



ETHREAT COURSE FOR EU FRONT-LINE HEALTH PROFESSIONALS

Syllabus

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Introduction

ETHREAT (European Training for Health Professionals on Rapid Response to Health Threats) is a European Public Health Project launched in May 2005, and is co-funded by the European Commission. The aim of ETHREAT is to plan and develop an educational package containing the knowledge and training material necessary to empower European health professionals, including armed forces health personnel, to rapidly recognize and adequately respond to new public health threats, in the form of attacks with chemical, biological, and radiological (CBR) agents. The most important deliverable of this project will be a pilot course on CBRN threats for EU front-line health professionals including public health (PH) officers.

Target Audience

The ETHREAT project targets front-line health professionals, which for the purposes of the project are defined as: medical practitioners and nursing staff in civilian or military facilities, especially those working in emergency departments or in primary healthcare, as well as public health officials especially at the local level and Emergency Medical Services personnel.

Objectives of the ETHREAT course

The main objective of the ETHREAT course is to give front-line health professionals an overview of the clinical picture and the management modalities available for patients exposed to CBRN agents, as well as inform them about the public health perspective of a terrorist attack using such agents. The ETHREAT course will be available to all EU MS to be used in their context.

Background

Before designing the training programme the project team addressed a number of important questions, including:

- ✓ What CBRN training programmes are currently available?
- ✓ Do these programmes meet the needs of attendees?
- ✓ Which are the educational objectives, and what should the content of a new training programme include?

These questions were included in two questionnaires administered in hard copy form and via the project website from March to September 2006 to front-line health professionals and experts in CBRN issues in the EU countries.

The FLHP questionnaire comprised of 47 questions. The total valid questionnaires returned were 231 from 23 European countries. More than 50% of the responding FLHPs feel that they are currently poorly or very poorly prepared to deal with a chemical (53,3%), biological (47,2%) and radiological (57,6%) incident and similar numbers of FLHPs are not confident (mean 57,7%) that they could discriminate a naturally vs. a man-made incident.

The CBRN expert questionnaire included 40 questions and 63 valid questionnaires were returned from 16 EU MS. Six (37,5%) EU MS report having courses on CBRN threats for health professionals at all educational levels, while the majority of existing courses are defined as professional training. Despite the available training courses though, the majority of the responding experts believe that <25% of FLHPs in their country could recognize and manage a biological [27 (42,9%)], chemical [24 (38,1%)] or radiological incident [33 (52,4%)], as far as their role requires. The majority of experts also believe that <25% of FLHPs in their country could discriminate between a man-made versus a natural incident involving CBRN agents. Sixty percent of the responding experts (38) believe that FLHPs in their country are better trained for natural incidents.

Proposed Syllabus

The proposed ETHREAT course has been developed on the understanding on one hand that the trainees' time is limited and on the other hand on the principle that the trainee will retain most information only if he/she actively participates in the learning process.

In order for the trainees to be able to participate actively, the course needs a developed manual and/or an e-learning activity, available at least a month before the actual course takes place. The trainees would then have the time to review all materials ahead of time and prepare for the course.

The course actually includes three major groups of lectures addressing Chemical, Biological and Radiological Threats as well as a group of lectures with the perspective of implications to and involvement of public health.

Lectures on Chemical Threats

These lectures aim to introduce important aspects of high threat chemical agents such as their history of development, their potential for terrorist use, and the clinical presentation and management of exposed persons.

- History of chemical war and the chemical weapons Convention/OPCW 30 min

This lecture aims to introduce trainees to the history of chemical warfare and the activities of the international community to control future uses, i.e. the Chemical Weapons Convention and OPCW.

The presentation is structured to include the following:

- ✓ Chemical weapons that have been used during former wars.
- ✓ The role of the Chemical Weapons Convention and the Organization for the Prohibition of Chemical Weapons (OPCW): outline objectives, activities, international assistance etc.

After the presentation the trainees should be:

- ✓ Familiar with the incidents of historical use of chemical weapons
- ✓ Familiar with the CWC and OPCW

- Clinical syndrome-based recognition of chemical hazards 30 min

This lecture aims to introduce the trainees to the toxicological and clinical syndromes in patients exposed to the high priority groups of chemical agents, as well as the differential diagnosis involved. The presentation is structured to include the following:

- ✓ Toxidromes and clinical syndromes of persons exposed to the high priority categories of chemical weapons and agents.

