Curricular and pedagogic questions raised by recent medical education efforts on bioterrorism

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This article outlines the development of learning materials to educate osteopathic medical students about biological terrorism at the American Association of Colleges of Osteopathic Medicine (AACOM). The author then poses two questions that arose from this and concurrent AACOM projects and new technologic developments in medical education, regarding what colleges of osteopathic medicine teach and how they teach it.

(Key words: anthrax, biological terrorism, biological warfare, biological weapon, bioterrorism, epidemiology, learning objects, osteopathic medicine, prevention, web-based learning)

Most Americans affirm that the events and implications of September 11, 2001, changed their lives in fundamental ways. For medical educators, September 11 also raised serious questions about the way colleges educate the nation's future physicians. In December 2001, the Agency for Healthcare Research and Quality1 noted, “Until recently, the public and private healthcare sectors have been largely excluded from the nation’s bioterrorism preparatory efforts. The very group that would handle the consequences of an attack has yet to receive widespread education on the topic.” McFee2 further notes, “The current generation of health care professionals, especially community clinicians who may be among the first to identify potential bioweapons victims, remain inadequately prepared to address such events.”

This article outlines the development of learning materials at the American Association of Colleges of Osteopathic Medicine (AACOM) to educate osteopathic medical students about biological terrorism. Based on these discussions at AACOM, my work there on several concurrent projects, and new technologic developments in medical education, I pose two larger questions for osteopathic medical education.

Educational responses

Such frank acknowledgments of a fundamental lack of preparedness on the part of physicians across the United States led to a number of immediate responses from the medical education community. Joint meetings were held in the months after September 11, 2001, bringing together the leaders of healthcare associations and their counterparts in medical education.

These meetings frequently resulted in the rapid dissemination of information on the worldwide Web, providing educational and “just in time” information for practicing professionals (Figure). Representative among such Web sites are those hosted by the American Osteopathic Association, the Office of the Secretary of Defense, and the US Department of Health and Human Services. Medical educators have also considered what preparation should occur during a medical student’s educational experience, initiating courses, seminars, and mock training experiences.3

In a notable study published in December 2001, The Johns Hopkins University Evidence-based Practice Center, as a contractor institution on behalf of the Agency for Healthcare Research and Quality,1 attempted to identify the most effective methods for training clinicians to respond to acts of biological terrorism by identifying and reviewing 60 unique studies that were published before June 2001 and met the eligibility criteria established by the Center, including

- the ability to rapidly identify unusual disease syndromes, to contact public health officials, and to communicate with disease control agencies as well as other health professionals. The relevant public health events considered in this report were infectious disease outbreaks, toxidromes or mass poisonings, catastrophic events that incite public fear, and events that call for use of hospital disaster plans.

The report reflected the difficulty in synthesizing best practices across studies because of the extreme heterogeneity of the objectives, settings, targeted clinicians, and methods. The final report concludes that before September 2001, there was a "lack of strong published evidence about how to train clinicians for bioterrorism preparedness."1

The response from the American Association of Colleges of Osteopathic Medicine

In response to this clear need, the American Association of Colleges of Osteopathic Medicine (AACOM) is working with the Association of American Medical Colleges to establish

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Readers are invited to participate in a discussion of the topics addressed in this article on the American Association of Colleges of Osteopathic Medicine's listserv, The Osteopathic Medical Education E-mail List, at http://www.aacom.org/education/listserv.html.

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learning objectives and materials that will provide guidance to all 146 medical schools in the United States as they struggle to provide up-to-date preparedness training for their students.

Further, AACOM formed a task force to prepare a learning module that will provide a framework within which future physicians can anticipate and respond to acts of terrorism. This tool will be delivered to the colleges of osteopathic medicine (COMs) in a flexible Web-based format. The colleges will be encouraged to use the provided assessment tool to gather and share pretest and posttest evaluation data to assess the effectiveness of the learning materials AACOM provides as applied in the specific modality chosen by the COM.

The learning module identifies the behaviors demonstrated by a physicians’ “heightened awareness” to protect his or her own safety, as well as that of his or her family, practice, and community. It also provides guidelines for appropriate communications within the two main scenarios discussed: (1) the command-and-control structure used in mass-casualty events (eg, September 11, 2001), and (2) the public health linkages established for biological attacks (eg, fall 2001 anthrax attacks). The module covers the following topic areas:

- basic orientation to weapons of mass destruction,
- protocols for heightened awareness,
- public health and community response,
- risk communication, and
- public policy.

The goal of this learning module is to empower future physicians by making the information presented specific and adaptable to any practice environment. The public policy section of the module acknowledges the importance of the role of physician-advocates as both federal and state governments determine appropriate regulatory powers in the event of such attacks.

**Further questions**

The AACOM preparation of learning materials that would counter the effects of biological terrorism and would remain current, appropriate to the public need, and deliverable in a “flexible” environment leads me to pose two broader questions for osteopathic medical education:

- How can osteopathic medical education provide an appropriate balance between individual patient health in the more prevalent disease orientation and public health in an epidemiologic orientation?
- How can educational materials in the ever-growing and changing arena of medical knowledge and clinical application be prepared to provide timely information in flexible formats to serve all COMs, each with its own diverse curricular modules and technologic capabilities?

