

Abstracts of Scientific and Invited Papers

7th NATO Blood Conference

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Session 1: Blood Donor Response to the Outbreak of Natural Disasters, Terrorism, and War

Blood Supply and Demand in Disaster, Terrorism, and War

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The continuing demand for blood for transfusion reflects the necessity to supply something that has a limited shelf life.

- Natural disasters or calamities such as an area-wide flood, earthquake, or windstorm do not create an acute need for blood. The problem arises only later because collection, communication, and transportation are impeded.
- Bioterrorism events will not increase the blood need, but may incapacitate donors.
- War needs of fighters are a logistics problem that mostly can be anticipated. The effects of war on civilians can be overwhelming.
- Manmade disasters, which mankind inflicts on itself, are those that need blood. They generally occur at single point locations.

Point-event disasters result from accidental failure of man's mechanisms and technology, but also result from intentional attempts to terrorize and intimidate. They are typified by rail, road, and aircraft accidents and by fires and explosions. Injuries produced in humans are similar whether they were caused accidentally or purposefully.

The problem is the coordination of the needs of victims of manmade disasters with the willing responses from volunteer blood donors. In the United States, there have been only five disasters in 30 years that required more than 100 units of blood. Each time, all of the blood transfused already was available before the disaster began. Nevertheless, ten-fold collections were made. In a 1995 terrorist bombing with 167 killed, the wounded used 131 units; >10,000 were collected. The wounded from the huge

terrorist attack on 11 September, 2001 in which >3,000 were killed used 258 units; >500,000 were collected.

Not all disasters in all countries will fit the above predictive outline. But, other scenarios suggest similar responses.

Reference

Schmidt PJ: Blood and disaster; Supply and demand. *N Engl J Med* 2002;346:617–620.

Keywords: availability; bioterrorism; blood; collection; disasters; donors; needs; transfusions; wars

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Blood Donor Response to Continuous Terrorist Threats

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During the last three years, Israel has faced repeated terrorist attacks involving mostly the civilian population. Each Multi-Casualties Event (MCE) creates an immediate increase in the demand for blood units and components (conditional needs), required to treat the casualties. In 2000–2003, about 150 MCEs occurred, resulting in 719 individuals killed at the scene, 1,189 severely/moderately wounded, and 3,070 with minor injuries.

The responsibility for supplying blood to both the military and civilians in Israel is carried by MDA National Blood Services—a civilian, statutory, not-for-profit organization. It conducts donor recruitment campaigns, blood drives, and blood collection nationwide. Processing, testing, storage, and supply of blood units and components to 30 hospitals are executed daily, concurrently with careful monitoring of the nation's blood inventory. The country is self-sufficient as blood supply is concerned, with a steady increase in blood donations throughout the years, reaching 276,000 units in 2002 (4.6% of the Israeli population). All of the blood donors are non-remunerated volunteers. Of the 1,000 units required/day, 70% are donated by civilians and 30% by military personnel. About 85% are collected in mobile drives and 15% in MDA stations nationwide.

Blood required by the hospitals in response to MCE could result in up to 25% increase of the daily supply. These events create a spontaneous reaction from the public, resulting in a substantial increase in blood donations, in subsequent days. Public appeals were conducted only on three occasions, which were met with an impressive

response of blood donations during the hours and days following the events.

Keywords: blood; collection; components; distribution; donations; Israel; multicasualty events; processing; requirements; supplies; terrorist attacks

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Impact of War: Reflections on Blood Transfusion Services in BiH 1992–2002

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This presentation defines the basic problems with blood transfusion services in post-war Bosnia and Herzegovina. First, the pre-war context will be summarised, then the situation during the war will be identified, and finally the post-war period will be examined. Comparisons between these three periods will highlight the impact of war on the organisation and function of blood transfusion institutions and services.

We explore difficulties in: (1) Motivating blood donors; (2) Setting one strategy for the whole country; (3) Developing common standards; (4) Having a lock on legislation, (5) The education and training of personnel; (6) Developing quality management and control; (7) The financing of services and institutions; (8) Having an increase in the demand for blood and blood components, but with fewer resources and an inefficient and ineffective country-wide organisation resulting in poor management.

Keywords: blood; Bosnia-Herzegovina; components; blood; demand; donors; education; effectiveness; efficiency; financing; legislation; management; quality; resources; standards; strategies; training; transfusion services; war

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A Model of Medical Measures for Blood Transfusion Services for Mass Casualties

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All the services of a country's public health system should be capable of rendering assistance to people affected during natural or man-made disasters, war, or other large events. Adequate blood transfusions and maintenance of medical measures for large groups of the population is possible only if there is a sufficient group of specialists in blood transfusion medicine who possess methods for emergency care and methods for the use of blood and its components in extreme conditions.

Within the last several years, a model for constant readiness to provide blood transfusions has been developed, and includes the conditions required to process a large number of the donors after notification of the occurrence of a disaster. The laboratory component of the blood transfusion crew ensures control of the main specifications for clinical analysis, homeostasis, and virus safety of the donated blood. At the same time, maintenance of the blood transfusion service demands organization of medical and donor plasmapheresis, which, because of the absence of a mobile point for donor plasmapheresis, currently is not being supplied up to an adequate level. For example, an

injured person may require at least 1 liter of frozen plasma per day and 250 ml of packed red blood cells. Plasmapheresis is also necessary at the early stages of the development of acute renal failure, which may result following trauma-induced injuries.

Thus, the service of providing adequate blood transfusion services in Azerbaijan is in the formative stages (high-performance, portable, extracorporeal equipment and vehicles with centrifuges and freezers required for rapid cooling, all working on an autonomous power supply). This program is necessary for maintenance of the indispensable qualified blood transfusion service.

Keywords: analysis; blood; disasters; donors; fresh frozen plasma; plasmapheresis; processing; renal failure; safety; transfusions; trauma

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Netherlands Military Blood Supply System

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The Netherlands civilian blood supply organization—the Sanquin Blood Foundation—recruits and screens all donors, performs the donor testing and produces the usual array of blood products. The Netherlands military blood supply system is built on the civilian organization in that it procures liquid red cells, FFP, and platelets from its civilian partner. Because of long, vulnerable supply lines and unpredictable needs during missions abroad, we adopted the use of frozen blood products as developed in the United States. The lecture will address the organization and missions of the Netherlands Military Blood Bank, the use of liquid and frozen blood products, means of transportation, and quality control. This expertise was used during missions in Bosnia (SFOR) and Afghanistan (ISAF) and is now currently in use in Iraq (SFIR). Finally, some recent research and development issues will be mentioned.

Keywords: Afghanistan; blood supply; Bosnia; frozen blood products; Iraq; military; Netherlands Military Blood Bank; Sanquin Blood Foundation

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Military Support to Civil Blood Programs and vCJD Deferral

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The role of the United States Armed Services Blood Program and its support to the United States civilian blood programs is presented. The military blood program primarily is self-supporting. The major support role the Armed Services Blood Program provides access to donors on military installations to civilian blood programs. The vCJD deferral policy of volunteer blood donors of American Red Cross and that of the United States Food and Drug Administration are reviewed and contrasted including the impact on prospective donors. The vCJD donor deferral rate for the American Red Cross went from 0.06% in March 2001 to 0.88% average by the end of 2002. The rate continued to decline to 0.38% by December 2002.