After the presentation the trainees should be:

- ✓ Familiar with the differential diagnosis of a patient exposed to chemical agent(s).

- Clinical Presentation of Chemical warfare agents-I 45 min
- Clinical Presentation of Chemical warfare agents-II 45 min

This set of lectures aims to introduce the trainees in more detail to the clinical presentation of each different group of chemical agents and make them familiar with the clinical symptoms and development of the disease. A number of chemical agents are suggested, which were either created as warfare agents or have a history of use in a terrorist incident. These are:

- nerve agents,
- blister or vesicant agents and oximes,
- blood agents,
- asphyxiants or pulmonary agents and finally
- riot control agents.

Each lecture section devoted to a group of agents should address the following:

- ✓ Classes of agents (reference to names, common or trade names)
- ✓ Mechanism of action of each group (target organs, biological effects etc)
- ✓ Symptoms and signs in exposed humans

After the presentation the trainees should be:

- ✓ able to understand the pathophysiology of the clinical picture of each group of agents.
- ✓ able to recognize the clinical picture of humans

- Medical Management of mass chemical casualties 45 min

This lecture aims to introduce trainees to the medical management of mass chemical casualties. Main target information will be the treatment options available. The presentation could be structured to include the following:

- ✓ Introduction to the decontamination principles (as there is a separate lecture devoted only to the decontamination process)
- ✓ Principles for personnel safety (choice of PPE, strategy etc)
- ✓ Antidotes available for each group of agents, availability and methods of delivery
- ✓ Management of dead bodies

After the presentation the trainees should be:

- ✓ Familiar with the PPE to be used by healthcare workers (HCW) for treating exposed agents
- ✓ Familiar with the antidotes and the methods of administration to be used against high threat chemical agents.

- Chemical Accidents and the Role of Public Health Professionals 45 min

This lecture aims to introduce trainees to the possibility of responding to an industrial chemical incident which may be accidental or intentional. The lecture gives an overview of major world wide industrial accidents focusing on events affecting the European Union (EU) Member States (MS).

The lecture would include:

- ✓ Overview of major worldwide industrial accidents, their consequences for the population and the environment.
- ✓ How possible is the use of TIC/TIMs by terrorists?
- ✓ Lessons learnt from recent incidents and policies in force currently, focus in the EU
- ✓ Involvement of the health sector, esp PH in the response to these accidents

After the presentation the trainees should be:

- ✓ Familiar with industrial chemical agents as threats to PH, and
- ✓ Familiar with the principles for the prevention of chemical accidents and the health professionals' role in the response to chemical accidents

- Practical demonstration of medical management of chemical casualties 45 min

This is a practical demonstration proposed by the ETHREAT team aiming to familiarize the trainee by using a simulation environment, with the multitude of issues to be dealt with and the expertise needed while responding to a chemical incident with human casualties. In this particular course we plan to use a computerized simulator/mannequin (Laerdal™ CBRN SimMan) in responder uniform and in civilian clothing.

After the presentation the trainees should be:

- ✓ Familiar with chemical casualties management in practice.

Other possibilities may be to organize

- ✓ a small field exercise with use/practice with PPE or
- ✓ a demonstration by an expert EMS team trained in CBRN response of a rescue after a suspicious incident

Lectures on Biological Threats

These lectures aim to introduce important aspects of very high threat biological agents such as their history of development, their potential for terrorist use, and the clinical presentation and management of exposed persons.

- History of biological warfare 30 min

This lecture aims to introduce trainees to the history of biological weapons and their use in past instances, as well as the need for a list of biological agents of public health interest.

The presentation could be structured to include the following:

- ✓ Biological agents that have been developed to weapons
- ✓ Biological agents that have been used in the past during conflicts or as a terrorist act
- ✓ The Biological Weapons and Toxins Convention and its current status.

After the presentation the trainees should be:

- ✓ Familiar with the list of biological agents used as weapons.

- Clinical syndrome-based recognition of very high threat biological agents 30 min

One of the clinically most confusing characteristics of the most dangerous biological agents to be used in a terrorist attack is that the relevant diseases start with common clinical symptoms usually progressing rapidly to a very serious and/or lethal disease.

