



NATO Military Medicine and Explosive Ordnance Disposal Centres of Excellence continue to push innovation and research to the integration of exoskeletons at the 4th Integration of the Exoskeleton in the Battlefield (IEB) Workshop held in Trenčín Slovakia from April 15th-17th.



This 4th IEB workshop was the fourth and final session in this series of evaluations which used three exoskeleton models from different manufacturers to compare the functionality and human performance factors of each product.

The Military Medicine (MILMED) and Explosive Ordnance Disposal (EOD) Centres of Excellence (COE) established this partnership at the 2nd IEB workshop in early 2018.

The aim of this workshop was to evaluate the possible use and adaptation of exoskeletons in the field of EOD work, evaluate and contrast different exoskeleton models, and provide recommendations for future research activities.

The EOD COE invited the MILMED COE to conduct experimentation during the various TRIALS and to measure human performance factors throughout the exercises. The scenarios were designed to simulate the types of movement during EOD work. The components (trials) of scenarios included:

1. **4 min jogging** - Slow jogging for 4 minutes.
2. **Climbing stairs** - Lift an artillery shell and go up and down the stairs. 3 turns.
3. **Stability slope** - Pick up an artillery shell and carry it along the slope. 3 turns.
4. **Weight lifting** (~20 kg weight) Pick up an artillery shell and put it the top of the box (120 cm). 5 times.



During the scenarios, the operator had to change the type of equipment being utilized. Throughout the first and second scenario trials, the operator applied the exoskeleton without wearing a bomb suit. In contrast, the third and fourth scenario trials were carried out in bomb suit with and without the exoskeleton. The execution of those four TRIALS were carried out by the same operator using the same exoskeleton. In addition to evaluation of the exoskeletons, we had the opportunity to utilize the MTX continuous wireless monitoring system from Cnoga Medical. The MTX monitor continuously monitors 16 bioparameters and weighs only 99gm.

Col. Stefano De PORZI MD (ITA) and WO Attila KECSKÉS (HUN) were nominated by the MILMED COE to execute these trials in collaboration with two engineers from Cnoga Medical Company. The Altitude



Physiology Department of the HDF Medical Central was consulted prior to the trials and provided expert evaluation for the professional design of the interventions.



The technical means and introduction of proper operation of the instruments was provided by External Subject Matter Experts Yehonatan Segman and Natan Cohen from the Israeli Cnoga Medical Company. The results of the primary evaluation were presented to the participants of the 4th IEB workshop on the final day.



The NATO delegates of the summit and representatives of different companies considered it equally important to conduct further research of emerging technologies and innovations for integration in NATO forces.

WO Attila Kecskés
Training NCO
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