were all operating with huge knots in our stomachs. It was a mixture of rage and fear."

Dr. Jesus Medina, chairman of the OU Health Sciences Center's Department of Otorhinolaryngology, describes the days he spent caring for victims of the April 19, 1995, Alfred P. Murrah Federal Building bombing. His opinion is shared by virtually all OUHSC faculty, staff, and students, many of whom suffered personal loss or injury. Although the initial crisis has subsided, most have found that their lives—and their careers—have been altered forever.

With its campus located a mere six blocks from the bombing site, few OUHSC personnel remained uninvolved in rescue and relief efforts. Yet out of the rage and fear emanating from the bombing has emerged a unique opportunity for literally dozens of faculty and students. In departments across the campus, collaborative research is under way—research that will provide cutting-edge information about everything from hearing/acoustic trauma to children's mental health to new ways of predicting where to locate the survivors of a building explosion.

The collaborations cover the spectrum—the OUHSC and the State Health Department, OU and the State Department of Mental Health and Substance Abuse Services, OU and the federal government, OU and other universities, OU and private industry. All are dedicated to the same goal: if such a tragedy occurs again in the United States or the world, OU experts will be the ones to call.

"Since we are the ones who experienced this event, we are almost obligated to do this (research) and learn all we can," sums up Dr. Betty Pfefferbaum, professor and head of the OUHSC's Child Psychiatry Division. "I don't think we have any choice, and we will be in a position to assist..."
others if and when the next terrorist act occurs.

"From a psychiatric vantage point, there are implications for non-terrorist acts as well. The bombing can be seen as an extreme example of other types of violence and crime in our society, and it begs our attention." She adds an opinion expressed by many OU and OUHSC faculty: "I think the University of Oklahoma could become a major center for the study of violence and trauma, and I strongly believe we should develop this effort."

Among the key research projects stemming from the bombing are:

**What Are the Kids Telling Us?**

"I really want you to cheer up and get much better. And at least you didn't lose America."

"Just please trust in God, he will always be there for you. Don't blame God (sic), he has your friends and family and is taking good care of them. The people you loved are looking down at you and asking you not to cry. They say carry on . . . it will be all right."

"We might be young, but if you need us we're there."

"The guys who did this bomb should be in prison forever, and I would like to poke their eyeballs out."

These are but a few of the messages that plastered the walls at the Children's Hospital of Oklahoma in the wake of the bombing—in the form of more than 60,000 cards and letters sent by schoolchildren across the United States. The Gift Analysis Project, another first-of-its-kind study at OUHSC, is seeking to analyze the messages behind the children's letters and gain insights into how children react to traumatic events such as the bombing. The study is a collaborative project between the OU College of Nursing and OUHSC's Emotional Health Center and is being funded by the Masonic Charities of Oklahoma.

"This event was literally one of those things that went into living rooms around the world, and the children expressed this on a very personal level through their letters," says Dr. Ruth Seideman, project coordinator and professor of nursing. "The medium of art is especially good for young children who can't express their feelings as well, so we hoped to use this study to gain insight into how children process information on something that's bad, tragic and unfair."

To date, study participants have cataloged a randomly selected sample size of 1,027 letters and cards. The messages came from kindergartners through late teens, but the bulk was from children in third through fifth grades. The material has been analyzed by age, theme, the type of group sending the letters (school, family, church, etc.) and various other criteria. The process takes about an hour for six letters, and the study team has included OUHSC nurses, psychologists, nurses from Children's Hospital, an art therapist and an anthropologist.

"We are trying to be very careful and not read too much into the cards and letters, since we can't talk with the children about their artwork," Seideman says. "'Why?' was, of course, the biggest question posed by all the letter-writers, but what we were pleased to find was that 'hope' also was one of the most popular themes. For the volunteers on our project, this has been very healing to see all these expressions of hope and love coming from children of all ages."

Seideman will be presenting results of her research at professional meetings during the next year. "Long term, I would like to see us develop information that would be helpful to parents and others who work with children in understanding their feelings better and in guiding activities to help children cope with disasters in their environment," she concludes. "All this has taught me that children think and absorb more than we realize—even those of us who have worked with children throughout our careers."

**Do You Hear What I Hear?**

Drs. Luann VanCarnpen and J. Michael Dennis of the Department of Otorhinolaryngology are spearheading a multi-center study of acoustic (hearing) trauma and balance disorders following up individuals who were in or adjacent to the bombing site. The study includes those who have experienced hearing changes, ear ringing, dizziness and balance difficulties, with a control group of those who were near the explosion but have not noticed any apparent hearing damage. Continued
"We have seen a full range of patients from ages 4 through 76 with permanent and temporary hearing loss, permanent and temporary balance problems, and several who surprisingly were just fine," Dennis says. "Out of 85 participants, one-fourth are dizzy or have some sort of balance problem, and 64 have other hearing and acoustic trauma-related conditions."