This lecture aims to introduce the trainees to the clinical syndromes presenting in patients exposed to very high threat biological agents and the possible clues for differentiating the high threat agents, as well as the general differential diagnosis involved.

The presentation is structured to include the following:

- ✓ clinical syndromes of persons exposed to the list of very high threat biological agents
- ✓ differential diagnosis

After the presentation the trainees should be:

- ✓ Familiar with the differential diagnosis of a patient exposed to very high threat biological agent(s).

- Clinical presentation of very high threat biological agents-I 45 min
- Clinical presentation of very high threat biological agents-II 45 min

This set of lectures aims to introduce the trainees in more detail to the clinical presentation of each biological agent in the very high threat list, as well as the clinical symptoms and development of the disease. These are:

- Anthrax
- Plague
- Tularemia
- Smallpox
- Viral agents
- Encephalitides
- Toxins

The presentation for each agent could be structured to include the following:

- ✓ Epidemiology, vector and transmission pathways, incubation period, pathophysiology
- ✓ Clinical picture and mortality
- ✓ Diagnosis and diagnostic capabilities

After the presentation the trainees should be:

- ✓ Able to name the very high threat pathogens
- ✓ Familiar with the disease caused by each of the biological agents in the very high threat list.

- Medical Management of mass biological casualties 45 min

This lecture aims to familiarize trainees with the treatment modalities available for the diseases caused by the agents of very high threat.

The presentation could be structured to include the following:

- ✓ Treatment (i.e. antibiotics and other pharmaceuticals, supportive therapy).
- ✓ Management of dead bodies
- ✓ Post-exposure prophylaxis
- ✓ Vaccination and vaccination strategies
- ✓ Isolation/Quarantine (guidelines for infectious diseases, impact in social life).

After the presentation the trainees should be:

- ✓ Familiar with the treatment available for the exposed and patients, the vaccines available and the strategies to be used for controlling their transmission.

Lectures on Radiological Threats

These lectures aim to introduce important aspects of radiological threats in the perspective of terrorism as opposed to that of nuclear warfare.

- Introduction to medical radiology 30-45 min

This lecture aims to give an overview to the trainees of medical radiology and the special properties of radioactivity, as well as an overview of past accidents involving radioactive material and their management.

The presentation could be structured to include the following:

- ✓ Radioactive sources
- ✓ Radioactivity measuring units
- ✓ Nuclear weapons (related health risks etc)
- ✓ Accidents involving radioactive sources and their consequences
- ✓ Measures used for controlling radioactive source movement
- ✓ The "dirty" bomb threat (definition, symptoms, health risks)

After the presentation the trainees should be:

- ✓ Familiar with the units used for measuring radioactivity and its effects on humans
- ✓ Familiar with accidents involving radioactive sources

- Medical Management of radio-contaminated casualties 30-45 min

This lecture aims to introduce trainees to the medical issues of the management of radio-contaminated casualties.

The presentation could be structured to include the following:

- ✓ Contaminated vs. irradiated patient
- ✓ Management of casualties at the incident site (response, decontamination, first aid, transportation to hospital)
- ✓ Management of casualties in the hospital (response, decontamination, treatment)

After the presentation the trainees should be:

- ✓ Familiar with the management of radio-contaminated casualties.

Public Health Aspects of RBC Threats and Terrorism

These lectures aim to introduce important aspects of very high threat biological agents such as their history of development, their potential for terrorist use, and the clinical presentation and management of exposed persons.

- Grounding the terrorism threat into reality 30 min

This lecture aims to introduce trainees to the open-source information available on the feasibility of a real terrorist incident. The presentation intends to address the following:

- What is the definition of a terrorist attack?
- Is it easy and feasible in the current day and age to launch a terrorist attack with a CBRN agent, focusing in the EU member states?
- Overview of incidents involving RBC agents until now
- Strategic evaluation of current terrorism behavior
- Can the civilian health sector deal with a real terrorism CBRN incident and how?

After the presentation the trainees should be:

- ✓ Familiar with the current thinking regarding CBRN incidents.
- ✓ Aware of the major incidents where chemical and biological agents have been used
- ✓ Aware of the vulnerability of modern societies and especially health systems
- ✓ Aware of the need for appropriate preparedness planning ahead of time to face such incidents

- Public Health and Terrorism: Clues and Preparedness Planning Issues 30 min

Terrorist acts, especially during the last years have significant effects to or aim to threaten public health. The same is also true in the case of natural disasters. It has become general knowledge that multi-purpose preparedness planning is essential for the PH sector in order to be able to respond to such demands.

