Dr. **Margot Schmitz;**
University Lecturer;
Psychiatrist and Neurologist,
Head of the
"Institute of Psychosomatic
Medicine" in Vienna.
Research:
Private Medical University,
Salzburg, Paracelsus University

5 Case studies
with clue und clue medical

Telozo GmbH
Office Park I,
Top 4
A 1300 Vienna / Airport

Tel.: +43 (0)1- 7007 32551
Fax: +43 (0)1- 7007 32559
Internet: http://www.cluemedical.com
eMail: office@telozo.com

The great thing about clue

clue is smart. **clue** is fast. **clue** is small. It fits in any trouser pocket and within just a few minutes it provides objective data about cardiac function, the balance of the vegetative nervous system and mental stresses which are often falsely interpreted to be an organic illness.

Anyone can perform the measurement by himself. Hold the device against your chest for two minutes. **clue** detects an ECG, heart rate variability (HRV) and shows the activity of the autonomic nervous system (sympathetic and parasympathetic regulation). With this data, you can avoid misunderstanding body signals and getting scared unnecessarily.

HRV can be analysed in several frequency ranges and provides information about the vegetative nervous system. Lower frequencies indicate stress – any type of excitement, tension, anxiety. In the vegetative nervous system this is the activity of the sympathetic nervous system. High frequencies show how much the vegetative nervous system counter-regulates and takes care of relaxation and recovery. The parasympathetic nervous system is in charge of that. **clue** shows when the balance is off.

clue is available in two versions. The simple version just shows you if you are "in the clear" in terms of the vegetative nervous system and can deal well with strains. You get the corresponding image quickly on your mobile or PC/notebook. To do this, all you have to do is connect **clue** to a computer with a simple plug. Each household device is to be programmed so that that your computer handles everything else itself. It sends the data to a central computer which evaluates them and translates the information into an easy to read graphic. At the same time, more extensive data can be sent to a doctor of your choice who can immediately make a more precise diagnosis.

The more complex version of **clue**, **clue medical** - the professional statement – records activity in the vegetative nervous system from heart rate variability and translates the data from the sympathetic and parasympathetic nervous system into surface integrals and supplies a graphic thereof. From the graphic one can determine how significant mental strain is and how well or poorly it can be handled. At the same time, the **clue** measurements show whether the heart is working regularly or whether treatment by a specialist is advised. The whole thing takes just a few minutes with the immediate option of contacting a doctor from anywhere you have access to the Internet.

Case studies

1. **Panic Attacks**
2. **Generalized Anxiety Disorder**
3. **Depression**
4. **Victim of Workplace Harassment**
5. **Burnout**

Telozo GmbH
Office Park I,
Top 4
A 1300 Vienna / Airport

Tel.: +43 (0)1- 7007 32551
Fax: +43 (0)1- 7007 32559
Internet: http://www.cluemedical.com
eMail: office@telozo.com

1. Panic Attacks

In the middle of the night, Erika H. wakes up with a sharp pain in her heart and l aboured breathing. She has a lump in her throat, she gags and gets dizzy. She fears for her life and has the feeling she's going crazy.

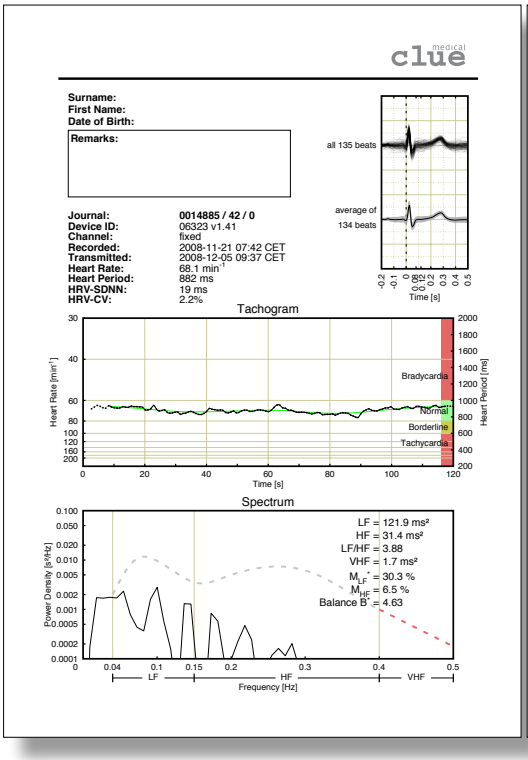
In her panic, she has already called emergency medical services eight times, eight times in the last two months. The ambulance raced her to the emergency room at the closest hospital, the doctors check her heart and kidneys - and each time they determine: Organically, there is nothing wrong at all with Erika H. Her ECG is completely normal. The 24 hour recording also merely shows that everything is fine with her heart.
Sometimes she thinks that she can feel another such attack coming on days in advance. Yet even then, the ECG doesn't show any abnormality. Erika H. on the other hand feels quite differently - strained, attacked, threatened.