The study is the first to look at victims of such trauma using state-of-the-art tests and technology not previously available. "For example," VanCampen says, "we are testing hearing loss at the very high frequency range, up to 20,000 Hertz, as opposed to earlier research which only tested to 8,000 Hertz. We are finding lots of this high-frequency hearing loss in the bombing victims, and while it’s not hearing and balance," Dennis adds.

Previous studies focused on hearing and hearing loss; ours is the first of its nature to so completely evaluate balance function as well as hearing."

The study is following bombing victims for one year after the event and is a collaborative effort between the OUHSC’s Department of Otolaryngology, the Hough Ear Institute, the Oklahoma City Clinic and the Saint’s Hearing and Balance Center. Dennis and VanCampen will present preliminary findings to the American Academy of Audiology and the Oklahoma Academy of Otolaryngology in April and final results at the annual National Academy of Otolaryngology-Head and Neck Surgery in Washington, D.C., this September.

"We have learned that out of the entire body, the ear is the single most sensitive to blast injuries because it is the most sensitive to air pressure changes."

that big a problem in everyday life, it is often tied to vague hearing complaints."

In addition, the study is utilizing a new test that analyzes the physiology of the inner ear on the cellular level—again providing a new level of information.

In the long term, the study results are expected to help physicians predict hearing loss for future patients exposed to explosions or other acoustic trauma. "We have learned that out of the entire body, the ear is the single most sensitive to blast injuries because it is the most sensitive to air pressure changes," VanCampen says. "Our work here is helping us to get an idea of the sequence of events with this type of trauma. Clinically, we hope to get some concrete answers and thus be able to inform patients of what to expect when they’ve experienced something similar."

"We expect to add substantial information to the general knowledge base on the effect of blast injuries on Measuring the Effects on Oklahoma City's People

Within two weeks of the bombing, faculty in the Department of Psychiatry and the OU College of Public Health's Department of Biostatistics & Epidemiology were collaborating with the Oklahoma State Department of Health and The Gallup Organization to conduct a survey measuring the effects of the bombing on the larger Oklahoma City community.

Gallup employees conducted interviews with 1,010 randomly selected Oklahoma City employees, who then were compared with 750 interviewees from the selected study control city of Indianapolis, Indiana. Their specific task was to assess the magnitude of fatal and nonfatal injuries, the extent of disabilities and bombing-associated costs and determine if there were any identifiable environmental risk factors that affected injury severity or outcome.

Much of this information, particularly that related to emotional effects of the bombing, is still being analyzed, but some of the more immediate results of the poll include:

(1.) 19 percent of Oklahoma respondents reported attending one or more funerals for victims of the bombing; 39.2 percent participated in memorial services of other kinds. This compares with 17.4 percent of Indianapolis residents who participated in a memorial service.

(2.) 21 percent reported being between one and five miles away from the bombing site.

(3.) 100 percent of Oklahomans remembered where they were when the bomb exploded or when they first heard of it, compared with 85 percent in Indianapolis.

(4.) Large proportions of both metropolitan areas reported watching "a lot" of television in the aftermath of the bombing, 77 percent in Oklahoma and 49 percent in Indiana.

"We have gone to considerable effort to make the injury epidemiology available to the mental health database at the OU College of Medicine. We are working with Dr. Ronald Krug (interim chairman of the OU Department of Psychiatry & Behavioral Sciences) to monitor ongoing research on populations and try to affect the frequency with which the victims are contacted by professionals doing research projects," notes Dr. Robert Vincent, deputy commissioner for the Health Department. Vincent holds three degrees from OU and is an adjunct professor in the College of Public Health.

"Working on these bombing-related projects is an extension of a relationship we enjoy with the College of Medicine and the College of Public Health," Vincent says, "and was a chance to expand our contacts with the Department of Psychiatry. The Health Department and the OUHSC faculty
work together all the time. The general public isn’t always aware of how powerful a resource it is to have these agencies physically adjacent to each other and hooked up electronically."

**A Future of Bomb-Proof Buildings?**

Just as individuals now know that the back of an airplane is generally safest in a crash, we also soon may know the best spot inside a building in future bombing attacks.

A collaborative project between the State Health Department, the OU College of Architecture, the OU College of Public Health and the international engineering firm Failure Analysis is using detailed information from the Murrah building bombing to develop a model that can predict the physical damage to buildings from such attacks and where injuries and particular types of injuries are likely to be found.

