GP

HOSPITAL

eHEALTH

REHAB

# *Deep learning (AI)*

## *Our new intelligent ECG analysis!*

Some call it artificial intelligence, we call it deep learning. Our validated neural network which has been trained and tested on several million ECG samples achieves unprecedented detection accuracy.

**custo·med**

EXCELLENCE IN DIAGNOSTICS

# The most intelligent Holter analysis
## Deep learning in ECG diagnostics

Electrocardiography has been an established and indispensable diagnostic procedure for over 100 years. The limitations of traditional algorithm-based Holter ECG evaluation can be overcome with the help of deep learning. custo diagnostic 5.9 provides you with this new technology for almost perfect analysis of the Holter ECG.
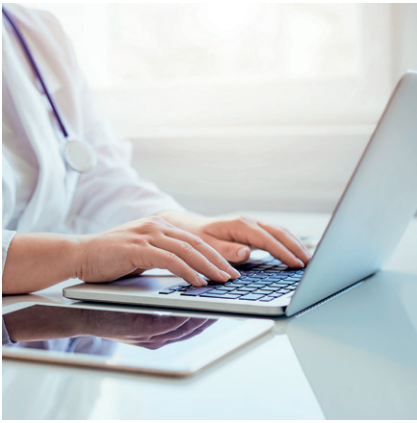
## Your benefits

- *Save time and increase efficiency during evaluation*
- *The most accurate Holter ECG algorithm currently validated on the market*
- *State-of-the-art technology*
- *Future-proof due to continuous further development*
- *More safety in diagnostics*

*"The perfect analysis is the combination of AI and medical expertise."*
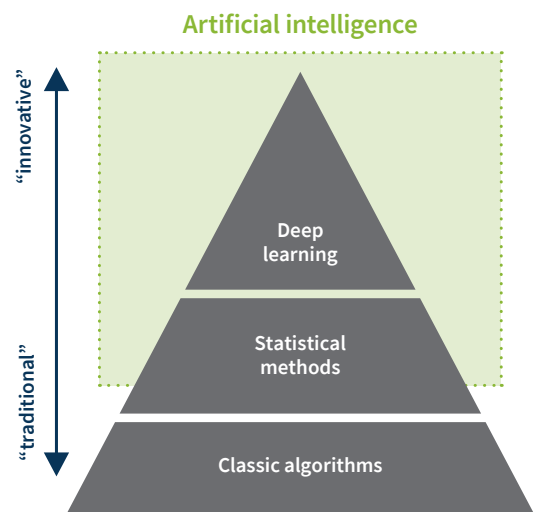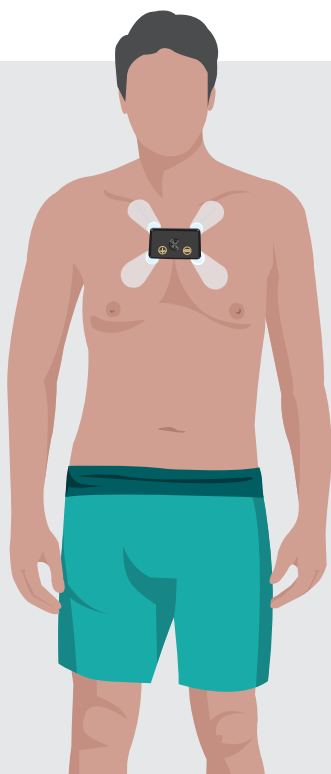
custo med GmbH

# Deep learning in custo diagnostic

- *The specifically validated "Convolutional Neural Network" replaces limited algorithms and achieves a sensitivity / specificity for QRS and PVC detection of over 99 / 97 %.*

- *The robust, efficient and highly precise neural network detects relevant QRS or PVC complexes even in noisy ECG data.*

- *By combining state-of-the-art machine learning approaches, the complexity of ECG signal processing can be continuously improved in the future.*

- *Validation study\* according to MDR using standardized and own databases (MIT, AHA, NST, CST).*