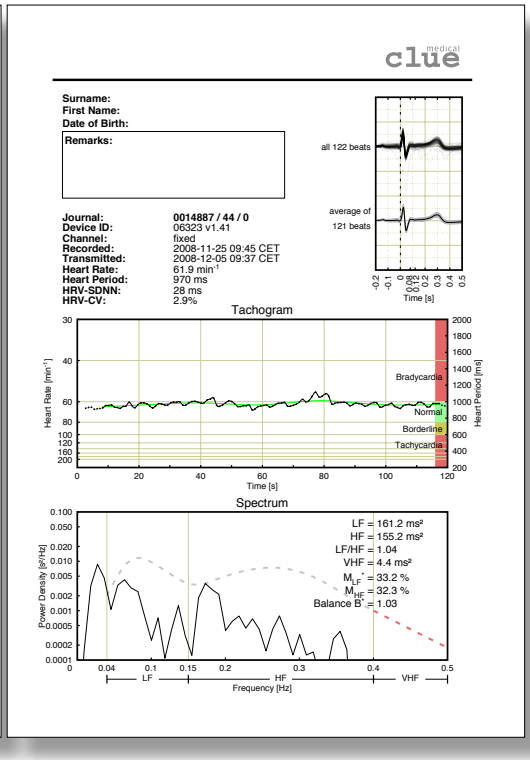
What is happening to her physically and mentally can not be properly read by the electrocardiogram. But, **clue** can do it. The device shows that her vegetative nervous system has come unbalanced but her heart is healthy

For Mrs. H. this feedback has a very healing effect: She sees when she gets anxious that organically, everything is fine. As a result, her anxiety decreases. She stops making herself crazy. She no longer gets panic attacks. Mrs. H. works with a coach on a stress management programme. Since then she's been doing even better.

Left figure:
It shows a normal heart rate and a normal yet sympathetically more active balance (4.63)

Right figure:
The lower heart rate and lower balance (1.03) indicates relaxation.





Telozo GmbH
Office Park I,
Top 4
A 1300 Vienna / Airport

Tel.: +43 (0)1- 7007 32551
Fax: +43 (0)1- 7007 32559
Internet: http://www.cluemedical.com
eMail: office@telozo.com

2. Generalized Anxiety Disorder

Peter L is an athletic type. Tall, slim, in peak condition. Occupation: Pilot. L's "dream job". His ECG shows something odd (that doctors refer to as „right bundle branch block"). The cardiologists assure L., after having performed several exercise ECG's, that this is no cause for concern. Yet, this disturbs him greatly. He's worried that these are just the initials signs of a soon to be dramatically progressing heart condition. L. is afraid that then he won't be allowed to fly anymore. This idea increases his anxiety further.

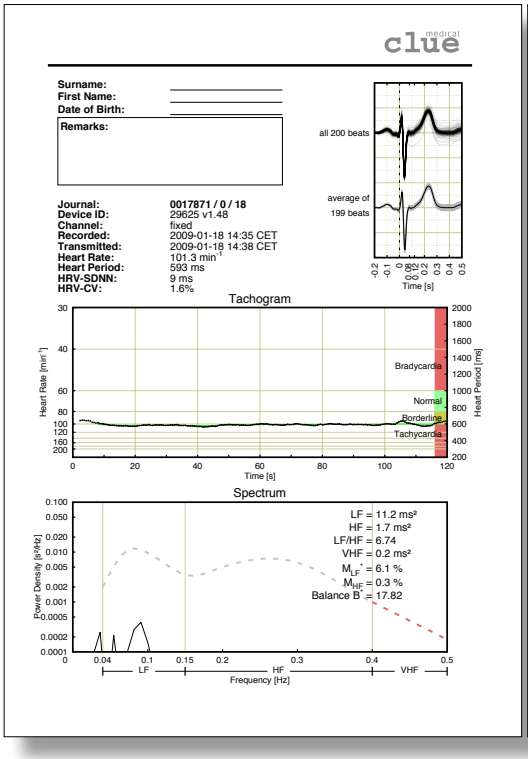
With **clue**, he can calm down. Whenever he thinks that his heartbeat is threatening to become dangerously irregular, he holds the device against his chest for two minutes and sees in the subsequent data evaluation: The sympathetic nervous system is hyperactive in the vegetative nervous system; the parasympathetic nervous system isn't able to relax him. But his heart is fine.

