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The revolution in biotechnology presents unprecedented opportunities and dangers for the health and well being of mankind. Today, one can plausibly imagine the eradication of many historic diseases. One can also envisage the creation of new diseases that would endanger a substantial proportion of the entire human species.

As powerful applications for biotechnology research are identified, appropriate arrangements for managing their extraordinary consequences will inevitably become necessary. This presentation will explore recent efforts to balance science and security policy in the area of advanced biotechnology research. Key developments on the dual-use issue will be discussed, together with a variety of governance options aimed at mitigating the risk from such research.

Key words: Dual-Use, Biological Weapons, Biotechnology Research

19. PAKISTAN'S APPROACH TOWARDS CHEM-BIO ISSUES (9)

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Pakistan ratified the BWC and CWC as a non-possessive state at that time when international environment were fraught with uncertainties about Chem-Bio threat. The geographical location of Pakistan faces a serious multidimensional WMD threat which includes threat from, non-state actors and her neighbours especially after declaration of chemical weapons during process of ratification of CWC. Pakistan never pursued such chem-bio program with the aim to use it as a mean of deterrence in overall context of security policy and always encouraged any move regarding strengthening of national/international institutional efforts to counter potential misuse of chem-bio technology.

Pakistan's position has consistently been positive, pragmatic and supportive. For better implementation of BWC and CWC in Pakistan, comprehensive policies have been formulated and National Authority has been established to work as National point of contact on CWC affairs.

Pakistan CWC Act 2000, Pakistan Bio Safety Rules 2005 and Pakistan Export Control Act 2004 are the evidences of Pakistan's sincerity to the implementation of CWC and BWC. Pakistan has declared 15 industries involved with chemicals, out of which 06 have already been inspected by OPCW Inspectors. Pakistan has declared its national protective program and pursuing all possible measures to enhance the national capacity and potential to guard against chem-bio threats. Pakistan has proved that it is committed to the principles of disarmament, which could serve as confidence building measures and may help reducing distrust and regional tension.

20. THE ENVIRONICS MOBILE CBRN DETECTION SYSTEM (10)

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Environics Oy has developed a novel monitoring system for detection of Chemical, Biological, Radiological and Nuclear compounds. The system is portable and rapidly installed into a monitoring location. It will allow real time monitoring and alarming of:

- Chemical Warfare agents (Nerve, Blister, Blood),
- Toxic industrial chemicals (General toxic-alarm),
- Biological warfare agents (Bacteria, viruses, toxins),
- Radiological agents such as alpha and gamma radiation.

Monitoring Station makes continuously measurements. Sensor data is processed and stored to local database by the Master Module (MM) that is located within the station. The MM sends the data to the Control Centers by using communication network. The Control Center receives and logs the data and shows it in real time on a map interface. The status of each sensor and detector can be seen in real time.

21. INNOVATIVE CONCEPTS AND OPERATIONAL TECHNIQUES FOR THE STRATEGIC NATIONAL STOCKPILE (7)

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This presentation is to discuss the innovative concepts and operational techniques developed by the Center for Disease Control and Prevention's Division of Strategic National Stockpile (DSNS). The primary response model for the SNS is to move from secure strategic storage locations to an area of need within 12 hours to augment local resources. While this 12 hour response is appropriate for most threat scenarios, it clearly cannot meet the needs of first line responders who need to rapidly administer initial dosing of nerve agent antidote. To address the threat of nerve agent poisoning the DSNS developed the CHEMPACK Project which allows centralized SNS management forward placement within hundreds of local jurisdictions.

Another variation from the primary mission of the DSNS is addressing the nation's potential shortfall in non-acute care bed capacity. To address this mission, the Federal Medical Station (FMS) program was created to build surge capability to meet a range of non-acute medical needs following a disaster. The FMS model is a pre-configured 250 bed unit that is deployable throughout the Nation and configured to respond rapidly.



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Operational techniques used to maximize product lifespan and efficacy will also be discussed.

