

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 Inter-territorial 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

Immonen A.

Pohjois-Savo Polytechnic, School of Social and Health Care

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 advice 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 advice also is much more concisely 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

Ivanov KP

I.P. Pavlov Institute of Physiology, Russian Academy of Sciences, Saint Petersburg, Russia

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 Ca²⁺ 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

Ivanov KP

I.P. Pavlov Institute of Physiology, Russian Academy of Sciences, Saint Petersburg, Russia

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