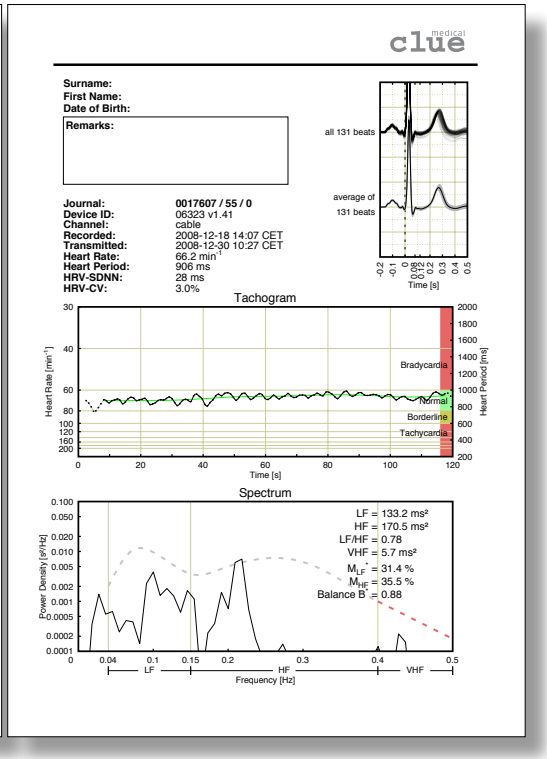
As a pilot, L. is used to trusting high-tech instruments.
clue provides him with the reports he needs to remain calm.

So, L. doesn't need to worry about a heart condition. There is no indication whatsoever of one. L. is well advised to relax – through deep abdominal breathing, a technique which can be learned involving short muscle contractions which lead to relaxation ("Jakobson method"), through meditation, St. John's wort tea, biofeedback and mental coaching.

Left figure:
Clear hyperactivity of the sympathetic nervous system, Balance 17.82

Right figure:
Very relaxed situation, low sympathetic nervous system activity, Balance 0.88





Telozo GmbH
Office Park I,
Top 4
A 1300 Vienna / Airport

Tel.: +43 (0)1- 7007 32551
Fax: +43 (0)1- 7007 32559
Internet: http://www.cluemedical.com
eMail: office@telozo.com

3. Depression

Karla W. is desperate. Life doesn't make sense for her anymore. She can no longer get up the energy to do anything. Nothing is fun for her. Everything is just effort. It's not worth it, she thinks. She has a doctor prescribe a medication for depression. It can take two to three weeks before anti-depressants can alleviate the depressive mood.
With **clue** however, Mrs. W can tell even before as the medication starts to work

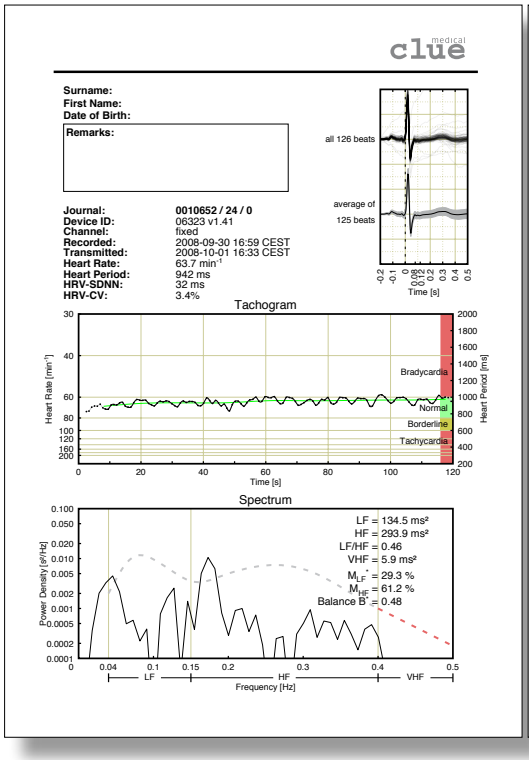
clue shows someone who has slid into a depression that HRV is low and the activity of the sympathetic nervous system is high in the vegetative nervous system. However, anti-depressants reduce – within approx. 48 hours – the activity of the sympathetic nervous system. The medication shows – long before the immediate anti-depressive effect is consciously felt - that things are looking up

