MEDICAL ASPECTS OF NUCLEAR ACCIDENTS

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It is a privilege to speak before this distinguished group to review my experience after the nuclear reactor disaster in the Soviet Union.

The United States leads the world in the number of nuclear power stations and in the net generation of electricity from nuclear sources; it is followed by France and the Soviet Union. These power stations are located throughout the world and contribute a substantial percentage of the electricity generated. The United States obtains 16% of its electricity from nuclear power. Much of western Europe is heavily dependent on nuclear power. The Soviet Union generates 11% of its electricity from nuclear sources; this proportion is much higher in the Ukraine and represents a substantial proportion of the electricity export of the Soviet Union to eastern Europe.

These data clearly indicate that nuclear energy is a reality and the world is likely to require it for the next 50 to 100 years. Much of the world's population, about 70%, does not have adequate power. Many countries will rely on the development of nuclear energy in the next several decades. We in the United States are fortunate to have alternative energy sources or fiscal resources that much of the world does not. Because of this, we could probably avoid nuclear power if we chose to. However, recent events at Chernobyl indicate that nuclear energy-related emergencies are international or transcountry by nature. Even if the United States were to close its nuclear power stations tomorrow, it would not obviate the need to develop appropriate planning for nuclear emergencies.

THE CHERNOBYL ACCIDENT

Most people had not heard of Chernobyl before April 26, 1986. For orientation, the city of Kiev, with 2.6 million persons, is located 130 km southeast of Pripyat, the site of the Chernobyl nuclear power station. The Pripyat river adjacent to the power station flows into the Kiev reservoir, which supplies about one-third of the drinking water for the city of Kiev. The station has graphite-modulated reactors approximately 12 m in diameter and 7 m high.

The operating principles of RBMK reactors, such as those at Chernobyl, are straightforward. Cold water enters the reactor core and is boiled by the heat released by fission of uranium 235, steam and boiling water are separated, and the steam is then used to drive

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