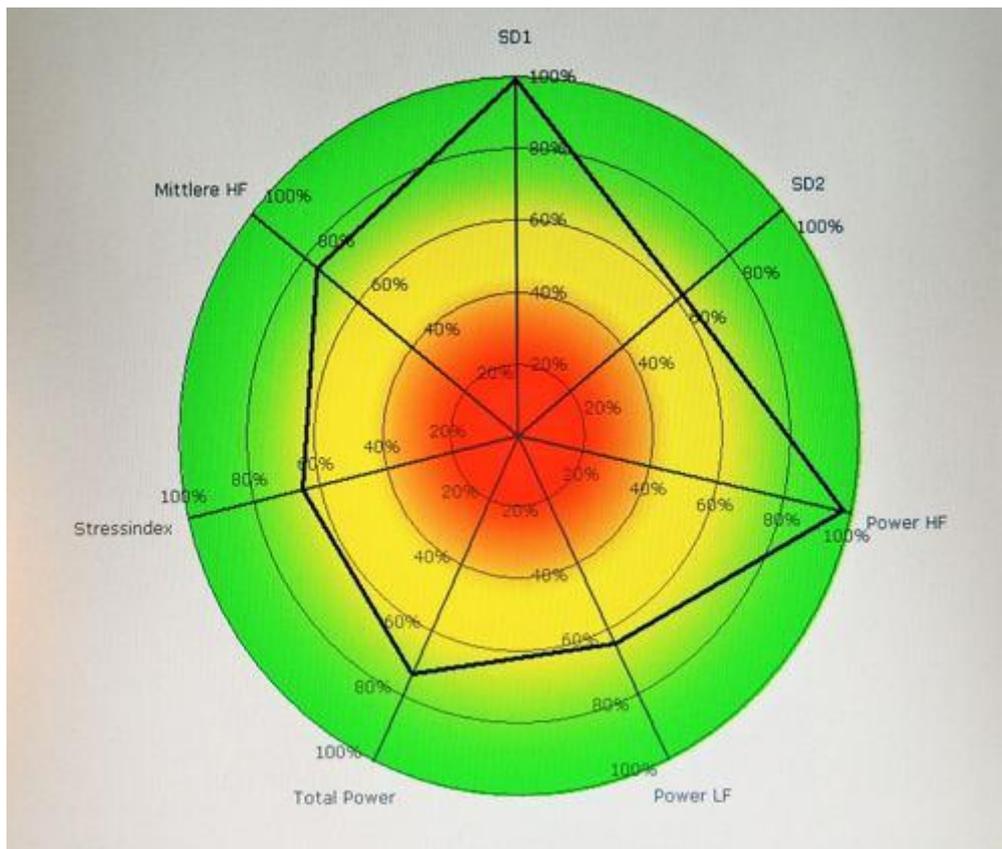
Numerous studies have shown that **there is a close connection between the extent of PNS reduction during the first two weeks following a heart attack and the fate of the patient.** The greater the defect in the PNS in the first few days after an acute heart attack, the worse the patient's chances of survival and the greater the risk of dying of a heart attack or rhythm disorder in the following years. Detailed information on the subject of HRV and heart disease can be found in my book "Herzinfarkt vermeiden" (11).

There are also very interesting data on the phase of a threatening heart attack. The work group of M. Malik and J. Camm, the two leading international "HRV" experts from St. Georges' Hospital in London, published the following study (93). The "HRV" was determined in a 24-hour ECG in three groups: one group with "unstable angina", another with acute heart attacks, and a healthy control group, each of about 50 patients. "Unstable angina" was defined as spontaneous heart pain developing out of a state of rest, a situation that is known to lead to heart attacks. In "HRV" analysis the patients with unstable angina and those with heart attacks showed a similar severe reduction in their "HRV" in contrast to the control group.

The following day, the "HRV" of the patients with unstable angina was again determined from a further long-term ECG. In a proportion of these patients the HRV markers were considerably better, meaning that the PNS activity had recovered. These patients were in a clinically better condition; their ECG signs improved and they were again free of complaints. The HRV markers of the other patients in this group, who still suffered from heart pain and ECG signs, which indicate a threatening heart attack, were still reduced, and were on average lower than on the first day. The PNS blockade had not been released. Even during this phase of a threatening heart attack, the "HRV" proved to be a sensitive indicator of heart risk.

Two large epidemiological studies are very interesting in this respect: **in a 2-minute recording, the "HRV" of persons with absolutely healthy hearts was determined** and their personal development was followed over the next years. The probability that these persons would have, or die from a heart attack in the following years correlated to a great degree with the previously recorded PNS level. **The clearer the PNS deficit in this previous short recording, the greater the risk of heart attack in the following years (94,95).**

The strength, energy and youth of the PNS are not a permanent condition. Age gnaws and those that sit around a lot lose the power of the PNS. Similarly, weakness and blockade of the PNS is also not a natural permanent condition. Heart patients that do a lot for themselves, as described in the previous section, can aid the regeneration of their PNS. **Weakness of the PNS is not a fate that has to be endured, but a challenge to work on oneself.**

Oxidative stress can also be measured by specialists. However, you will not be wrong if you assume that like most of the population in the industrialized world, your burden of oxidative stress is not low. The decisive consequence is to adopt a diet that provides good protection against oxidation.