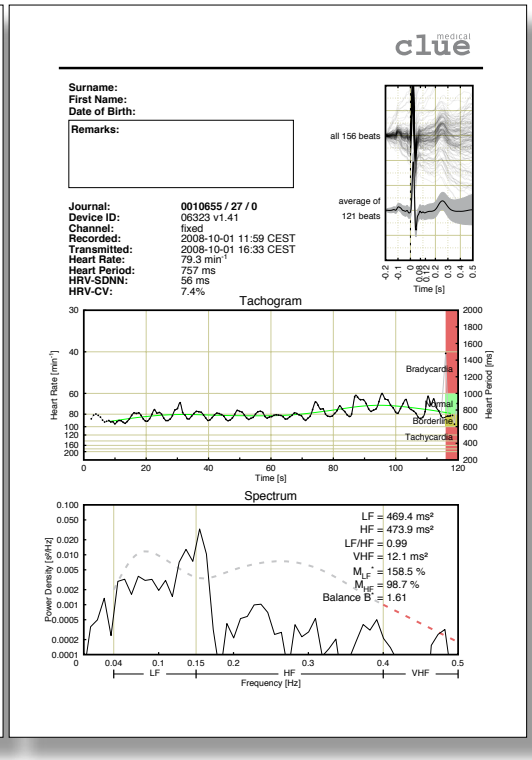
clue can thus determine early on how effective a certain medication is, whether the initial prescription is working optimally right away or if it is advisable to choose another product. The data about a positive effect on the sympathetic nervous system lead to an additionally reinforcing effect: namely, the positive feedback improves the mood and hastens the path out of depression.

clue helps people susceptible to depression to act pre-emptively.
If clue measurements show that the activity of the sympathetic nervous system is increasing, this can be seen as indicative of an impending depression.
Specialists can then, if they feel it is required, recommend a medication before the depressive mood drop fully takes hold. Taken in a timely manner, medication protects against pain: it slows depressions down and shortens the phases of mental despondency

Left Figure:
Positive response through indication of relaxation in the measurement

Right figure:
Signs of relaxation can be seen in heart rate, variability and balance





Telozo GmbH
Office Park I,
Top 4
A 1300 Vienna / Airport

Tel.: +43 (0)1- 7007 32551
Fax: +43 (0)1- 7007 32559
Internet: http://www.cluemedical.com
eMail: office@telozo.com

4. Victim of Workplace Harassment

Manuela T. already has stomach cramps when she goes to the office. In the course of the day, she often gets headaches too. She is tense, in an ongoing state of alarm.
She is afraid that at any moment her boss will scold her in front of the whole team with acid-tongued remarks. She has the impression that she can't do anything right by him because he is always on the lookout for mistakes that he can blame on her. Manuela T. feels harassed. She's afraid of going to the office, has trouble sleeping, cramps, pain and the internal pressure weigh on her so much that she lacks concentration while working and then actually does make mistakes for which her boss throws her „total ineptness" in her face.

A check with **clue** shows: her heart rate variability is very low, however her stress level is at maximum level. Her vegetative nervous system is completely out of balance. Her sympathetic nervous system is acting crazy.

