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DNA Solves Property Crimes (But Are We Ready for That?)

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DIRECTOR'S MESSAGE

This month's cover story features the findings from NIJ's DNA Field Experiment, which investigated the cost-effectiveness of using DNA evidence to solve property crimes. I am looking forward to discussing the experiment at the opening session of the International Association of Chiefs of Police annual meeting in November.

A critical aspect of the President's DNA Initiative is the post-conviction program. NIJ was extremely pleased recently to award nearly $8 million to five states — Arizona, Kentucky, Texas, Virginia and Washington — to help defray the costs of post-conviction DNA testing. States can use the money to review murder and rape cases, locate evidence, or analyze DNA in cases in which the innocence of a convicted person may be demonstrated through DNA.

The awards are an important first step, but frankly, we expected many more states to apply. We are taking steps to encourage stronger interest by: (1) asking states why they did not apply, (2) hosting workshops to help states build the infrastructure for a post-conviction program, (3) evaluating the efforts of states that received money and identifying lessons learned, and (4) funding an examination of exonerations nationally.

In October, NIJ will once again partner with the Departments of Homeland Security and Defense for the 10th Annual Technologies for Critical Incident Preparedness conference, which brings together first responders, business leaders and academic thinkers to share solutions for preparing for and responding to critical incidents. NIJ will feature its recent work in such diverse technologies as through-the-wall imaging and biometrics devices, the identification of human remains, and our ready-to-deploy mobile forensics laboratories.

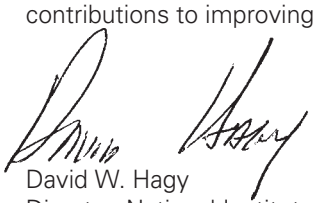
Terrorist incidents are a common topic at the Critical Incident conference, and NIJ has recently awarded two grants to study law enforcement's role in preventing such events. Researchers at RAND are looking at how agencies shifted resources or increased spending after Sept. 11, what effect the spending changes had, and how the agencies are balancing the new demands of homeland security. Michigan State University is conducting a review of national information-sharing efforts — including an assessment of fusion centers — to identify major obstacles to effective intelligence gathering and information sharing and to develop best practices.

NIJ also recently awarded a major grant for an in-depth study of large and small law enforcement agencies. The study has three components:

- Personnel: the life cycle of patrol officers and supervisors from the time they are hired until they retire.
- Agencies: differences in leadership styles and accountability systems and their effect on the structure, practices and culture of a department.
- Innovations: how agencies introduce and test innovative training and operational issues — for example, how can we improve interactions between officers and the public in traffic stops, burglaries and domestic violence situations?

The study will work with the Executive Session on Policing and Public Safety at Harvard University's Kennedy School of Government over the next several years in what I know will provide useful knowledge and insight to the law enforcement community.

As our country begins its transition to a new administration, I look forward to following NIJ's contributions to improving the justice system and making our communities safer.



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Knowledge to
Meet the Challenge of
Crime and Justice

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Results of an experiment using DNA to solve property crimes are in: collecting biological evidence at burglary scenes works.

The study — funded by the National Institute of Justice (NIJ) and evaluated by the Urban Institute — compared burglary investigations that used only traditional police practices to burglary investigations in which DNA evidence was *also* collected and analyzed. The study revealed that, when DNA was added to traditional property crime investigations:

- More than twice as many suspects were identified.
- Twice as many suspects were arrested.
- More than twice as many cases were accepted for prosecution.

The DNA Field Experiment also found that suspects were five times as likely to be identified through DNA evidence than through fingerprints; blood evidence was more effective in solving property crimes than other biological evidence, particularly evidence from items that were handled or touched by the suspect; and evidence collected by forensic technicians was no more likely to result in a suspect being identified than evidence collected by patrol officers.

Another significant finding of the unprecedented experiment — conducted in Orange County, Calif.; Los Angeles; Denver; Phoenix; and Topeka, Kan. — was that suspects identified by DNA had at least twice as many prior felony arrests and convictions as those identified through traditional burglary investigation.

The results of the DNA Field Experiment have the potential to turn a significant component of our criminal justice system on its head. The implications are that dramatic.

Consider that there were 2,183,746 burglaries reported to the police in 2006.[1] Only 12 percent of the cases were solved.[2]

We also know that many, many burglaries are not reported to the police; according to the National Crime Victimization Survey, only half of the burglaries committed in the U.S. in 2006 were reported to police.[3]

The results of NIJ's Field Experiment would seem, therefore, to be very good news. But there is something lurking behind the good news.

