

## CHAPTER 4

## MANAGEMENT

## SECTION I - INTRODUCTION

**401. Management Approach.**

Precise diagnosis of biological agent casualties in an NBC environment is likely to be difficult. Both casualties and medical personnel may be in full IPE. Signs and symptoms of biological agent infection or intoxication are common to many diseases. Biological warfare casualties may coexist with conventional, nuclear and/or chemical warfare casualties. Adequate or appropriate laboratory facilities may not be available. The treatment required for BW casualties will not differ in basic principle from that in patients suffering from the same disease incurred by natural means, but the approach to management will necessarily differ from that used in peacetime.

## SECTION II - CASUALTY DECONTAMINATION

**402. Decontamination of Exposed Personnel.**

- a. **Primary Contamination.** Dermal exposure from a suspected BW attack should be managed by decontamination at the earliest opportunity. In the absence of agent-specific guidance, exposed areas should be cleansed using an appropriately diluted sodium hypochlorite solution (0.5%) or copious quantities of plain soap and water. This should follow any needed use of decontaminants for chemical agents but should be prompt. Potentially contaminated clothing should be removed as soon as is practical by protected personnel (that is, in full IPE) in an area away from non-contaminated patients. Following decontamination, the casualty should be protected from further exposure if transported or cared for outside a Colpro system.
- b. **Secondary Contamination.** Secondary contamination of medical personnel from clothing or equipment of exposed soldiers may be important. This is particularly worrisome from casualties recently exposed near the dissemination source where high levels of contamination may occur. Since it will be difficult to distinguish those soldiers exposed near the source from those contaminated some distance away, proper physical protection of health care providers or other persons handling exposed personnel should be maintained until decontamination is complete.

## SECTION III - TREATMENT

**403. Principles of Treatment.**

- a. **General Supportive Measures.** Measures should be taken to lower temperature; relieve pain; maintain spontaneous respiration; and secure an intravenous access for

- the administration of drugs and fluids. Symptomatic treatment and treatment of coexisting injuries should follow established principles.
- b. *Isolation Procedures (Barrier Nursing)*. In the context of biological agent casualties, adherence to principles of patient isolation is essential to preventing cross-infection with transmissible agents. Separation of non-affected individuals from contaminated victims of biological agent attack (cohorting; reverse quarantine) and implementation of barrier nursing procedures should be initiated as soon as practical after a BW incident.
  - c. *Antibiotic Therapy*. Antibiotics must be given to all BW casualties, even without a firm diagnosis. Most bacterial, chlamydial, and rickettsial diseases respond to antibiotics. The choice of drug depends on the clinical circumstances, but one broad-spectrum antibiotic should be administered in full therapeutic doses, parenterally if possible, and preferably intravenously, and commenced at the earliest possible level of medical care. The choice of antibiotic will depend upon many factors, including the specific threat or threats, evidence or suspicion of natural antibiotic resistance among strains, and the ease with which drug resistance can be artificially engineered. Where applicable, specific guidelines are included in Annex B.
  - d. *Antiviral Therapy*. The only "broad-spectrum" antiviral drug currently available is ribavirin. This compound has been a useful adjunct to the treatment of some potential viral threats when they have occurred under natural conditions (Lassa fever, Crimean-Congo hemorrhagic fever, hemorrhagic fever with renal syndrome). In addition, there is evidence of antiviral activity *in vitro* and *in vivo* against certain other viruses (influenza, Junin virus, Rift Valley fever (RVF) virus), but little or no activity is seen with other (filoviruses, togaviruses) agents. Other antiviral drugs, such as amantadine, acyclovir, and azidothymidine, are restricted in their therapeutic spectrum to single virus families, and thus have little application as non-specific antiviral. Where applicable, specific guidelines are included in Annex B.
  - e. *Antitoxin Therapy*. Specific antitoxins are available for certain conditions. Where applicable, specific guidelines are included in Annex B. No broad-spectrum antitoxins currently exist.

#### SECTION IV - PROTECTION OF HEALTH CARE PERSONNEL

##### 404. Use of Barrier Techniques.

Following decontamination, patients are cared for using standard nursing management techniques including universal infectious disease precautions (barrier nursing). Protection of medical personnel is offered through use of impermeable surgical gowns/oral-nasal masks/face shields or goggles/surgical gloves and observance of universal (body fluid) precautions/barrier nursing techniques.