"Beyond the clinical understanding of what occurred where with the Oklahoma City bombing, we expect to develop potent technology that would predict injury inside buildings that are affected by explosions," Vincent adds. "Initially, we expected to find research collaborators in places like Israel and Great Britain and to start out using their data as a baseline, but it really wasn’t there, so we are starting from scratch."

Vincent predicts more OU involvement as this particular project continues. He believes that an institute might naturally develop within the University where data could be collected and used to create practical applications, perhaps through a collaborative effort with FEMA and other professional and government agencies.

In addition to the future implications, this particular project has been very important to the Murrah building victims as well. "This study can help us to define our future after such a tragedy," Vincent says. "When we explain the project to the victims, their eyes light up. Most are very interested, and they see it as a way to help regain control over their lives and to participate in something positive out of their experience. It seems to really make a difference as people struggle to cope."

**“Listen to the Children”**

Statistics from the bombing indicate that 30 children were orphaned, while 219 lost at least one parent. Further, 40 percent of Oklahoma City school children interviewed had a family member or acquaintance killed or injured in the bombing—and that estimate is considered low.

With that kind of saturation impact in mind, “Listen to the Children,” a study of how well Oklahoma City’s children were and are coping with the bombing was begun as a collaborative effort between the OUHSC’s Department of Psychiatry & Behavioral Sciences-Child Psychiatry Division, its Emotional Health Center and the Oklahoma City Independent School District.

“We basically are trying to find out how the kids felt and how they coped with an act of urban terrorism of this magnitude,” notes Jerry Walker, who is coordinating the study along with Emotional Health Center co-directors Eric Dlugokinski and Sandra Allen.

“The kids out there seem to be doing okay, but what we as mental health professionals call ‘normal’ after a disaster like this has been defined in medical literature by natural disasters such as hurricanes and earthquakes, rather than man-made events.”

Interviews were conducted with nearly 6,000 children in 300 classes in the Oklahoma City public school system, ranging from first grade through high school. The project is funded partially by the Masonic Charities of Oklahoma.
homa and the United States Committee for UNICEF. The latter group is taping some of the interviews for a special televised presentation on the resiliency of children and of the Oklahoma City community.

The interviews were conducted in the form of class discussions focusing on questions suitable for all age groups. “Where were you when the bombing occurred?” “Why do you think this happened?” “What did you do to help yourself feel better?” The answers are being used to meet three goals:

1. To collect data for use in the future treatment of children subjected to acts of terrorism or man-made disaster.

2. To use the information as a screening device to identify children who are having ongoing emotional problems stemming from the bombing. “This was one reason we used three-person teams for the interviews,” Walker notes. “We had three sets of eyes watching the kids and were better able to pick up the full spectrum of their reactions.”

3. To help children who are doing well in the wake of the bombing. “For them this simply reaffirms what they are feeling and lets them know their feelings are normal, which is very reassuring to them,” Walker says. “Going through these interviews has helped many of these kids process what happened and move on.”

**Order in the Court**

Pfefferbaum, who in addition to

40 percent of Oklahoma City school children interviewed had a family member or acquaintance killed or injured in the bombing—

Drs. Eric Dlugokinski and Sandra Allen, co-directors of the OU’s Emotional Health Center, and their post-doctoral fellows went into Oklahoma City schools with unique counseling sessions for youngsters struggling with the trauma of the bombing. Dr. Laura Cohen is shown at left with students at St. James Elementary School.

Assessing the Injured

The Department of Psychiatry, under the direction of Interim Chairman Ronald Krug and Associate Professor Sara Nixon, is collaborating with Dr. Elizabeth Smith, a nationally known disaster expert at Washington University in St. Louis, to assess those injured in the bombing. Smith—who studied the Luby’s Cafeteria massacre in Killeen, Texas, among others—maintains a national database in disaster research that is being used for comparisons with the new bombing-related data.

“Research from other disasters is being used as the basis for our response to this one,” Krug notes. “Dr. Smith and our faculty are using a planning database from the Buffalo Creek disaster in West Virginia in
the early 1970s, when an earthen dam collapsed, probably due to human error. In that disaster, 160 people were killed and 1,000 were made homeless. The people involved in this tragedy have been followed for the last 20 years, and we are using it as a model because a great deal of mental duress litigation resulted.

“What’s most alarming is that these data showed that years after the event many were still impaired mentally. Specifically, 44 percent were still experiencing problems two years after the event; and 28 percent were still symptomatic 14 years after the event. This tells us that we in Oklahoma are not in short-term crisis mode here; we are looking at years of recovery.”