Policy decisions. Big policy decisions.

As we increasingly come to understand the potential of DNA to solve property crimes, the demands to use this highly effective tool could overwhelm our criminal justice system. Although the DNA Field Experiment showed that benefits are clear and dramatic, some of the big-picture policy questions are confounding:

- How will our nation's crime laboratories process the increase in evidence?
- Are we willing to hire more prosecutors and public defenders to handle an increased volume of cases?
- How can we ensure that using DNA to solve burglaries will not pull investigative resources away from *other* criminal investigations, such as sex crimes in which consent is the issue, robbery and domestic violence?
- If we solve the police and crime lab issues, do we need to revisit sentencing guidelines — or are we ready to build more jails and prisons to handle an influx of property crime offenders?

"There is a criminal justice revolution coming," said John Roman, a senior research associate in the Urban Institute's Justice Policy Center and the primary author of the evaluation. "We need to have these discussions now, so we don't have to have them on the run."

What Inspired the Study?

Throughout the 1980s and 1990s, DNA gained acceptance in our scientific and legal communities. Today, most Americans know that DNA is used to identify, confirm or exonerate suspects in violent crimes, such as homicide and sexual assault. In the past five years, however, there has been growing interest in expanding the capacity of police agencies and crime laboratories to collect and analyze DNA evidence in high-volume crimes, such as commercial and residential burglary and theft from automobiles. Interest in using DNA to solve property crimes is driven by high recidivism rates among burglars and dramatic improvements in the technology itself.

The results of the DNA Field Experiment have the potential to turn a significant component of our criminal justice system on its head.

NIJ launched the DNA Field Experiment to test successes that were being experienced in places like Dade County, Fla., New York City and the United Kingdom in solving property crimes using DNA evidence. NIJ also wanted to determine how cost-effective it is to use DNA in property crime investigations and whether processing DNA evidence in property crimes actually leads to more arrests and prosecutions.

How Was the Money Spent?

Because the five study sites had different goals, it is important to keep in mind — especially when looking at the results from the individual sites — that NIJ's overall mission was to examine a variety of ways in which DNA evidence can be used to solve property crimes.

Although some "best practices" may be gleaned from the study — particularly when outcomes are gauged against costs — the project was not designed to determine best practices; rather, it was designed to investigate different *approaches* in using DNA as an investigative tool to solve property crimes.

In Denver — a city of 550,000 where 7,500 property crimes are committed annually — officials sought to increase the collection

of blood or other bodily fluids with the expectation that more suspects would be identified, arrested and prosecuted.

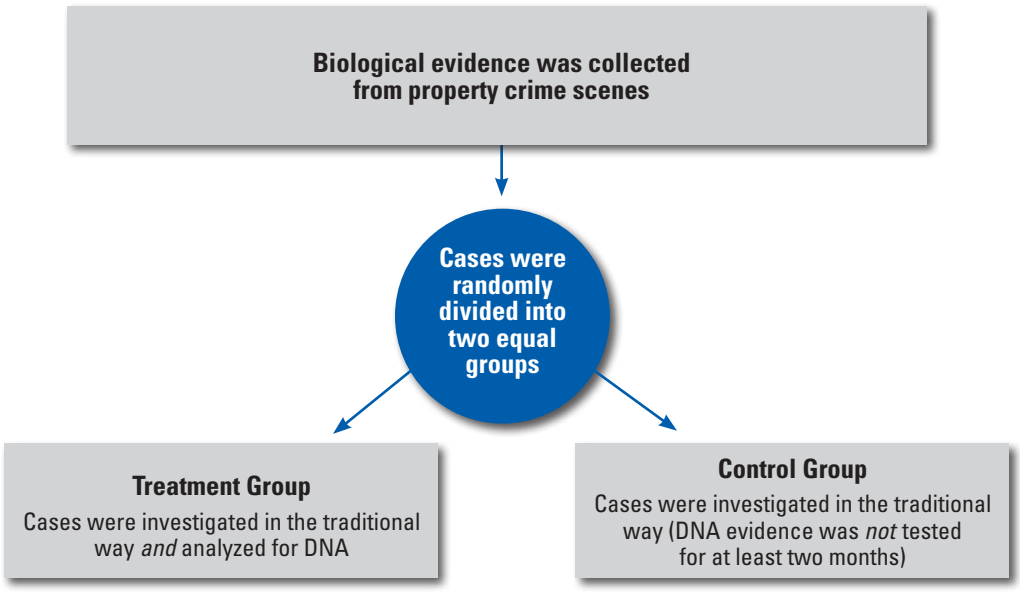
In Orange County, on the other hand, law enforcement had been using DNA evidence to solve residential and commercial burglaries for some time; therefore, officials in the South Patrol Operations Division (serving 500,000 residents who experience approximately 950 residential burglaries annually) decided to use NIJ funds to test the probative nature of so-called "touch" samples — exploring the types of DNA profiles that could be obtained from a variety of nontraditional sources of potential biological evidence, such as computer cords, jewelry boxes and door handles.

