

large fasciotomies, extensive removal of necrotic and infected soft tissue, and also removal of loose bone fragments—is necessary, but wounds always should be left open for delayed closure.

II.1 The Use of Satellite and Ground-Based Telemedicine Systems in Urgent and Emergency Health Care (Telemedicine)

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The support of emergency health care in nonurban, remote, and isolated areas always has been a challenge for health-care providers. The mainstay of such services, until recent years, has been communication by two-way radio, and, where available, the telephone. There is now a wide range of telecommunications and information technologies that can do much to bridge the gap between those needing services and providers. A number of telemedicine projects using ground-based and/or satellite technology have shown that medical resources and expertise now can be made available at acceptable costs in emergency situations and to meet routine remote health needs.

This presentation, using case studies, described telemedicine systems for urgent and emergency care, including reliable voice links, slow-scan television, tele-electrocardiography (ECG), tele-electroencephalography (EEG), tele-imaging (radiology, nuclear medicine, ultrasound), and consultations using compressed video. Satellite technology use in disaster relief, peace-keeping operations, and the support of health care in the offshore petroleum and marine industries were included.

Current and emerging low-earth-orbit satellite systems coupled with innovative geostationary satellite applications, will be described. Guidelines for telemedicine projects will be suggested.

II.2 Telemedicine in Northern Norway

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The geographical characteristics of Norway, the lack of medical expertise in rural areas, and the pattern of settling guided Norwegian Telecom Research (NTR) to initiate the Norwegian Telemedicine Project in 1988. An expert group that came into being through a close relationship between NTR and the medical experts at The University Hospital of Tromsø (UiTØ), Norway, has developed telemedical applications within many fields of medicine. Based on a broad-band network at 2 Mbps, the video conference system is the basis for a regular contact between remotely situated general practitioners and doctors at UiTØ in the fields of dermatology, otorhinolaryngology, and psychiatry. In the fields of echocardiology, radiology, and pathology, there is a regular contact between county hospitals in rural areas in the northern part of Norway and the medical experts at UiTØ.

Promising trials have been done within the fields of micro-

biology, gastroenterology, and neurosurgery. Remote teaching is used regularly to educate students in remote areas. Trials are being done for broadcasting lectures for the medical students.

The different technical solutions seems to produce satisfying results. The quality of the images from the remote medical examination has been studied and found to be good enough to secure a qualified medical diagnosis. The patients are content with being diagnosed in this way.

Payment and the laws for such services are suggested.

It is the health-care system's organization that mainly hinders capitalizing on modern communications enormous potential to provide the best for both the patients and society as a whole.

II.3 The Role of Telemedicine in Disasters

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It is well-recognized that the prompt transmission of data from the site of the disaster to emergency medical services is of paramount importance. Remote transmission of biomedical signals and, more generally, of clinical data represents the more classic application of telemedicine. In fact, it enables a first-level examination of the patient, even when he or she is not physically present at the hospital. Therefore, under the condition of an emergency, assistants can use the telemedicine systems for primary diagnostic categorization of specific pathologies, even in the absence of competent specialists.

At the top of these systems, we find teleconsulting service equipment, which, thanks to the integration of different devices, allows for a complete exchange of information between the first-aid structures and the highly specialized hospitals. However, despite the great potential of telemedicine, its regular application still is limited to a few interesting experiences. The main reason is probably the minimal competence of the health-care professional in this field, coupled with a failure in organizing research programs aimed at the use of the available means of telemedicine.

The Center for Study and Training in Telemedicine, promoted by the Telemed Consortium in Rome, is a pilot center for whoever desires to acquire specific high-level knowledge in the theory and application of telemedicine. The center organizes teaching and research programs and encourages, at a national level, all research activities related to the topic.

III.1 Chemical Disasters: Special Features (An Overview)

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In comparison with mechanical trauma or the thermal burns that result from an accident involving many victims—as can be the case in earthquakes, airplane or train crashes, fires, etc.—disas-