prehospital stage and evacuation to a single-purpose medical centre prepared for such an event. The Siberian Centre for Disaster Medicine designed a Plan for Interterritorial Interaction for Field Disaster Medicine in Siberia which organizes the medical abilities and facilities in accordance with the scale of possible overwhelming situations. The document allows over the short term, the concentration of necessary specialty abilities and facilities of Disaster Medicine for management of the consequences of overwhelming situations in any administrative territory of Siberia.

These abilities and facilities can be addressed and included in the plan for international cooperation.

Key words: disaster medicine; specialization, Siberia, technological disasters

Prehospital Teleconsultation

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Wireless data communication opens a new era in the provision of emergency medical services outside of the hospital. With a combination of a terminal unit (laptop computer), a mobile phone, and a patient monitor, it is easy to collect, send, and receive information that is needed for the provision of emergency care. Recent inquiries indicate that paramedics need practical advice for acute problems much more often than has been assumed. Thus, there is a need to create a consultation system that readily fits into everyday working rhythm.

There has been created a teleconsultation entity in order to fulfil these information needs in emergency medical services. One of the essential parts of this entity is the analogue-to-digital converter unit for easy digitalisation of monitored data together with Windows-based software. This device collects the monitored parameters from different probes and displays these data on a computer screen in a form that can be transmitted directly to a doctor's computer screen. The doctor-in-charge will be reached easily using a data network.

This system facilitates an immediate response which is essential during the golden minutes in emergency situations. The system also archives this patient information automatically in an electronic form. The advise provided, then, is based on exact, actual data of patient's state and background, which in its visual graphic form, is much more exact than is solely verbal information provided by telephone. Written advise also is much more concertical and precise; thus, fatal misconceptions can be avoided.

The addition of this type of device results only in a nominal increase in workload, and will be accepted only if its benefit/extra effort relationship is positive. Besides the imminent obvious improvements in patient care, it offers indirect benefits in form of learning.

Key words: communication; consultation; information systems; medical consultation; paramedics; physicians; technology; teleconsultation

Retention of Vital Activity and Vitality of the Brain During Deep Hypothermia

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Cold paralysis of thermoregulation and respiration occurs in rats at the brain temperature of 18–19°C. We have restored these functions without rewarming the body by introducing EDTA into the blood of the cooled animals, which improves the transport of the excess of Ca^{2+} from the cells to the intercellular medium.[1] Spontaneous respiration and cold shivering continued until a brain temperature of 15.5–16.0°C was reached.[Ivanov, Arokina, Volkova, *in press*] During cooling of the animals, if an intensive circulation could be retained in the brain, spontaneous respiration continued until temperatures of 13–14°C were attained.[Ivanov, Slepchuk, *in press*] Upon further cooling of the brain, respiration and thermoregulation are switched off. However, if the arterial blood pressure is maintained at the level of 35–45 mmHg, the brain retains its vitality until temperatures of 1–2°C are established. However, its functions can be restored after a long period of such cooling.[Ivanov, Alyukhin, *in press*]

These observations demonstrate the yet unknown properties of the brain of homoisothermal animals. They can serve as a stimulus to develop new methods for reanimation after deep accidental hypothermia.

Key words: brain function, calcium flux; EDTA, hypothermia; preservation

Principles of Retention of the Vitality and Vital Activity During Deep Hypothermia without Rewarming the Body

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For 100 years of studying accidental hypothermia, rewarming the body was considered the only method for restoring life, though often, this also was the cause of death of a cooled organism. Supplying the brain of mammals with cooled blood at a sufficiently high arterial pressure under physiological conditions (special method) has allowed us to retain thermoregulation and spontaneous lung ventilation in animals at brain temperatures so low that they always paralyze these functions. Supplying the brain with cooled blood and artificial ventilation allowed us to retain the brain vitality in animals for a long time at the brain temperature of about 0°C; and following this period of hypothermia, we were able to restore the vital activity of an organism.