In Los Angeles, funding was used in a different — but equally interesting — way. Although authorities in the Valley Bureau (which serves more than 1.2 million people and experiences approximately 34 percent of the city's residential burglaries) saw the project as an opportunity to test DNA in high-volume property crimes, a large backlog of homicide and sexual assault evidence meant that the only viable option was to use the NIJ grant to pay for outsourcing the DNA analysis.

Before the DNA Field Experiment, the Phoenix Police Department had experienced some success using DNA evidence to solve property crimes; therefore, authorities in the two precincts in which the experiment was performed (Desert Horizon, with 400,000 residents, and Maryvale, with 265,000 residents) decided to use the funds to expand their ability to collect and process DNA in these cases.

And finally, in Topeka — where approximately 2,700 property crimes are committed annually — the goal was two-fold: to determine whether patrol officers could effectively collect high-quality biological evidence from crime scenes and to investigate the hypothesis that touch samples were less likely to yield Combined DNA Index System (CODIS)-uploadable profiles and, therefore, should be a lower collection priority.[4]

How Did the DNA Field Experiment Work?



How Did the DNA Field Experiment Work?

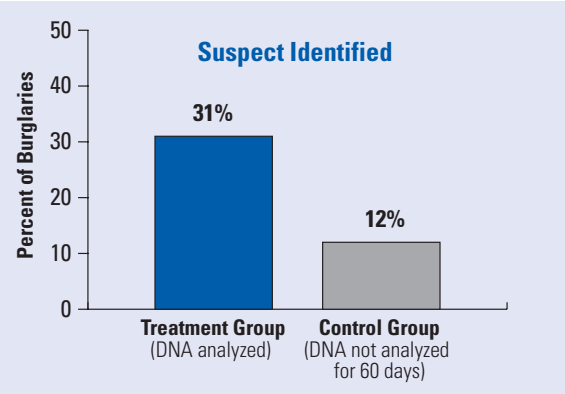
From November 2005 to July 2007, each of the five jurisdictions collected biological samples — evidence thought to contain human cells in the form of hair, tissue, bones, teeth, blood or other bodily fluids — from 500 property crime scenes.[5] Researchers at the Urban Institute then randomly divided the cases into two equal groups: the "treatment" cases and the "control" cases.

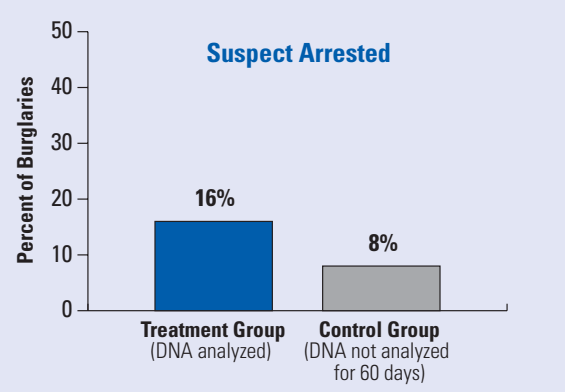
In the treatment group, cases were investigated in the traditional way *and* the evidence was analyzed for DNA. If DNA was found, it was run through CODIS, and, if it resulted in a "hit," follow-up was conducted. In the control group, cases were investigated in the traditional way and evidence was not analyzed for DNA for at least two months. The police were *not* told if a case was in the treatment or the control group; therefore, officers pursued traditional burglary investigations in both groups. The only difference in how the cases were handled (during the first two months post-burglary) was whether DNA analysis was performed on the evidence.

