Disaster Medicine

Organizational aspects of disaster preparedness and response

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Veterinarians who may become involved in the organized response to any disaster or emergency must understand the basic concepts and components of the ICS. The ICS is the functional field organization and management unit of the NIMS and provides for coordination of personnel, equipment, and other resources at the scene of a disaster. The NIMS is a part of the NRP dictated by HSPD-5 (management of domestic incidents). The NRP provides a method for making federal assistance available, when requested, in those instances when state and local response efforts are overwhelmed.[1] Other provisions of the NIMS include coordination of the many agencies involved in any disaster response, training and certification of personnel for specific activities, and classification and management of resources. In addition to creation of the NIMS, the NRP assigns and coordinates various roles and responsibilities during disaster responses and provides specific plans, called *annexes*, for emergency support functions, other support functions, and specific types of incidents.

The NRP

The NRP is a large undertaking dictated by HSPD-5 and assigned to the US Department of Homeland Security. Its intent is to provide a structure for the prevention of, response to, and recovery from an incident of any size caused by any natural disaster or the accidental or intentional dissemination of any chemical, biological, radiologic, nuclear, or explosive agent. The NRP includes the development of specific assignments for local, state, tribal, federal, and nongovernmental organizations; coordination of response groups through implementation of the NIMS; and detailed annexes to provide more specific plans for response.

One of the most important principles of the NRP is that the response to any individual incident will expand or contract as necessary, according to the size and scope of the incident. Thus, if a local emergency operations center is capable of managing a particular incident, then neither the state nor the federal government need be involved. For this reason, each of the individual states is expected to plan for and respond to incidents within their scale of emergency operations. The NRP provides coordination of federal assistance, when requested, in response to incidents that overwhelm local and state resources and incidents that occur on a national scale.

Annexes of the NRP that are of potential interest to veterinarians include ESF-11 (agriculture and natural resources), which is coordinated by the USDA; ESF-8 (public health and medical services), which incorporates the National Disaster Medical System; ESF-9 (urban search and rescue); the science and technology support annex and the safety and health support annex; and all of the incident annexes, especially the biological incidents annex and the food and agriculture incidents annex.[2]

Abbreviations

ICS	Incident Command System
NIMS	National Incident Management System
NRP	National Response Plan
HSPD	Homeland Security Presidential Directive
ESF	Emergency support function

Veterinarians are particularly important to ESF-11 because it instructs the USDA to detect and respond to dangerous diseases in animals, including the destruction or contamination of animals, plants, buildings, equipment, and soil.[3] Toward this end, the National Animal Health Emergency Management System and attendant guidelines are being developed by the Veterinary Services division of APHIS. The USDA also coordinates animal, veterinary, and wildlife concerns related to ESF-8. Hence, veterinarians have potential roles in disaster response through employment at the USDA, federal accreditation, membership in the National Animal Health Emergency Response Corps,[4] and membership on the Veterinary Medical Assistance Teams.[5,6]

The public health and medical services annex (ESF-8) of the NRP has roles for veterinarians beyond those in public health. It calls for the US Department of Health and Human Services, as the primary agency, to work in coordination with the FDA and USDA to ensure the safety and security of food and food facilities. This part of the NRP also calls for the USDA, as a support agency, to assist in the control of zoonotic and economically devastating animal diseases in coordination with ESF-11. The American Red Cross, also named as a support agency, is directed to refer all issues of animal health, safety, and welfare to AVMA contacts on a local, state, or national level.[7] This is an important role for the Veterinary Medical Assistance Teams organized by the AVMA.[5,6]

The NIMS

In addition to specifying that the ICS be used as the cornerstone of any organized disaster response, the NIMS provides details regarding interagency coordination. Federal resources are managed in the field by a

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unified command in a joint field office, analogous to and working with local and state emergency operations centers. In incidents of terrorist origin, the Federal Bureau of Investigation is the lead organization and, thus, is obviously an important part of the joint field office. Large disasters result in the activation of regional coordination centers, and still larger (national) incidents result in the activation of a coordination center at the US Department of Homeland Security.