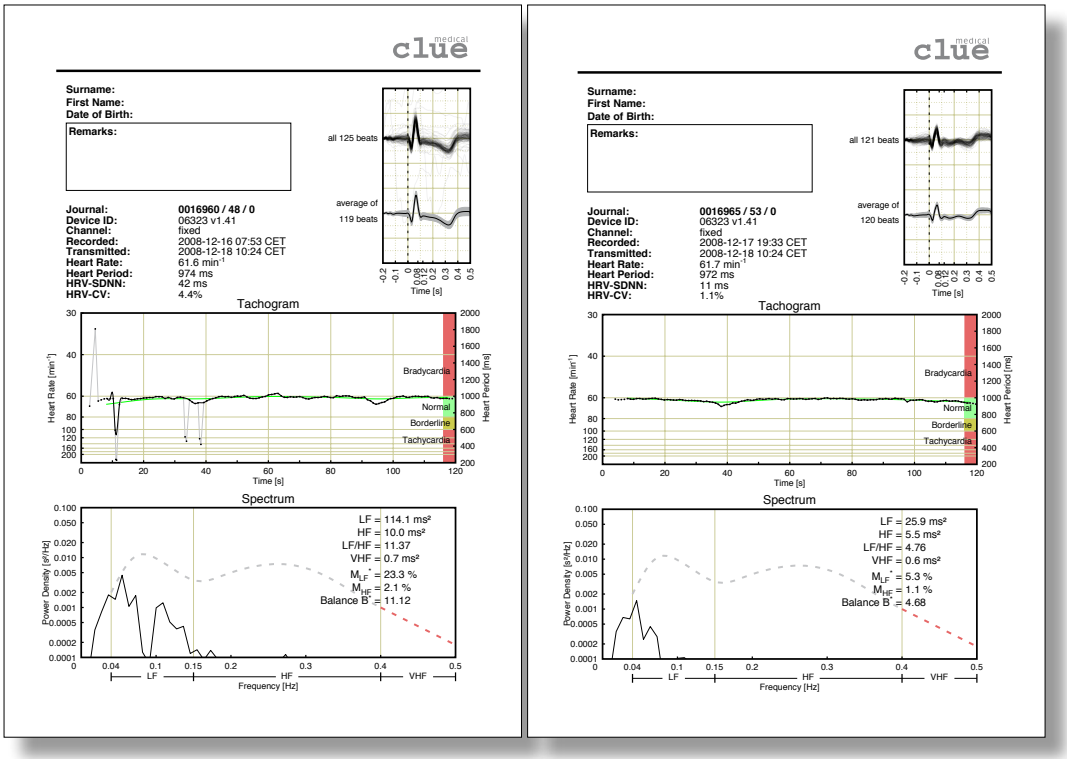
Organic disturbances, also shown by **clue** measurements, are absent, however.

An effective help programme can be developed for Mrs. T. with the **clue** data: a properly dosed medication adjusted specifically for her to get her back into a recuperative sleep rhythm and better balance the vegetative nervous system. This causes her heart rate variability to rise. Mrs. T. is better able to keep stress at bay and better recuperate with relaxation exercises. With coaching she learns how not to fall so easily into the traps set for her by her boss. Three weeks later she feels considerably better, her physical symptoms have disappeared and she handles her tasks on the job such that she doesn't leave herself unnecessarily open to attacks. She no longer feels trapped in her current job. She has once again acquired a sense of what she is capable.
She has become more secure and more self-confident.

She's on the lookout for alternatives and is confident that they will come up for her.

Left Figure:
high stress level despite low rate

Right figure:
Stress is lower, but decreased variability is a sign of the ongoing problem



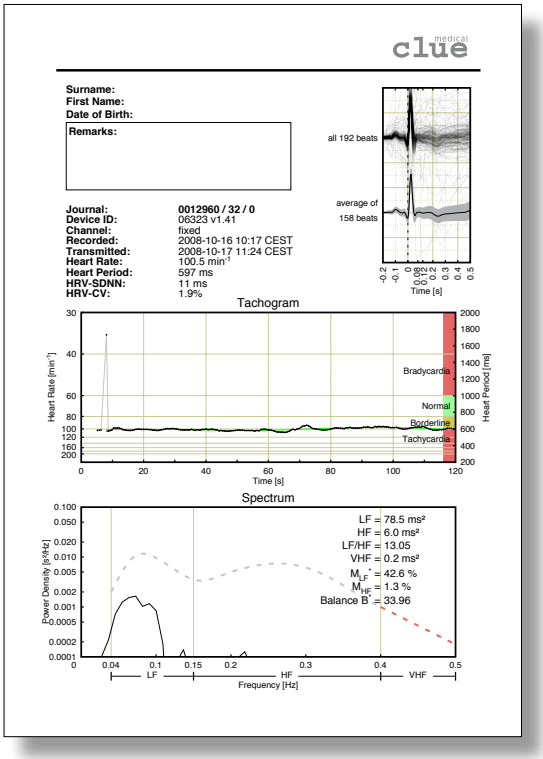
Telozo GmbH
Office Park I,
Top 4
A 1300 Vienna / Airport

Tel.: +43 (0)1- 7007 32551
Fax: +43 (0)1- 7007 32559
Internet: http://www.cluemedical.com
eMail: office@telozo.com

5. Burnout

Suddenly, everything failed. Helmut A. simply fell over. A stroke. At the age of 50. Helmut A had not shown any consideration for himself. At his job, he was always willing to take on additional projects and he demanded of himself that he always did everything perfectly. He always had several tasks to accomplish at once. A. was no longer able to "shut off". He was under tremendous strain and there came a point where he no longer realised under just how much pressure he was. He though this state was normal and it didn't occur to him that he needed to fix something about the situation.