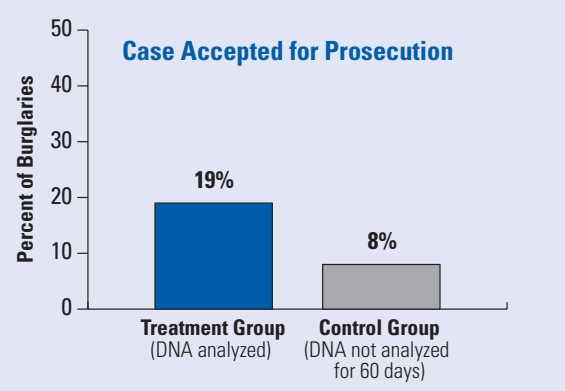
Here is an overview of cases from all the sites: 57 percent of the crime scenes were residential burglaries, 29 percent were commercial burglaries and 13 percent were thefts from automobiles. Nearly 70 percent of the points of entry were through doors or windows; in 17 percent of the cases, the property was unlocked. The most common items stolen were electronics (38 percent), jewelry (13 percent) and cash or a cash substitute (11 percent); in 9 percent of the cases, nothing was stolen.

As can be seen in the graphs to the right, across all the sites, a suspect was identified in 31 percent of the treatment group cases (in which DNA evidence was collected and analyzed).[6] In the control group (in which DNA evidence was collected but *not* tested for at least two months), a suspect was identified in only 12 percent of the cases.[7] In the DNA-tested group, police arrested a suspect in 16 percent of the cases. In the non-DNA-tested group, they arrested a suspect in only 8 percent of the cases.

Suspects Identified, Arrested and Prosecuted in All Sites







Cost-Effectiveness of DNA Case Processing

	Denver*	Topeka	Phoenix	Los Angeles	Orange County	All Sites†
Per suspect identified	$1,466	$1,244	$6,170	$8,147	$4,822	$4,502
Per arrest	$3,679	$5,223	$27,378	$10,319	$19,287	$14,169
Per case accepted for prosecution	$1,903	$4,178	$10,785	$12,899	n/a	$6,169

* Denver's costs are highlighted because officials there used assumed "best practices" in the field experiment; other jurisdictions (with mature crime labs and similar leadership commitments) could likely experience similar results.

† Weighted average.

How Much More Does DNA Evidence Cost?

In its evaluation of the DNA Field Experiment, the Urban Institute used what is called "cost-effectiveness analysis" to calculate the cost of labor and supplies in the treatment (DNA-tested) cases. First, the researchers calculated the cost of six separate stages of DNA analysis: preliminary testing, generation of a profile, CODIS entry, case verification,[8] investigation and post-arrest. Then they determined the costs (for labs and police departments) based on three outcomes:

- Was a suspect identified?
- Was an arrest made?
- Was the case accepted for prosecution?

The costs are reported as the *additional* cost of processing a case with DNA evidence, over and above the cost of using traditional burglary investigative procedures. "Processing a case" covered from the time the evidence was delivered to the local lab until the case concluded, including suspect identification, apprehension and arrest if the case progressed that far.

The full report contains in-depth analyses of the costs from each of the test sites, but here is the bottom line.[9] On average — across the five test sites — using DNA to solve a property crime cost an additional:

- $1,400 to collect and process DNA evidence.
- $4,502 to identify a suspect (who would not otherwise have been identified).
- $14,169 to arrest a suspect (who would not otherwise have been arrested).

It is important to recognize these numbers for what they are: true averages. The costs were very different across the five sites for a number of reasons, including whether the lab work was done in-house or outsourced; the wages of forensic scientists, police officers and detectives; nonlabor costs; and the number of samples analyzed. The cost also depended on the quality of the DNA evidence collected and whether or not a profile — and then a CODIS match — was obtained.

The table on this page highlights Denver for a reason. Officials in Denver chose to use NIJ's Field Experiment to maximize results (that is, to increase the number of suspects identified and arrested). To do this, they used assumed best practices in evidence collection, fine-tuned coordination among the agencies, and aggressively arrested and prosecuted suspects. It is reasonable to expect that other jurisdictions with mature crime labs — and similar protocols and leadership commitment — would experience results most like those in Denver.

"One of the main reasons for Denver's success was the involvement of top leadership throughout the project," Roman said.

Again, it should be kept in mind that these are the *additional* costs — on top of the

TRAINING FOR DNA EVIDENCE COLLECTION FROM BURGLARIES

The DNA Field Experiment found that officers who were adequately trained did as well as more specialized forensic personnel in identifying and collecting probative evidence. But how much does it cost to teach officers to collect biological evidence?

