



# ChE check mobile

Portable cholinesterase testing system



# Testing cholinesterase inhibition

Organophosphate poisoning in military conflicts and terrorist attacks



## Threats to both soldiers and civilians

In the field a chemical weapon is the most likely form of CBRN weapon to be encountered. The possible use of organophosphorous (OP) compounds such as nerve agents in military conflicts or terrorist attacks is a constant threat to soldiers and civilians.

High numbers of acute intoxications and fatalities caused by OP pesticides worldwide point out the health risks relevant for disaster medicine.

## Cholinesterase (ChE) inhibition

Main target of OP compounds in the body is acetylcholinesterase (AChE). Generally, the degree of enzyme inhibition is proportional to the extent of exposure. The standard treatment should include an individual oxime dosing that has to be monitored to maximize the benefit.

Serum butyrylcholinesterase (BChE) is used routinely for clinical diagnosis and monitoring. Compared to AChE, serum BChE has structural differences which can lead to misinterpretation and false diagnosis of OP poisoning.

## Emergency preparedness

The onset of symptoms after an exposure to OP compounds varies and makes the diagnosis difficult. First of all, clinical symptoms are the basis for the standard treatment. However, the AChE level is the most sensitive status indicator regarding OP poisoning.

Today emergency preparedness should include on-site ChE testing to diagnose as quickly and precisely as possible. Up to now, a robust and reliable testing system was missing.

## New perspectives – ChE monitoring

Monitoring the ChE activity opens up a new perspective in prevention and therapy. By routinely measuring the blood ChE levels, the individual baseline values can be recorded. This helps protect patients from over exposure before concentrations become symptomatic. In acute cases, treatment and medication dosing can be adapted and individually optimised.

# Be prepared with ChE check mobile

Routinely measuring the blood cholinesterase level in the field

## Developed for military purposes

In close cooperation with the Bundeswehr Institute of Pharmacology and Toxicology in Munich, Securetec developed the compact "ChE check mobile". The novel on-site device is used for in vitro diagnostic determination of cholinesterase levels in whole blood.

Based on the photometric measurement of Ellman enzyme kinetics, AChE and BChE activity can be measured in a simple and user-friendly way.

## Designed for ChE testing in the field

Portable and easy to operate, this system is designed for emergency use in the field and routine use in laboratories. Military and civil medical units are now able to diagnose intoxications caused by OP compounds in a fast and efficient way.

"ChE check mobile" is designed and produced according to specifications of the German Federal Armed Forces. Only one drop of blood is needed to obtain values for hemoglobin, AChE or BChE activity.

## Main features and operability

The small, lightweight testing system features the following characteristics:

- Results within 4 minutes
- Portable and easy-to-use with touchscreen
- Convenient and safe finger prick sampling
- Operating temperatures between +10 and +50 °C
- Study proven precision and accuracy due to enzyme specific algorithms
- User gets medical advice to interpret critical results
- Battery powered; 4.8 to 24 V range for vehicle use
- Memory for 1.000 results; USB interface included

The next generation has been specified and will include an effective temperature control for 37 °C. It can be used for therapeutic monitoring of ChE activity. Flash memory technology makes "ChE check" systems future proof and user customisable.



# Innovative and user-friendly – Securetec

## Main handling steps of the assay



1. Start test by determining the background value of cuvette



2. Take blood sample and add glass capillary to cuvette



3. Menu navigates user to measure hemoglobin value



4. Exchange white cap by red "AChE-substrate" cap



5. Dissolve substrate in cap by gently shaking the cuvette



6. Test results are ready within four minutes

## Securetec – who we are

Established in 1995, Securetec Detektions-Systeme AG develops leading edge technology to facilitate the detection of illegal drugs and dangerous substances. Securetec is a global leader in road side drug screening and the detection systems are successfully employed across a multitude of applications.

Our in-house R&D facilities and production processes meet the highest clinical standards. Having direct control of R&D and production allows us to respond quickly to new and emerging threats, specific customer requirements and legal regulations. Since 2004 we have been certified according to EN ISO 13485 and ISO 9001.

We detect to protect.



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