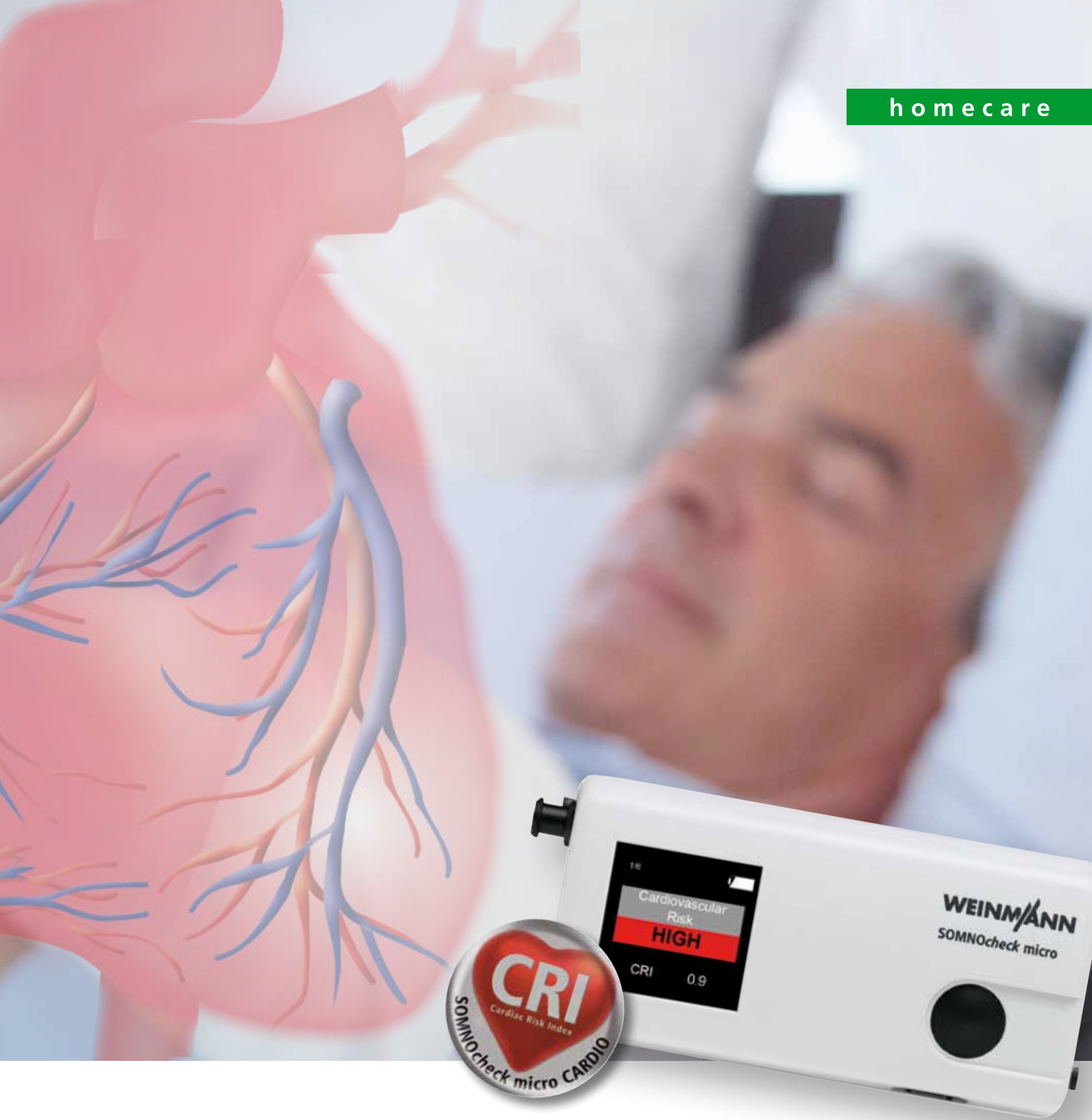


home care



SOMNOcheck micro CARDIO

Simple Assessment of Cardiovascular Risk During Sleep

In sleep medicine – In internal medicine – In preventive medicine



SOMNOcheck micro CARDIO

In sleep diagnostics we provide classic data about apnea, desaturation and arousals.

We also have answers to questions that have long been open.

Which patient most urgently needs treatment?

The Cardiac Risk Index (CRI) is the new severity parameter in sleep diagnostics. It supplements the well-known Apnea Hypopnea Index (AHI) with the cardiovascular risk dimension. So for the first time in an early screening of Sleep-Disordered Breathing (SDB), it is possible to see whether a patient is at risk of developing cardiovascular disease in addition to or as a result of SDB.

Which patient is really at risk?