Although the Urban Institute's evaluation did not systematically examine the additional DNA training that jurisdictions provided to evidence collectors, the training appeared to be more or less the same in all five test sites: a day or two of officer (or other evidence collector) time, plus the cost of the trainers.

"Training appeared to be most effective when it was ongoing," said John Roman, senior research associate at the Urban Institute's Justice Policy Center. "Therefore, jurisdictions that want to begin using DNA evidence to solve property crimes would have to include such costs in any cost-benefit analysis."

Phoenix, one of the five test sites in the NIJ study, offers an example: 80 officers and detectives from the participating burglary divisions attended a one-day classroom course taught by forensic scientists from the department's crime lab. Training consisted of several hours on how to identify, collect and preserve DNA evidence and several hours on testifying in court. At the end of the training, officers were given kits containing the tools for DNA evidence collection. They were also given laminated cards on collection procedures, including information that could be given to property crime victims on preserving evidence before it is collected by authorities. Urban estimated that the cost of the training (labor and materials) in Phoenix was $26,000 or about $100 for each of the 250 cases in the DNA-tested group.

To help its state and local partners reduce training costs, NIJ created a training tool — available online — to help investigators and crime scene specialists learn how to identify, secure, document and preserve blood, hair, urine, saliva, skin cells and other biological evidence at property crime scenes. A section on evidence collection covers procedures, equipment, control and reference evidence samples, evidence marking and packaging, and chain of custody. The course also offers a bird's-eye view of the Combined DNA Index System and how it helps solve crimes. **To access the training, go to http://www.dna.gov/training/property-crime.**

cost of traditional burglary investigations — of using DNA to identify, arrest and prosecute burglars who otherwise would not have been caught. Also, it is important to note costs that were *not* included in the study. Training personnel to identify and collect biological material and transporting evidence to the crime lab were not included because cases were randomly assigned to either the treatment or the control group *after* those activities occurred. Needless to say, these costs would be important to policymakers who are considering funding the use of DNA evidence to solve property crimes in their jurisdictions. (See sidebar, "Training for DNA Evidence Collection From Burglaries," on this page.)

It is also important to note that the study did not allow researchers to identify the *percentage* of property crime scenes that actually contained DNA evidence. We therefore do not know how effective various types of evidence collectors and search protocols are in *locating* DNA evidence at a property crime scene. This is important in a cost-benefit analysis because, if the number of scenes with biological evidence is small, DNA profiles would be rare, making the average cost to obtain a profile high.

And, perhaps most noteworthy for policymakers who consider a cost-benefit analysis: If more property crime offenders

THE NEXT STEP: COMPLETING THE COST-BENEFIT ANALYSIS

The National Institute of Justice is taking the next step to determine whether collecting forensic evidence at property crime scenes is worthwhile given the costs involved.

Because data collection in the first DNA Field Experiment ended in July 2007, the outcomes of many cases — including the number of suspects identified, arrested and prosecuted — could not be included in the cost-benefit analysis performed by the Urban Institute. Although the cost figures reported in the main story — both averages and broken down by the five field sites — offer an important starting point for policymakers who want to consider whether DNA is cost-effective in solving high-volume property crimes, they do not include crucial information about the consequences of arrest, trial and incarceration.

Therefore, the Urban Institute is now looking at the final disposition of cases in the original DNA Field Experiment: the 1,079 cases in the "treatment group" (that tested DNA evidence) and the 1,081 cases in the "control group" (that did not test DNA evidence for at least 60 days).

To do this, researchers will estimate the cost of adjudicating the cases and, by looking at the sentences handed down, will also calculate costs of incarceration or supervision. In addition, they will use various models to predict the number — and type — of crimes "averted" by the burglars' incarceration. These "averted crimes" will then be monetized and compared to the costs of using DNA to identify, arrest, charge, convict and incarcerate the property crime offenders; this, effectively, could be considered the benefit (or "savings") to society of crimes that would have been committed had the offender not been sent to prison.

Results of the study are expected next summer.

are arrested and incarcerated, states will have to pay substantial additional costs to incarcerate or monitor them on probation. On the other hand, of course, if such offenders are incarcerated, there may be substantial benefits to the community if there is less crime. (See sidebar, "The Next Step: Completing the Cost-Benefit Analysis," on this page.)

Does DNA Catch More *Dangerous* Criminals?

