USE OF MILITARY PROTECTIVE MASKS AS PHYSICAL TRAINING (PT) DEVICES

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PURPOSE

To provide Soldiers and military leaders with information about wearing military protective masks, specifically the M40 series, during PT as a means to increase aerobic performance.

REFERENCES

See Appendix A for a list of references used to prepare this Technical Information Paper (TIP).

POINTS OF MAJOR INTERST AND FACTS

BACKGROUND

Soldiers reportedly are using military protective masks (e.g., M40) in lieu of purchasing commercially available respiratory muscle training (RMT) devices such as the “Elevation Training Mask” marketed by Training Masks (http://trainingmask.com/pages/About.html). It is believed Soldiers conclude that using a military protective mask provides the same benefits as commercial RMT devices.

INTRODUCTION

The following organizations were contacted in preparing this TIP:

- U.S. Army Research Institute of Environmental Medicine (USARIEM), Thermal and Mountain Medicine Division.
- Maneuver Support Center of Excellence (MSCoE), Capabilities Development Integration Directorate (CDID), Requirements Determination Division (RDD), Combating Weapons of Mass Destruction (CWMD).
- Research, Development and Engineering Command (RDECOM), Edgewood Chemical Biological Center (ECBC).

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- Uniformed Services University, Department of Military and Emergency Medicine, Consortium for Health and Military Performance.

- National Personal Protective Technology Laboratory (NPPTL), National Institute for Occupational Safety and Health (NIOSH).

FACTS

Military protective masks are designed and tested for strenuous use by Soldiers during training, battlefield and other mission duties, particularly Warrior Tasks and Battle Drills.

Respiratory muscles can be trained to increase their strength and aerobic performance. Respiratory muscle training can be achieved using several methods including upper body strength conditioning, whole-body aerobic exercise, pressure-loading breathing devices, and added airflow resistance breathing devices.

Commercial RMT devices are designed to substantially increase the intrathoracic pressures generated by the inspiratory and expiratory muscles in order to produce a physiological training effect. Numerous studies have shown that the pressure increases required to achieve a training effect are large, and substantially greater than the pressures developed by the military protective mask (USARIEM 2013 and Muza 2002).

A statement in advertised RMT literature about aiding acclimatization to altitude is not supported by peer review studies (USARIEM 2013). Altitude acclimatization is developed by the body being forced to breathe an atmosphere with a partial pressure of oxygen lower than that found at sea level. It is the exposure to the hypoxic atmosphere that stimulates the physiological adaptation process, not the resistance to breathing. Therefore, RMT devices are not substitutes for using established and effective altitude acclimatization protocols.

CONCLUSIONS

A military protective mask is not a substitute for an RMT device. Military protective masks will not produce a significant aerobic training effect in physically fit individuals such as Soldiers. Numerous studies have shown that the pressure increase required to achieve a training effect are large, and substantially greater than the pressures developed by the military protective mask (USARIEM 2013). Use of military protective masks is appropriate for mission and duty related training and operations, particularly Warrior Tasks and Battle Drills. Duty assigned military protective masks used for training and familiarization must be maintained and cleaned according to applicable technical manual and doctrine.

Prepared by: Mr. Stephan C. Graham, Industrial Hygiene Field Services

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APPENDIX A

REFERENCES

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