The very first sleep screening made with SOMNOcheck micro CARDIO identifies patients with elevated cardiovascular risk. Furthermore, special indication is given of two additional risk factors for heart failure: arrhythmia (atrial fibrillation) and Cheyne-Stokes breathing.

Which additional diagnostics lead to the right diagnosis?

The CARDIO fingerprint for each patient shows which secondary or concomitant diseases may lead to an increased cardiovascular risk. This information shows the way to the next diagnostic steps – in or outside sleep medicine.



CARDIO *Simple assessment of cardiovas*

Our innovative measurement method implemented in the diagnostic device SOMNOcheck micro CARDIO works quickly, simply and non-invasively. For the first time a sleep screening device can determine a new severity parameter called "Cardiac Risk Index" (CRI) during a nighttime recording. The CRI supplies information about your patient's cardiovascular risk, existent cardiovascular diseases and potential diagnostic steps.

A complete picture from only one nighttime recording

Conventional methods have shed light on particular aspects of cardiovascular risk, but SOMNOcheck micro CARDIO's measurement method is the first to yield a complete clinical picture with a single nighttime measurement. The Cardiac Risk Index is based on measuring actual changes in the patient, as opposed to calculating probability from statistic based risk scores. The algorithm in SOMNOcheck micro CARDIO has been validated against the risk scores of ESC/ESH.*

SOMNOcheck micro CARDIO also determines classic parameters such as desaturation and arousals and recognizes Sleep-Disordered Breathing, another important risk factor for cardiovascular diseases.

The basis of the analysis is the pulse oximetric measurement of the pulse wave. Changes in blood vessels are likewise detectable in the Pulse Wave Analysis (PWA), as are the responsiveness of the autonomic nervous system and heart rhythm. The same sensor measures oxygen saturation, which provides information about breathing disorders such as sleep apnea or Cheyne-Stokes breathing. By means of the optional nasal cannula, the screening device also detects mild obstructions in the patient's upper airways.



Worn like a wristwatch:
SOMNOcheck micro CARDIO

* Grote L, Sommermeier D, Zou D, Eder, D, N, Hedner J. Oximeter-Based autonomic state indicator algorithm for cardiovascular risk assessment. Chest 2011; 139:253-259



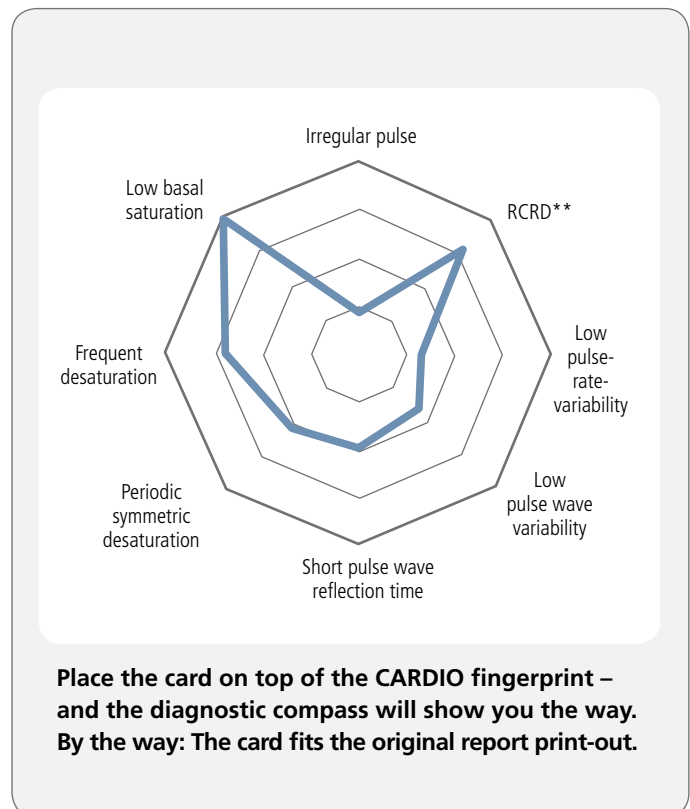
Cardiovascular risk during sleep



Explain increased risk with CARDIO fingerprint

The patient's own manifestations of the individual parameters go into the CARDIO fingerprint. Each parameter indicates certain diseases. The fingerprint serves as a compass, pointing toward the next diagnostic step and suggesting simple prioritization of patients.