One of the most important parts of disaster preparedness and of the NIMS is the classification of resources, including equipment and personnel. Having an accurate and specific list of available resources prepared in advance of any emergency allows the incident management staff to act quickly and efficiently. For instance, a wide variety of spraying equipment and disinfectants should be available for decontamination, but the size and type of sprayer required for any particular situation must be specified. For instance, a handheld garden sprayer would be relatively useless for disinfecting large vehicles, where a 500-gallon power sprayer would be required. Such misunderstandings have occurred when resources were not clearly identified or cataloged in detail.

Personnel must be trained and credentialed to perform specific skilled and dangerous tasks, and the NIMS provides for this as a part of resource identification and management. Veterinarians and veterinary technicians should recognize that they must be identified according to their training and skills, as not all are equally capable in all areas of emergency response. Also, the US Department of Homeland Security has established that emergency responders must be credentialed and must carry photographic identification. Thus, as a first step in an initiative aimed at identifying veterinary first-responders in each county, Tennessee has trained and certified about 600 people.[8] Their system for training and credentialing animal care workers is serving as a model for other states and federal agencies.

The ICS

The ICS, also called the Incident Management System, grew out of necessity in fighting wildfires, and the Forest Service and others so involved remain the most experienced in using the ICS owing to their yearly real-life exercises. Some branches (air operations) and divisions (air tanker coordinator) underscore this heritage of the ICS. In fact, online training material may be found on the National Wildfire Coordinating Group Web site,[9] although ICS courses specifically oriented toward veterinarians and others in the agricultural response community are available. Occupational Safety and Health Administration regulations, as well as the NIMS, require the use of the ICS in responding to hazardous materials, including potentially dangerous biological agents. It may also be used to manage small incidents or planned events (eg, conventions and parades). The hallmark of the ICS is a well-defined organizational plan (**Figure 1**).

Establishment of command—During any incident, command is established by the highest ranking or most qualified (in terms of ICS training and experience) authority in the jurisdiction. Theoretically, the first person who responds to an incident is the incident commander until more responders arrive and establish the structure of the ICS organization. Transfer of authority of the incident commander and other personnel occurs when more qualified personnel arrive, if the nature of the incident changes (eg, a change in jurisdiction), or as a result of normal turnover during prolonged incidents.[9] The ICS expands to a unified command representing multiple agencies when the incident becomes so large as to require the assistance of those with different jurisdictional and functional responsibilities, allowing these agencies to interact efficiently.

Unity of command and span of control—The structure of the ICS provides an efficient and clear chain of command, so that each person is directed by and answers to only 1 person. A supervisory role over < 3 subordinates might be inefficient, and a supervisory role over > 7 subordinates could be unmanageable. Thus, the supervisor-to-subordinate ratio may vary from 1:3 to 1:7, but the ideal is 1:5.

Flexibility of response—The response to an incident expands and contracts in modular fashion to meet the requirements for managing the incident.[10] Organizational elements are activated and demobilized according to the operational plan. A small incident may require only a small number of responders. However, the person at the top of any element of the system (or the entire system) is responsible for all activities within that element until authority for specific functions is delegated. Therefore, large and complex incidents require several layers of authority, which may expand to involve many people in the hierarchy of the organization.

There are 6 primary management functions that may be activated as part of the ICS.[9,10] Incident command establishes objectives and priorities and may activate subordinate sections for additional functions as needed, but bears responsibility regardless of delegation of authority. The planning section develops a plan for each operational period to meet established objectives and monitors the status of resources. As an example, the planning section for a veterinary incident might include animal welfare or epidemiology. The logistics section provides the resources, services, and support necessary for the execution of the plan, such as, for example, a procurement unit to obtain medical supplies. The operations section develops and conducts the tactics to execute the plan; divisions in the operations section responding to a biological incident might include surveillance or vaccination. The administration and finance section provides personnel and accounting services, among others. An intelligence section may be activated, if necessary, to gather and analyze information from outside ICS communications, or these responsibilities may be assigned instead to a command staff officer, a branch in the operations section, or a unit in the planning section. The head of each section is called the chief of the section, and these section chiefs collectively comprise the general staff and answer directly to the incident commander (Figure 1).