This lecture aims to familiarize trainees with the role of public health in the response to a CBRN incident, as well as give an overview of the preparedness planning principles for PH services. The presentation would be structured to include the following:

- The definition of an overt vs. covert attack
- Clues for suspecting and differentiating between natural vs. manmade incidents, new methods and capabilities of PH systems
- Consequences of a terrorist attack for the public health system
- Highlight the pivotal role of the public health system in terrorism preparedness and response.
- Overview of principles to create a terrorism/generic preparedness plan, consistent with the available resources, capabilities and needs.

- Need for risk assessment with a public health perspective

After the presentation the trainees should be:

- ✓ Aware of the fact that terrorism concerns the public health system at all levels.
- ✓ Aware of the importance of the appropriate preparation of the public health system in order to face a CBRN incident.

- Basic Principles of Hospital Preparedness 45 min

Hospitals are the final recipient of casualties after natural or man-made disasters. At the same time they are institutions that already work under pressure in the current health systems of most EU countries. As a consequence it is vital that each hospital develops a disaster or emergency preparedness plan that outlines its function and surge capacity in different emergency scenarios. This lecture aims to familiarize trainees with the need and the principles of a hospital disaster plan, focusing in the need to respond to a bioterrorist incident. The presentation could be structured to include the following:

- ✓ Outline of hospital preparedness planning process
- ✓ Hospital emergency plan sections (focus on CBRN event)
- ✓ Need for organized exercises
- ✓ Training process for HCW involved in the response to a hospital emergency.
- ✓ Examples of hospital disaster response

After the presentation the trainees should be:

- ✓ Aware of the need to develop hospital disaster plans
- ✓ Familiar with the required training, capabilities and equipment needed for a hospital to deal with a bioterrorist incident.

- Triage issues in mass casualty situations 45 min

Triage refers to the process of prioritizing casualties for receiving emergency health care and later for transportation to a hospital facility. Triage aims to maximize the positive effects of limited medical resources in a mass casualty incident (MCI).

This lecture aims to introduce trainees to the principles and special issues involved in the triage process at a MCI, especially when CBRN agents are involved. The presentation could be structured to include the following:

- ✓ Definition of triage (definition of stages)
- ✓ Triage systems [e.g. START]
- ✓ Peculiarities of CBRN triage (the majority of incidences are at high risk, the need for decontamination etc)
- ✓ Ethical aspects (in what way one's life is more valuable than another's etc)

After the presentation the trainees should be:

- ✓ Familiar with the principles and the need of triage.

- Decontamination of CBRN casualties 45 min

Decontamination of patients exposed to a radioactive, chemical or biological agent presents significant problems during the response to a possible terrorist event involving CBRN agents. This lecture aims to introduce trainees to the principles of decontamination of CBRN casualties.

The presentation could be structured to include the following:

- ✓ Guidelines of decontamination of casualties
- ✓ Equipment needed for decontamination
- ✓ Decontamination process at the scene of an incident and at the hospital
- ✓ Overview of different decon techniques (buddy-to-buddy to mass decontamination)
- ✓ Contaminated waste management.

After the presentation the trainees should be:

- ✓ Familiar with the principles of decontamination
- ✓ Aware of the guidelines of decontamination of persons exposed to CBRN agents.

- Role of Public Health Officers in planning and response to Health Threats 45 min
As mentioned above PH is threatened by natural disasters and acts of terrorism. This lecture aims to familiarize trainees with the fact that CBRN terrorism is a matter of public health. In this perspective public health officers are front line health professionals and their role is fundamental as responders to such situations. The presentation could be structured to include the following:

- ✓ Highlight the pivotal role of the public health officers in terrorism preparedness and response
- ✓ Training needed
- ✓ The EU platforms and tools

After the presentation the trainees should be:

- ✓ Aware of the role of public health in the response to a terrorist act
- ✓ Aware of the communication, alert and coordination mechanisms available at a european level.

- Risk and Crisis Communication Issues 30-45 min

Risk and crisis communication are two issues that play a fundamental role in crisis management especially during events that may have health consequences or human casualties. Their role has been recognized as quite important as far as public health is concerned.

