Backstopping researchers' safety

Bruce Backus handles everything from routine questions to earthquake and flood plans

Bruce Backus and his staff draw most attention when, laden with equipment, they're rushing down a corridor to the scene of a chemical spill or an emergency indoor air quality response. But dealing with emergencies is a small part of the Environmental Health and Safety Office's (EHS) job.

Most of the 200 calls and e-mails that come in on an average day are more mundane - questions about complying with government regulations or requests for hazardous-waste pickup. Backus, the director of EHS in the School of Medicine, wants his staff of 32 to stay in close touch with labs because he believes that cooperation is the way to avoid violations and accidents.

"We're not the police," Backus said. "We're partners with the researchers."

The faculty welcomes this approach. "Providing a safe working environment is the right thing to do, and Bruce helps us do it. He is knowledgeable and practical, a rare combination," said James R. Schreiber, M.D., the Elaine and Mitchell Yanow Professor of Obstetrics and Gynecology.

Backus' interest in medicine can be traced to his father, a pediatric neurologist. He was serving in the Navy at the time of Backus' birth, and the family traveled with him to such faraway postings as Taipei.

"There are pictures of me toddling down a dirt road with a water buffalo in the background, but I was too young to remember any of it," Backus said with a smile.

When his father left the service, the family returned to the United States, settling first in Illinois, then in Minnesota.

Like many boys growing up in the 1960s, Backus followed the space race avidly and built telescopes and model rockets.

"I liked to try to figure out how things worked," he said. Once he took apart his father's pocket watch. "Unfortunately, there were a few pieces left over after I put it back together," he noted dryly.
Chemistry and biology were his favorite subjects in high school, and he majored in chemistry at college. After earning a bachelor's degree, Backus went to work in agricultural engineering. Dealing with wastewater caused him to think about the dangers of pollution in a crowded world.

"The increase in population and the waste we generate is the basis of many of our environmental problems," Backus said.

His employer supported Backus' pursuing a master's degree in chemical engineering while he continued to work full-time. After graduation, Backus was undecided as to whether go into biotechnology or the environmental field. The opportunity to work with Fay Thompson, Ph.D., CIH, a leader in the environmental health and safety field, led him down the environmental path.

In 1988, he joined Thompson at the Department of Environmental Health and Safety at the University of Minnesota, which was responsible for all five university campuses. Ten years later, he came to Washington University's medical school.

His work here has won high praise from fellow administrators.

"Bruce has a unique ability to discern the needs of faculty, understand the regulatory issues and deploy his staff and resources to provide a safe, healthy environment," said Denise A. McCartney, associate vice chancellor for research.

Walter W. Davis Jr., assistant dean and chief facilities officer, said, "Bruce is establishing, without question, one of the premier environmental health and safety programs in the nation, if not the world."

This sentiment is echoed by experts outside the University.

"Bruce is an enormously talented environmental health and safety professional," said Emmett Barkley, Ph.D., director of Laboratory Safety for the Howard Hughes Medical Institute. "Washington University School of Medicine is fortunate to have him leading its environmental health and safety program. He is an advocate of science whose visions are not limited by regulatory compliance objectives."

Responding to emergencies is the office's most pressing responsibility, and Backus has members of his staff on duty around the clock. They have dealt with chemical spills, radioactive material spills and even a fire in an operating room. In addition to acting as liaison between University protective services and city emergency workers, they often go to the scene to clear the area or help the injured. At the scene of a chemical spill, they may put on "moon suits" to perform a cleanup.

Calls complaining about an odor may not seem as dramatic, but Backus takes any threat to indoor air quality seriously.

"First we want to know what's causing the odor and is it a health hazard," Backus said. "Then we find out where it's coming from."

To answer the first question, EHS staffers use not just their noses but an array of monitoring equipment, including devices that can identify particular chemicals in the air. Tracking the smell to its source often calls for old-fashioned detective work.

In one case, reports of a smell of gas in one lab had EHS workers looking all over the plumbing chases and into basement tunnels, and they finally found a gas pipe that a contractor had cut and failed to reseal. Other cases have
called for diplomacy rather than detective work. When a lab complains about fumes coming from construction work, or one lab complains about the chemicals another is using, Backus' people often act as mediators.

EHS collects all hazardous waste for the medical school. This includes some 330,000 pounds of chemical and infectious waste annually and items such as refrigerators, computers and more than 5,000 pounds of fluorescent light tubes and bulbs. Complex federal, state and local regulations govern recycling or disposal of this waste, which are rigorously enforced.

Inspectors from the Environmental Protection Agency (EPA) and the Missouri Department of Natural Resources may make an unannounced visit any time, and they typically begin by checking trash cans, sewer drains and loading docks for dumping. If they don't find any - they never have at the medical school - they go to Backus' office and announce that they are going to inspect labs.

Backus and his staff see to it that the labs are always ready. They hold regular training sessions with lab workers and do inspections of their own, pointing out potential trouble spots, making sure paperwork is in order and checking labels on bottles of chemicals for accuracy. Mistakes have brought fines of $1,000 per bottle at other universities.

In his rare quiet moments, Backus gets to sit back and contemplate disaster. He is the medical school's point man for figuring out what to do in the event of a bioterrorism strike, earthquake, flood or other calamity.

"We have plans in place," he said. "Our priority is to support the hospitals, but we must also ensure the safety of medical school people and protection of our research and teaching programs."

Backus and his family live in Kirkwood. His wife, Liz, a former real estate analyst, has a journalism degree. Currently, she is a volunteer teacher and an activities leader at church and schools their three children attend. On weekends, the family enjoys outings to such destinations as the Magic House and Elephant Rock State Park. The Backus children are also fascinated with model rockets, like dad.

His scientific curiosity, which has widened with the years, serves him well in a job that calls for him to grasp many diverse research projects.

"Bruce was one of the first people here to see the experimental and clinical potential of our work on protein transduction and that enabled him to make sure the safety issues were covered," said Steven F. Dowdy, Ph.D., assistant professor of pathology.

But Backus' fascination with the medical research going on at the University goes far beyond the requirements of his job.

"This is a world-class institution," Backus said. "I get caught up in the excitement."