The command staff is composed of 3 or 4 officers who serve directly beneath the incident commander.

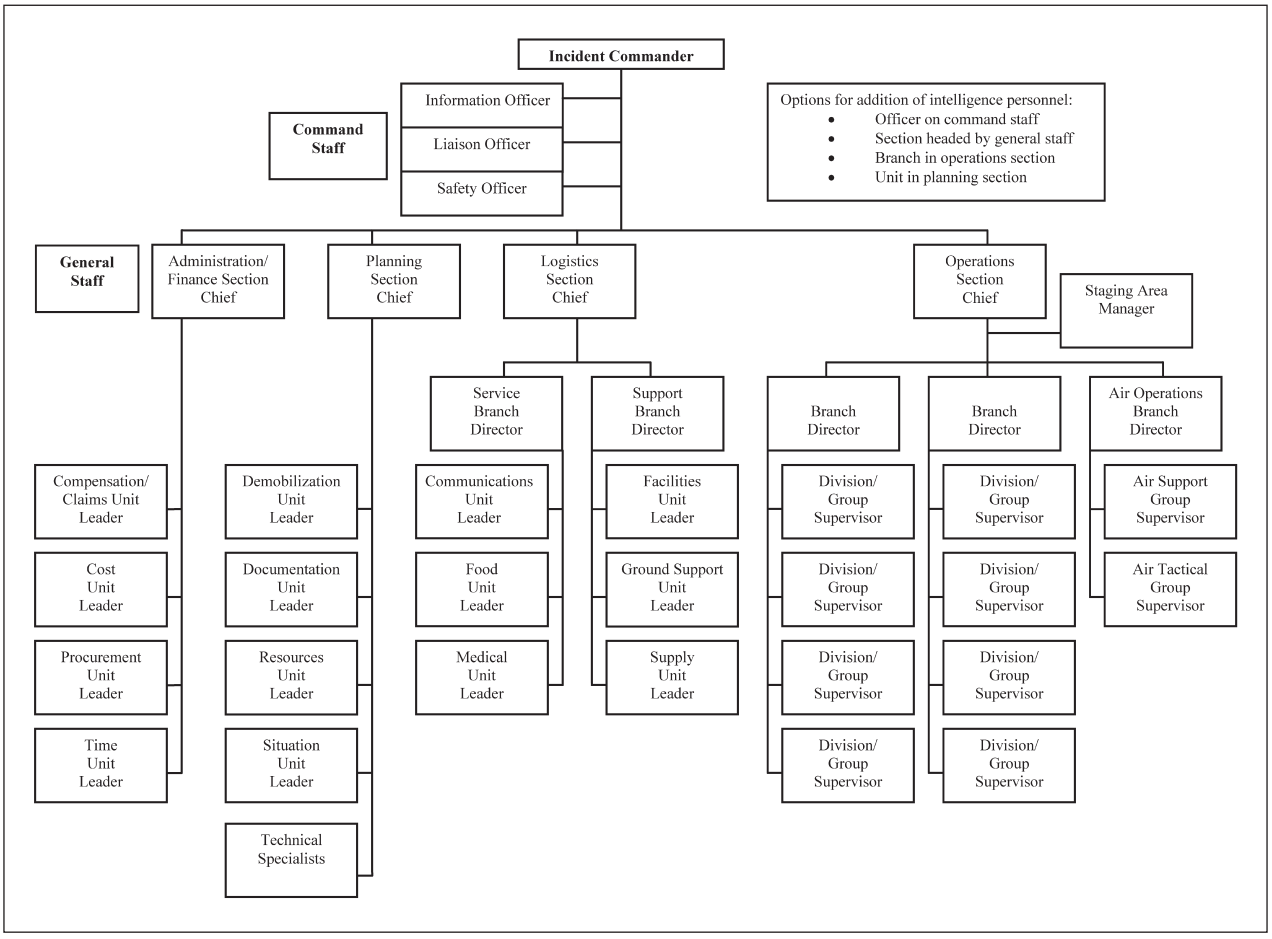

Figure 1—Illustration of the organizational makeup of the ICS. The structure provides a clear chain of command so that each person is directed by and answers to only 1 person. The response to an incident expands and contracts in modular fashion as organizational elements are activated and demobilized according to the requirements of the operational plan.

The information officer manages public relations and press communications. The liaison officer arranges coordination and cooperation of agencies and other organizations assisting in the effort. The safety officer oversees the minimization of risks to health and safety primarily through enforcement of compliance with applicable regulations, rules, and guidelines.

Incident action plan and the operational period—Forms have been developed to aid in the preparation of plans for emergency response. The action plan is initiated by establishing incident objectives and includes a description of the elements of the ICS that will be used, along with their tactics and resource assignments. The operational period is integrally related to the action plan, as it is the amount of time required to complete it. The objectives of the plan should be refined to the degree that the operational period is relatively short, being sometimes as little as a few hours, often about 12 hours, and seldom if ever > 24 hours.[9]

Integrated communication, clear text, and common terminology—A communications unit exists within the service branch of the logistics section (if the ICS is expanded to that degree) to provide for interoperability or interconnection of communications, including equipment, software, and methodology for voice or data transfer. The communications unit leader also is responsible for an effective communications plan for each operational period. Radio codes and other jargon should be avoided, to the degree possible, opting instead for clear text consisting of plain and simple terms that all responders may understand. Common or uniform terminology, particularly in reference to the structure of the ICS, aids in understanding one's place in the system. Hence, a section serves each of the primary functions of the system, and each section is headed by a chief. No other elements are headed by a chief, so anyone involved with the system knows the inherent rank associated with the title. Branches, if necessary and activated, are headed by directors. The functional units in the administration, planning, and logistics sections are headed by leaders, but their equivalents in the operations section are called divisions or groups and are headed by supervisors, to identify their unique presence in this section.[9]