The aim of this lecture is to introduce trainees to the definitions and the principles of risk and crisis communication. The presentation could be structured to include the following:

- ✓ Definitions (risk communication, crisis communication)
- ✓ Basic principles of risk communication
- ✓ Basic principles of a communication plan
- ✓ How to face the media and the public, during a crisis (focus in epidemics, terrorism acts).

After the presentation the trainees should be:

- ✓ Familiar with the basic principles of risk communication
- ✓ Aware of the need for developing a communication plan
- ✓ Familiar with the qualities needed for a spokesperson to the media and the public.

- Psychological effects of terrorism and WMD 30-45 min

Psychological effects of disasters and terrorist acts have become the focus of intense interest especially in recent years, proving that significant psychological aftermath stays with the population, especially its vulnerable portions for years. At the same time psychological effects of terrorist acts involving human loss has been recognized as a significant problem for the staff of first responding teams as well as hospital personnel. This lecture aims to introduce trainees to the research and findings about psychological effects of terrorism. The presentation could be structured to include the following:

- ✓ Posttraumatic stress disorder (PTSD) for the population and the first responder teams
- ✓ Outline of psychological effects of terrorism
- ✓ Principles of prevention and management of psychological effects of terrorism.

After the presentation the trainees should be:

- ✓ Aware of the psychological effects of terrorism
- ✓ Familiar with treatment modalities and management of psychological effects

- Exercise on chemical and biological scenario 60 min

Aiming for a practical application of the course information, we propose the inclusion of one or two scenarios developed for this purpose in the form of mini-tabletop exercises. The coordinators will present a scenario of an incident (chemical and/or biological) and they would ask the participant to respond to certain questions regarding their response and management strategies. This can be fashioned in two ways:

- ✓ multiple choice questions answered by the participants individually and then discussed by all or
- ✓ open-ended questions that can be answered by the participants, who have been divided in small working groups of 3-5 persons each and then discussed by all.

Glossary

CBRN	Chemical, Biological, Radio-Nuclear usually referring to agents or weapons
CWC	Chemical Weapons Convention
EC	European Commission
ED	Emergency Department
EMS	Emergency Medical Services
ETHREAT	European Training for Health Professionals on Rapid Response to Health Threats
EU	European Union
HCW	Health Care Workers
MCI	Mass Casualty Incident
OPCW	Organization for the Prohibition of Chemical Weapons
PH	Public Health
PPE	Personal Protective Equipment
PTSD	Post-Traumatic Stress Disorder
RBC	Radiological, Biological and Chemical, usually referring to agents or threats
START	Simple Triage and Rapid Treatment, refers to a simple triage system used in mass casualty situations
TIC	Toxic Industrial Compounds
TIM	Toxic Industrial Material
WMD	Weapons of Mass Destruction

Bibliography

1. Handbook of Clinical Management of Communicable Diseases and Agents of Deliberate Release, Hellenic Centre for Infectious Diseases Control, Athens 2004
2. Kales SN & Christiani DC, Acute Chemical Emergencies N Engl J Med, 2004; 350(8): 800-808.
3. Guidance document on use of medicinal products for treatment and prophylaxis of biological agents that might be used as weapons of bioterrorism (EMEA/CPMP/4048/01), <http://www.emea.europa.eu/htms/human/bioterror/bioterror.htm>
4. P. Bossi, A. Tegnell, A. Baka, F. Van Loock et al. BICHAT guidelines for clinical management of anthrax, plague, smallpox, tularaemia, hemorrhagic fever viruses, botulism, brucellosis, Q fever, glanders and melioidosis and viral encephalitis, Eurosurveillance Monthly, 2004;9(12):19-40. (<http://www.eurosurveillance.org/releases/index-02.asp?an=2004&display=em>)
5. A. Tegnell, F. Van Loock, A. Baka, et al. Development of a Matrix to evaluate the threat of biological agents used for bioterrorism. Cel Mol Life Sci, 2006;63: 2223-28.
6. HPA_Deliberate Release Homepage: http://www.hpa.org.uk/infections/topics_az/deliberate_release/menu.htm
7. CDC, Atlanta: Emergency Preparedness & Response (<http://www.bt.cdc.gov/>)