##### 405. Potential Biological Hazards.

Significant risk for person-to-person spread may exist for individuals *not* directly involved in patient care. In particular, materials soiled by patient secrets and excreta, as well as

samples for diagnostic laboratory study, must be clearly identified as hazardous and appropriate handling procedures applied. Similarly, invasive medical and surgical procedures pose potential risks. It must be emphasized, however, that not all biological agents pose a hazard for secondary transmission. (See Annex C for specific concerns.) For example, clinical laboratory samples from toxin-exposed subjects can be dealt with routinely. Patients showing signs of pneumonic plague generally should be considered hazardous, as some will disperse plague bacilli by aerosol. Although cutaneous anthrax may result from contact with blood or other body fluids contaminated with vegetative anthrax bacilli, exposure of health care providers to open lesions or blood from anthrax patients does not pose a risk of inhalation anthrax. Bacilli exposed to air, however, will sporulate (after a period of hours). This will pose a subsequent theoretical risk for inhalation anthrax. On the other hand, vegetative forms of plague bacilli may be dangerous, since, under some circumstances, they are known to cause aerosol infections. Therefore, postmortem examinations of victims of transmissible biological agents should be performed using barrier techniques, with appropriate consideration given to specific respiratory protection.

## SECTION V - HANDLING OF CONTAMINATED REMAINS

### 406. General Considerations.

The handling of biologically contaminated remains within the medical system is a medical responsibility. However, the disposal of biologically contaminated remains on the battlefield or after removal from the medical system is not a medical responsibility.

### 407. Risk Avoidance Procedures.

Those charged with the responsibility for handling and disposing of biologically contaminated remains must be cognizant of potential secondary transmission hazards. Corpses should be interred according to current NATO procedures until definitive decontamination measures are implemented. Interment for a period of days permits natural chemical and microbiological decomposition processes to reduce or eliminate any later risk from toxins, viruses, and non spore-forming bacteria. Current evidence indicates that remains contaminated with spore-forming bacteria can be reliably sterilized only by complete incineration. However, alternative decontamination schemes may be employed which could reduce spore burdens to levels acceptable with regard to later transmission risk.

## SECTION VI - MASS CASUALTY MANAGEMENT

### 408. Basic Care Provisions.

There will be significant differences in the methods of providing basic medical care in mass casualty situations.

**409. Facilities.**

If physical facilities have been destroyed by other means of warfare, most civilian casualties will be cared for in the home; military casualties may well be treated by unit medical personnel rather than being moved to a hospital. Unlike a typical mass casualty situation, few of these patients will require surgery.

**410. Equipment.**

For the vast majority of patients, no special equipment, such as x-ray facilities, oxygen therapy, or surgical equipment, will be needed. Biological toxins are an important exception, where dramatic, acute signs such as respiratory paralysis would necessitate various types of advanced equipment (for instance, mechanical ventilators).

**411. Level of Care.**

If the biological agent causes an illness that results in relatively few deaths (for example, Venezuelan equine encephalitis, Q fever), medical care can be effectively provided on the local level. If the disease is one for which specific therapy such as antibiotics is indicated (for example, tularaemia), instructions for obtaining and administering the drug should be disseminated. With a disease like yellow fever, with high mortality and for which no specific therapy is available, instructions for general supportive care that might be provided by non-medical personnel should be disseminated.

**412. Staggered Effect of Biological Agents.**

Although many individuals becoming ill from an attack with a biological weapon would likely present for medical evaluation over a short time span, all would not become casualties simultaneously, as they would for example, following saturation bombing or a massive surprise attack with nerve gas. An exception to this pattern might be seen following an attack with a biological toxin.

**413. Effective Duty Period.**

Those who had been infected by a biological agent could remain functional for a period of time after the attack (during the incubation period). However, a return to duty might not be advisable until an etiological diagnosis had been established.

**414. Employment of Physicians.**

It may be necessary for one physician, with a small number of ancillary personnel, to care for several hundred patients. Information could be disseminated about the normal course of the disease, the specific signs or symptoms of adverse prognostic significance, the situations requiring individual medical attention or advice, and the procedures for obtaining essential

medical supplies. This arrangement would allow a limited number of professional personnel to care for the maximum number of patients.

**415. Psychological Considerations.**

An essential aspect of medical management in such a situation would be to allay panic. This could be done effectively only if everyone in the area (both civilian and military) could be assured that the cause of the illness is known, the course of the disease could be described with reasonable accuracy, and the outcome could be predicted. This type of assurance could be provided only if an accurate etiologic diagnosis can be made shortly after the onset of illness. If this assurance cannot be provided, the psychological response might create greater problems than the disease itself.