Above figure:
Very strong sympathetic nervous system activation (Balance 33.96, decreased HRV 1.9%)



He thus manoeuvred himself right into a burnout.
He is terrified by the thought that the next stroke is sure to happen, at the slightest exertion.

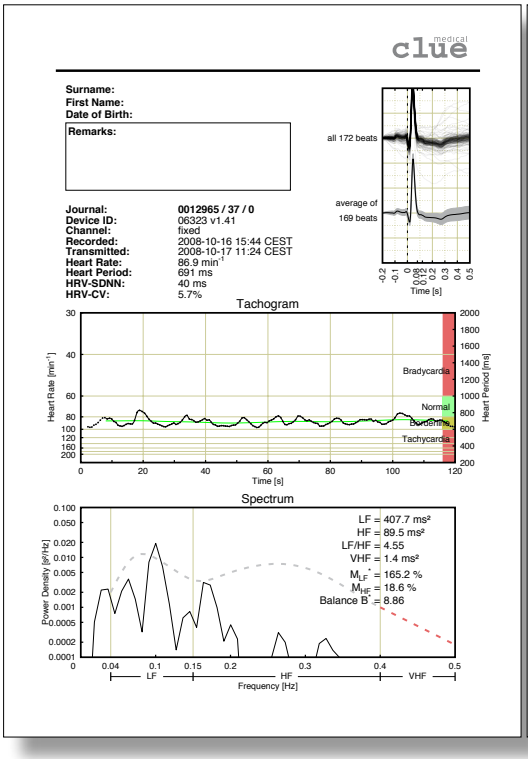
clue can relieve him of this fear.

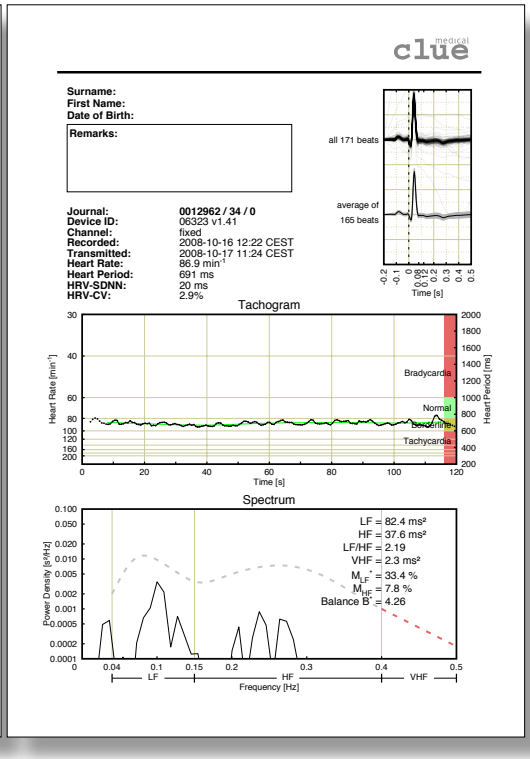
In the burnout treatment, his **clue** data let him know that he is constantly recovering, his vegetative nervous system is functioning in a more balanced fashion and his heart rate variability is once again approaching a healthy level. A. thus becomes more confident, continually reinforced by the positive data about his recovery.
He thus regains his health more quickly. He also knows what he can expect of himself again. And A. now has a tool – namely clue – that will let him know when he needs to be more considerate to himself.
clue can protect people from getting burned out.

A. has understood that there are stress limitations which are more quickly exceeded than he previously thought. Physical signals are often not properly realised or taken seriously. Objective data provide a good orientation. As a result, prevention is considerably easier.

Left figure:
Improved situation, balance already approaching normal 8.86 (normal HRV)

Right figure:
further improvement in balance 4.26 (normal HRV)





Telozo GmbH
Office Park I,
Top 4
A 1300 Vienna / Airport

Tel.: +43 (0)1- 7007 32551
Fax: +43 (0)1- 7007 32559
Internet: http://www.cluemedical.com
eMail: office@telozo.com