- Innovative algorithms assess CRI:
 - Pulse wave amplitude analyses
 - Pulse wave reflection time and pulse rate analysis
 - Oxygen saturation analysis
 - Combined measurement parameters
- Extensive risk status assessment:
 - Indication of endothelial dysfunction
 - Indication of central arterial stiffness
 - Recognition of pattern of diminished responsiveness
 - Detection of arrhythmia (atrial fibrillation)



** RCRD = Reduced Chronotropic Response to Desaturation

Window	Displayed values	Source
Analysis time insufficient If there is no signal from either pulse oximetry sensor or flow sensor for more than two hours.	Analysis time insufficient	Analysis of artefact-free time per signal
Cardiovascular Risk	Low / Moderate / High CRI	Pulse wave analysis
Risk of sleep disorders Shows if patient is at risk of sleep-related breathing disorder	Low / Moderate / High Traffic light display: green, yellow, red	Analysis of results
Check for arrhythmia (AFIB)	Info window appears	Pulse rate analysis
Overview of Respiratory Events Apnea/Hypopnea Index Obstructive Apnea/Hypopnea Index Central Apnea/Hypopnea Index	AHI RDI OAHl ORDl CAHI CRDI	Flow signal: AHI. If this signal contains artefacts, an RDI determined by pulse oximetry and PWA will be displayed.
Check for Cheyne Stokes Breathing	Info window appears	Saturation analysis
Overview of Autonomic Arousals Autonomous Arousal Index Respiratory Autonomous Arousal Index Respiratory Effort Related Arousal Index (autonom)	AAI AAI resp RERAs	Pulse oximetry signal Pulse oximetry signal Pulse oximetry signal and flow signal
Overview of Oxygen Saturation Desaturation index Average Minimum	Drops Average Min	Pulse oximetry signal
Other Snore Average pulse rate Duration of recording	Snore Pulse av. Rec. time	Flow signal Pulse oximetry signal Analysis of artefact-free time
Artefact-free recording time If one of the two signals appears for less than four hours (i. e. several artefacts), a window opens that shows how long which signal was artefact-free.	Flow Pulse	Analyse artefact-free time per signal
Erase Data – erases all stored data	To erase press button for 3 sec	
Next Calibration – shows date of next recommended calibration on customer's own PC or by Weinmann Technical Service		Internal clock

Accessories for SOMNOcheck micro CARDIO



- 1 Set of 100 nasal cannula, 90 cm
WM 94522
- 2 Softtip sensor CARDIO with Minimed plug (right-angled)
Size. M: WM 94586 (not shown), Size. L: WM 94585
- 3 Wristband
WM 94560
- 4 Transport bag
WM 94055
- 5 Software SOMNOlab, now with SOMNOcheck micro edition
WM 98500
- 6 USB cable WM 94524
- Instructions for use
SOMNOcheck micro CARDIO EN WM 96621 (not shown)
- Patient instructions for use
SOMNOcheck micro CARDIO EN WM 96631 (not shown)

Our complete offering of therapy solutions accessories, mask systems and other technical data are at: weinmann.de

Software system requirements

For a trouble-free installation of SOMNOlab, you will need administrator's rights on an IBM-compatible PC which fulfills the following requirements:

Processor: Pentium IV with 1,8 Ghz

Available space: Hard drive with at least 1 GB available memory and 1 GB available memory on a system partition

Drive: CD-ROM drive

Input: Keyboard and mouse or another pointer supported by Microsoft Windows

Printer: Supported by Microsoft Windows

Operating system and main memory:

- Windows 2000 SP 4 or higher, if compatible with minimum 512 MB RAM, recommended 1024 MB RAM
- Windows XP 32 bit SP 2 or higher, if compatible with minimum 512 MB RAM, recommended 1024 MB RAM
- Windows 7 32 bit / Windows 7 64 bit with minimum 1024 MB RAM, recommended 2048 MB RAM
- Windows 8, 8.1, with minimum 1024 MB RAM, recommended 2048 MB RAM

Additional software: - Internet Explorer 6.0 SP1 or higher if compatible
- Adobe Acrobat Reader 6.0 or higher if compatible

Software

Data import via USB	Visualization of measurement data and events
Event editing	Patient CARDIO fingerprint in report
Extensive documentation Sleep-Disordered Breathing in report	Simple self-calibration – no maintenance costs
Personalize the device	Programmable measurement time and duration

Technical data SOMNOcheck micro CARDIO



Product class as per directive 93/42/EEC:	IIa	Temperature range	
Dimensions (W x H x D):	112 x 30 x 50 mm	■ Operation:	+5 °C to +40 °C
Weight		■ Storage:	-10 °C to +60 °C
■ Without batteries:	79 g	■ Transport:	-10 °C to +60 °C
■ With batteries:	145 g	Pulse oximeter (Clipsensor)	
Power supply:	Type AA – Mignon 2 batteries (about 15 hrs.) 2 NiMH rechargeable batteries (about 20 hrs.)	■ SpO ₂ measurement range:	45 to 100 %
		■ SpO ₂ accuracy	
		70 % < SpO ₂ < 100 %:	better than 2 % accuracy
		SpO ₂ < 70 %:	not validated
		■ Pulse rate measurement range:	30 to 250 bpm
		■ Pulse accuracy:	1 bpm to 2 % of displayed value