If additional manpower is required, the head of an element of the organization may be assigned 1 or more aides with particular titles. The incident commander, section chiefs, and branch directors may, for instance, be assigned deputies. Aides to the command staff officers are called assistants. The heads of lower-level elements of the ICS are not expected to require assistants.[9]

Resources management—Resources are categorized and assigned as a single resource, a strike team, or a task force. A single resource is the smallest functional assemblage of people and equipment capable of any given task (eg, a fire engine company). A strike team is a specified number of the same type of single resources and has its own supervisor and communications. A task force, on the other hand, is a group of different types of single resources, but also with its own supervisor and communications, that is assembled for certain assignments. Under certain circumstances, veterinarians and veterinary technicians may serve as single resources or on strike teams or task forces. For example, the State Animal Response Teams[11,12] and Veterinary Medical Assistance Teams[5,6] are typically task forces with single resources for specific task force activities, such as animal search and rescue, emergency animal shelter management, and veterinary care. When activated, the resources unit in the planning section is responsible for listing the status of all resources as assigned, available, or out of service.[9]

The nature of the ICS requires that resources be categorized and typed, and if these resources are skilled personnel, then they must also be certified and acknowledged on rosters or lists. For example, veterinary personnel who responded in the aftermath of the hurricanes that struck the United States during 2005 in preorganized teams were efficiently integrated into the response efforts. Others who self-deployed or arrived unannounced and without credentials were used inefficiently if at all. They were a burden on the system, in that additional bureaucracy was required for management of these unexpected volunteers. Thus, veterinarians and veterinary technicians should recognize the need for identification of and advanced planning for their role in the ICS.

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