According to Hochachka's theory (1986), during deep hypothermia, the synthesis of ATP is violated. The lack of energy to the brain prevents the transfer of calcium ions

(Ca^{2+}) from the cells into the intercellular medium against a great concentration gradient. The accumulation of Ca^{2+} in the cytosol is the primary cause of the cold paralysis of cell functions.

We removed a portion of Ca^{2+} from the blood, thereby decreasing this gradient, and thus, decreased the cold threshold for the arrest of ventilation, circulation, and thermoregulation, e.g., renewed intensive firing rate of the neurons even at the skin temperature of 0°C, at which temperature they never were noted to function.

Ivanov K: *Ann New York Acad Sciences* 1997;813:32–38.

Ivanov K: *Int. Symp Therm Physiol,* Copenhagen: The August Krogh Institute 1997, 143-148.

Key words: brain function; brain temperature; calcium fluxes; cooling; hypothermia; retention of function

The Work System of the Air Ambulance in the Arkhangelsk Region

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The Arkhangelsk region is situated in the northwest of Russia. It has a territory of 578,000 square km. The population is 1,527,700 people: 75% of them live in 13 towns and 38 villages. In the region, there are 4,000 settlements with populations of 3,000–5,000 people each and these comprise 26% of the total number of persons in the region. The majority of these small settlements especially on the seaside of the White Sea and the Karsky Sea, are not connected to the big centres by highways.

In order to provide this part of population with the first aid, the air ambulance is used (plane AN-2, 12 people aboard, speed 180 kph; plane L-410, 15 people aboard, speed 350 kph; helicopter MI-8, 12 people aboard, speed 200 kph). Air ambulance bases are in Arkhangelsk, Kotlas, and Narjan-Mar where there are large hospitals. To provide this medical aid, they use different teams. At the central base in Arkhangelsk, four teams are on duty: 1) traumatologic; 2) adult surgical; 3) children surgical; and 4) therapeutic. Each team consists of 2–3 specialists. The teams have the portable equipment, sterile instruments, and medicines specific to accomplish their respective tasks.

Annually, these teams make nearly 500 flights, they perform 300–350 surgical operations, and evacuate about 800 sick or injured people from the detached districts of the region to the larger centres.

Key words: air ambulances; air-medical transportation; emergency medical services; medical aid; pediatrics; teams; trauma

The System of Medical Provision of Safety Operations on Technological Catastrophes and Disasters in the European North of Russia

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The system for the provision of medical care for the population in cases of emergency includes the combination of scientifically based principles of safety measures coupled with the evacuation of the population and forces and the means for the provision of the first medical aid. The essence of this system is in the organisation of the first medical aid given at the proper time and in strict sequence, and in the treatment of the affected people during their rescue with immediate transportation from the site of the disaster to medical institutions in accordance with the type of injuries sustained by the victims.

In Russia, a two-staged system for the provision of medical care during a disaster was adopted. Taking into consideration the main principles for the provision of first medical aid to mass casualties, some important questions must be solved: 1) medical investigation for the cause of the injuries; and 2) sorting of the affected people. The principal rules in the system for the provision of medical care to those affected are:

1) Provision of first aid and qualified medical help as soon as possible;
2) Definition of preventive measures according to the situation with thorough medical sorting between those who need first aid and those who can wait for help;
3) Composition of groups of medical services that correspond to the main needs as relate to the source of the injuries; and
4) Organization of the evacuation of the victimes away from the site of the event in preparation for the second stage of medical evacuation.

The system for the provision of medical care is one of the main and most difficult activities of health care during the post-disaster, medical relief operations.

Key words: disaster; emergency; evacuation; first-aid; medical care; rescue; safety; transportation

A New Type of Disaster

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In 1997, uncontrolled man-made forest fires in Indonesia (Kalimantan and Sumatra) involved about 310,000 hectares of forest and estates that produced a haze. In all, about 500 houses were destroyed by the fires, especially those built on pit soil. This difficult situation was probably an El Niño phenomenon. The haze period lasted from mid-July to October 1997.

Apart from Indonesian fire fighters, firefighters from Malaysia also were involved. Also, support (helicopters