Key words: Terrorism, Nerve Agent, Response, Public Health Emergency, Critical Medical Assets, Deployable

22. FIT FACTOR OF RESPIRATORS AGAINST CBR AGENTS OF NANOPARTICLES DIMENSIONS (5)

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Personal protective equipment including respiratory protective devices is generally considered to provide adequate protection efficiency for exposures to nanosized CBR particulates, but at the other side no one is certain how effective are respiratory protective devices against CBR nanoparticles contaminants. Methodologies that are currently used in the aim of measuring particle exposures were in the most of cases not sufficiently sensitive to measure occupational or ambient nanoparticle aerosol concentrations, whether in terms of particle mass, particle numbers, or surface area.

There are two different mechanisms of inward leakage into respirator: (1) filter penetration, and (2) leakage flow through orifices and cracks between face and facepiece, in exhalation valve, and in facepiece body. Filter penetration is recently investigated, electret filter are much more efficient than mechanical filters for protection against CBR nanosized particles. Filter efficiency is better for inhalation flow of 30 lpm than 85 lpm. Uncertainties related to efficiency of respiratory protective devices against CBR nanoparticles are primary due to face seal leakage or it may be underlined that methods and methodology of fit factor of respirator determination in domain of CBR nanosized particles must be more investigated.

In this paper it is discuss distribution of protection factor of RPD measured on two respirators for one male and one female subject, test is repeated 30 times for both of subjects. Distribution of PF for male and female subjects was compared with distribution of PF for population, measured on 30 subjects. Challenge atmosphere was polydisperse aerosol of NaCl with MMD=0.47 μm , $\sigma\text{g} = 2.21$, CMD=0.071 μm .

23. DETERMINATION OF ACETYLCHOLINESTERASE AND BUTRYLCHOLINESTERASE ACTIVITIES IN WHOLE BLOOD AND PLASMA FROM DIFFERENT COMMUNITIES OF KHOSASTAN PROVINCE (IRAN –IRAQ WAR AREA) EXPOSED TO ORGANOPHOSPHATE COMPOUNDS (4)

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It is well known that Organophosphate Compounds are widely used as pesticides. Therefore while handling, applying or using these compounds care and safe use should be considered. The main mechanism of toxicity action of Organophosphate Compounds is the inhibition of Acetylcholinesterase and Butrylcholinesterase enzymes. It is well known that the activity measurement of Acetylcholinesterase in whole blood and Butrylcholinesterase in plasma samples are potential biomarker of exposure to Organophosphates compounds. In this study AchE and BchE activities were determined in whole blood and plasma samples of farmers from two different area of Khosestan province of Iran Gotvand and Dashte Azadegan (Iran –Iraq war zone). Determination of enzymes activities were based on the Ellman colorimetric method which was modified by Worek et al.

The results obtained in this study showed that Gotvand area showed lower than normal value and Dashte Azadegan (war area) were significantly lower than the mean of activities in reference group ($P < 0.05$).

Also results of this study showed Acetylcholinesterase and Butrylcholinesterase inhibition can provide a good biomarker of exposure to OP pesticides in field studies in human population with consideration of other different parameters and factors which will be discussed.

24. THE 4th CIVIL SUPPORT TEAM (WEAPONS OF MASS DESTRUCTION) (11)

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The 4th CST (WMD) is a 22 person joint staffed AGR (Active Guard Reserve) unit of the Georgia National Guard. The team is one of 55 CSTs that are charged with responding to a CBRNE (Chemical, Biological, Radiological, Nuclear, and High Yield Explosive) incident within the United States and its Territories. The mission statement of the CST is to support civil authorities at a domestic CBRNE incident by identifying CBRNE agents/substances, assessing current and projected consequences, advising on response measures, and assisting with appropriate requests for state support.

The team possesses the capability to deploy by sea, air, and land in response to a terrorist attack or natural disaster. The team is comprised of seven officers and fifteen non-commissioned officers who are cross trained in a variety of military disciplines. Equipment assigned to the team includes an Analytical Lab, Communications Suite, Tactical Operations Center, closed and open circuit breathing gear, portable and handheld detectors, and decon support.



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