The remainder of this article addresses each of these concerns.

**Post-September 11: A new curricular focus for osteopathic medical education**

Perhaps in spite of the “lessons learned” after the anthrax bioterrorist attacks in 2001, recent misunderstandings and confusion between the press and public health officials regarding preparedness measures for a potential smallpox attack have called further attention to a fundamental lack of communication between the medical community and the public in the United States. Many healthcare workers and medical educators believe that including learning materials related to biological terrorism preparedness in medical curriculums should be only the first step in moving medical education from a disease-oriented perspective that focuses on individual patients to the inclusion of an epidemiologic/community perspective. As Ronald R. Blanck, DO, President of the University of North Texas Health Sciences Center at Fort Worth Texas-College of Osteopathic Medicine and Former Surgeon General of the Army, noted in a 2001 editorial, “[B]ioterrorism is not so much an infectious disease issue as it is a public health issue,” adding that “the silver lining of the [fall 2001] anthrax attack[s] and the increased recognition of [the threats of] bioterrorism is the increased focus on public health [systems].” Blanck further notes,

[A public health] infrastructure...that provides surveillance, education, and identification of risk factors, would not only have...prepared us to deal with [the anthrax] threat, it would also move us in the direction we need to go for future, [unanticipated] health [concerns]... We are spending so much on disease care that little is left to invest in preventive, population-based care.

Perhaps it is time that osteopathic medical educators consider a parallel proposition: our historic roots in preventive care. In this vein, perhaps we should place population-based care on an equal footing with individual patient care in our educational programs. Some COMs have moved in this direction with their focus on regional and state population health issues.

With the growing ability to gather and analyze data about healthcare outcomes, are COMs ready to provide the necessary leadership role by taking evidence-based medicine one step further? That is, are today’s COMs prepared to teach students how to use outcomes data to improve the health of the community as well as that of their individual patients? Would such a step, as Blanck and others have suggested, ultimately lead to better health outcomes and more cost-effective medical care?
Shared learning objects for osteopathic medical education?

The varied curricular models, pedagogic approaches, and technological capabilities of COMs made finding the most usable format for the biological terrorism module a significant challenge. Therefore AACOM decided to provide the module in a flexible, Web-based format that could be used in a variety of contexts.

This format further allows for the development of a framework within which COMs can identify common curricular needs and perhaps work with or through AACOM to prepare and share digitized “learning objects” that are effective applications of learning theory and consistent with developing industry standards. Learning objects are defined by Chitwood et al7 as “self-contained, reusable, high-quality learning chunks that can be combined and recombined in courses, learning activities and experiences, and assessments that meet a learner’s immediate needs.” Each COM could then use these learning objects in ways that are most supportive of their curricular objectives and formats.

Wiley® suggests that because of technologic innovations, “the Internet is poised to bring about a paradigm shift in the way people learn. Consequently, a major change may also be coming in the way educational materials are designed, developed, and delivered to those who wish to learn.” In The Instructional Use of Learning Objects (see http://www.reusability.org/read/), Wiley et al (1) define the importance of digitized learning objects as the basis for developing learning materials, (2) describe current efforts to provide industry standards for the creation of learning objects, (3) make the important connection between learning objects and instructional design theory, and (4) describe the use of learning objects to design learning systems and personalize the learning process. Wiley® asserts that “learning objects seem poised to become the instructional technology of online learning.”

Are we approaching a time when COMs would find increased value and urgency in developing a shared system of learning objects that could enhance and personalize student learning, reduce redundancy of effort, reduce costs, and provide dynamically updated information? The basis for such coordination is already established in that all COMs have made significant strides in the use of technology and connectivity to significantly change the way that their students learn.

The Instructional Use of Learning Objects includes two instructive chapters that provide guidance for this level of coordination of learning objects. Chitwood et al6 describe the development of the Wisc-OnLine: Wisconsin OnLine Resource Center Learning Objects Project (see http://www.wisc-online.com) in which project staff coordinated faculty “from 16 very different districts across the state, overcame legal hurdles, overcame communication issues, and dealt with technology [that] is changing every day” to develop a shared system of learning objects. South and Monson® describe a theoretical framework for establishing a university-wide system for creating, capturing, and delivering learning objects, also focusing on the particular role and benefits of learning objects as the basic unit of the system. South and Monson® state,

“Without learning objects at the center of the design, most of the problems we [were] trying to address [eg, distance learners, multiple learning environments, rising development costs, redundant effort, expensive low-impact innovation, and complex media management] would remain relatively unaffected....[and we would have done] little to address cost-effectiveness.

Comment

September 11, 2001, pushed important questions to the forefront for medical educators. In the context of a larger medical education response to current and evolving needs in health care, this article challenges educators to consider two essential curricular and pedagogic questions:

1. Should COMs recommit to osteopathic medicine’s historic focus on prevention by finding a curricular balance between traditional, individualized disease-oriented care and population-based, community care?

2. Should COMs coordinate efforts to build a shared system of flexible and up-to-date learning objects?

References