Besides the flood of research, many OUHSC faculty continue to treat patients involved in the bombing, most notably faculty in the Child Study Center and the departments of orthopaedic surgery & rehabilitation, otorhinolaryngology, pediatrics, psychiatry & behavioral sciences, and oral & maxillofacial surgery. Dr. Steven Sullivan, chairman of the latter, is among the College of Dentistry team who has repaired the badly lacerated and broken jaw of toddler Joseph Weber. Joseph was seated at the same table in the day care center as Baylee Almon, the bombing victim whose Pulitzer Prize-winning photograph in the arms of an Oklahoma City firefighter was published worldwide. To make certain his jaw develops normally, Joseph will be followed by the department until he reaches late adolescence.

Also under way is “Strengthening the Heartland,” a joint project of the Child Study Center at Children’s Hospital and the HSC departments of pediatrics and psychiatry. Using grant funds provided by Children’s Medical Research Inc., the agencies are offering free assessment and treatment of children, their families and other adults affected by the bombing. The project is designed to complement care already being offered through Project Heartland and includes needs/risk assessment and intervention services for both individuals and groups.

“Crisis counseling and supportive programs are important to positive healing and recovery, but these services alone may not be sufficient to regain our strengths,” notes Dr. Robin Gurwitch, clinical assistant professor of pediatrics and director of the Child Study Center’s trauma intervention programs. “People have very individual timetables on how they respond to a tragedy such as this, and our services help parents answer such questions as ‘Is my child doing okay?’ Once an assessment is completed, specific interventions and treatments to address the aftermath of trauma may or may not be needed. Strengthening the Heartland programs are designed to address specific issues that individuals and families may still have as they continue to recover from this tragedy.”

With the wealth of research, treatment and other bombing-related efforts continuing, “Strengthening the Heartland” might be an appropriate addition to the OU Health Sciences Center’s current motto of “Teaching, Healing, Discovering.” As College of Allied Health Dean Carole Sullivan says: “Just being here on campus is a series of highs and lows, successes and failures for all of us. It’s a very human experience, and coming into that was this incredible experience and devastation. It certainly reaffirmed for all of us the value of a single life, and I don’t think as a society we’re given the opportunity to appreciate that very often.”
An OU Psychiatrist Views the Long Term

As people continue their emotional and physical recovery from the federal building bombing, Dr. Ronald Krug, interim chairman of the OU Health Sciences Center's Department of Psychiatry, offers his professional opinions on how to continue the healing process. Krug warns of the consequences of not addressing the ongoing emotional toll of Oklahoma's collective tragedy.

"The most important thing at this stage of the game is that we are instrumental in preventing the revictimization of all those who were involved—the injured, the rescuers and the volunteers," Krug states. "It's also important to remember that this disaster was and is being felt in phases. The immediate symptoms of stress, for many, have disappeared.

"However, there is a subset of people—potentially as high as 20 percent—whose symptoms won't show up until much later, and their problems as a group are more chronic and more serious. What is critical is that we remember that different people react to tragic events in different ways, and we in no way want to give the message to people that 'everyone else is feeling this way—why aren't you?' Fortunately, the multiple research projects we have in place are helping us to understand this better and to establish a firm basis to help these people down the road."

At a time when "managed care" has penetrated Oklahoma's health care system, funds for mental health programs and treatment are fast disappearing. This is particularly tragic, Krug notes, because of the special new long-term needs of the Oklahoma City and the larger Oklahoma communities.

"What we need to get across is that mental health care is expensive, but if history has shown us nothing else, it's that if we don't take care of the emotional crisis now, these people will find a more expensive way to express their feelings—through illness, depression, the inability to work, etc. We are seeing and will continue to see higher rates of substance abuse, domestic and child abuse, which in turn leads to legal costs."

He adds, "There also are a whole host of disorders we know of that have their origins in childhood trauma—such as borderline personality disorder, chronic depression, substance abuse and other antisocial behaviors. We have 249 children who lost one or both parents in the bombing and many others who were injured, so there is a real prevention issue that needs to be addressed."

Krug also stresses the importance of obtaining professional psychotherapy to address serious emotional problems, rather than relying solely on support groups, crisis hot lines, advocacy groups or other forms of counseling. "Support groups and other such programs have their place, but they do not take the place of good quality, highly skilled psychotherapy, particularly for children who are experiencing problems," he emphasizes. "In fact, many groups who are offering 'counseling' right now end up making things worse for someone who has been severely traumatized."

Krug sees a particular problem in groups that encourage bombing survivors to assume a "victim" mentality. Some even label their members as "victim survivors."

"People can build their entire life around an event like the bombing, and it's very unhealthy," Krug says. "It was a tragic, awful atrocity, and we are forever changed by it. But life goes on, and we need to put it into its appropriate place, not see ourselves as helpless or 'owed.' If we allow this event to destroy our lives, then the bombers win."—Staci Elder Hensley