*\* Kraft, D.; Bieber, G.; Jokisch, P.; Rumm, P. End-to-End Premature Ventricular Contraction Detection Using Deep Neural Networks. Sensors 2023, 23, 8573. https://doi.org/10.3390/s23208573*



**Artificial intelligence**

"innovative" — "traditional"

Deep learning

Statistical methods

Classic algorithms

**The connection between AI, machine learning and algorithms**

## PVC detection algorithms in comparison

| Algorithm | Database | Sensitivity | Specificity |
|---|---|---|---|
| Kraft et al* | MIT-11 | 99,1 % | 97,6 % |
| de Chazal et al | MIT-11 | 77,5 % | 90,6 % |
| Jiang and Kong | MIT-11 | 94,3 % | 95,8 % |
| Ince et al | MIT-11 | 90,3 % | 92,2 % |
| Kiranyaz et al | MIT-11 | 95,9 % | 96,2 % |
| Zhang et al | MIT-11 | 97,6 % | 97,6 % |
| Liu et al | MIT-11 | 91,6 % | 95,6 % |

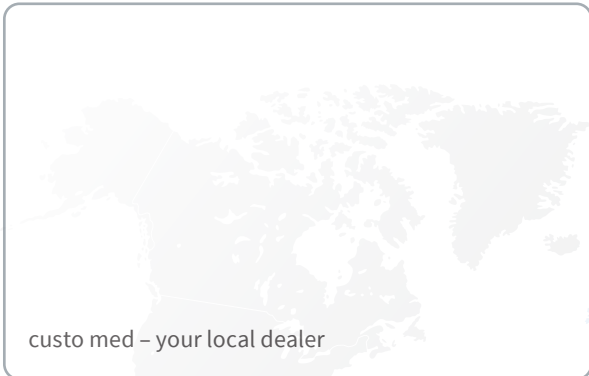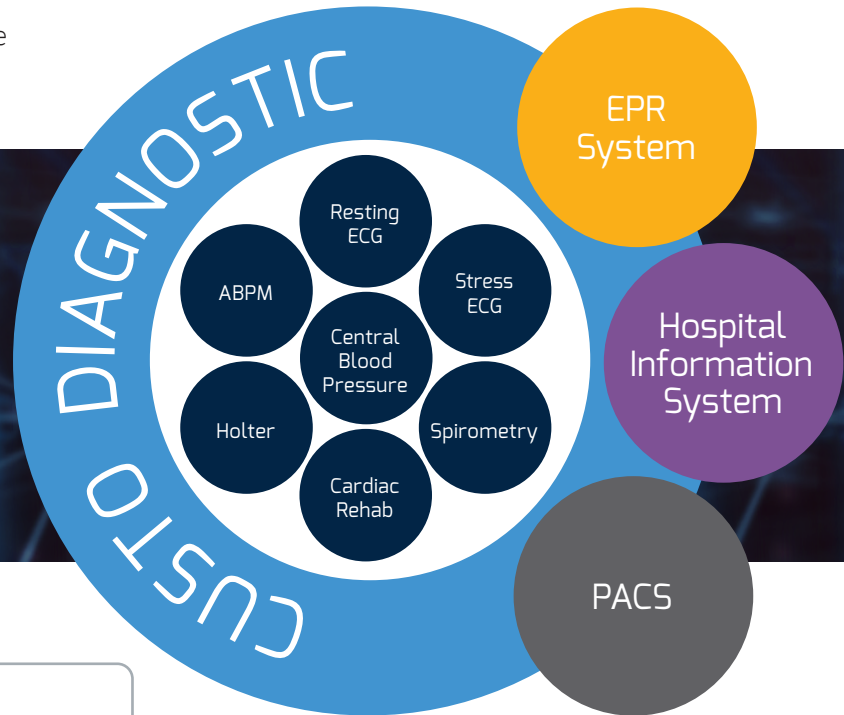# Cardiopulmonary diagnostics for more than 40 years!

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*Our modular platform custo diagnostic is the intelligent link between clinical engineering and administrative software.*

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