One finding of the NIJ study could be considered particularly stunning, depending on how one regards the context: Suspects who were identified using DNA evidence had significantly more serious criminal histories than those identified through traditional property crime investigations. Suspects identified through DNA had an average of 5.6 prior felony arrests (compared to 1.7 prior felony arrests for suspects identified through traditional investigation) and 2.9 prior felony convictions (compared to 0.9 felony convictions for those identified through traditional investigation).

Does this mean that using DNA to investigate property crimes actually catches more dangerous criminals?

Although DNA does nab burglars with more serious rap sheets, this may be because most law enforcement agencies currently enter only convicted felons into CODIS. If states move to include additional offenses in CODIS — for example, felony arrestees or even all arrestees — this phenomenon (of DNA identifying property crime suspects with more felony arrests and convictions) may decrease.

Another important thing to keep in mind when interpreting these results: Given the short period during which this study was

conducted (less than two years), many arrest records were not yet available when data collection ended; at that time, criminal histories were available for only 43 percent of the suspects who were identified and only 64 percent of suspects who were arrested.

Lessons Learned in Evidence Collection

By the end of the DNA Field Experiment, the Urban Institute had a rich database from which to draw conclusions: 1,800 samples from 1,074 property crime scenes. Here are some of the findings that have significant implications for police departments considering the use of DNA evidence to solve property crimes:

- There was no evidence that DNA collected by crime scene technicians was more likely to yield a DNA profile (or subsequent CODIS match) than evidence collected by police officers or detectives.
- Blood and saliva samples were much more likely to yield usable DNA profiles than samples of cells taken from touched or handled items.
- Collecting a whole item (rather than swabbing the item for DNA) increased the likelihood of obtaining a DNA profile; swabbed items were 30 percent less likely to yield a profile.
- Crime scenes in which the property was unlocked (and therefore did not require the suspect to break a window or pry open a door) were less likely to yield a probative sample.

Three Key Words: Communication, Communication, Communication

Using DNA as a tool to solve property crimes is not as simple as adding two or three protocols to a police department's standard operating procedures. Implementing a soup-to-nuts system like that designed for NIJ's Field Experiment requires constant communication. To be successful, the use of DNA evidence to solve property crimes requires a level of collaboration among police, crime laboratories and prosecutors that is not routine in many jurisdictions.

Using DNA evidence to solve property crimes requires a level of collaboration among police, crime laboratories and prosecutors that is not routine in many jurisdictions.

Put simply, communication is key.

Police officers must be trained to identify and collect biological evidence. (See page 13, "DNA Training Resources.") Senior management must communicate its commitment so officers and detectives clearly understand that collecting DNA evidence at property crime scenes is a priority.

The crime lab must communicate with the police department. The DNA Field Experiment demonstrated how important it is for the lab to give feedback to officers on the effectiveness of their evidence collection, letting them know about attributes of evidence with a higher probability of suspect identification — offering additional training, if necessary, in a way that does not stigmatize the officers about their prior work — and making sure they are told when evidence that they have collected yields a CODIS hit.

And, needless to say, the crime lab must be capable of processing evidence quickly enough so law enforcement's investigation of the case is not compromised.

Prosecutors must notify the police and crime labs about case outcomes. Prosecutors also need to work with police and lab personnel so that they are comfortable testifying at trial, if necessary.

As Roman put it: "Evidence from this study suggests that profound changes in the way police, prosecutors and crime laboratories interact are required to efficiently use DNA in property crime investigations."

Could crimes that can have a demonstrably higher closure rate, such as property crimes, take attention and resources away from crimes that are not aided by DNA, such as sex crimes in which consent is the issue, domestic violence, robbery and drug offenses?

Where to From Here: Policy Considerations

Underlying what police departments, crime labs and district attorneys think about using the powerful tool of DNA to solve property crimes is, of course, how American citizens would regard the societal ramifications. NIJ's Field Experiment showed clear and compelling results: there is no doubt that many, many burglars who are not currently identified by traditional investigations could be identified using DNA. However, expanding the use of DNA to solve property crimes has major policy implications.

Consider this: In 2006, more than 109,000 murders and rapes (the two crimes that now consistently use DNA evidence) were reported to police in the U.S.[10] That same year, there were more than 2 million burglaries, many of which were likely committed by repeat offenders. Other crimes for which DNA might be an investigative tool (theft from auto and motor vehicle theft) account for millions of additional crimes. Without a financial commitment to support all the key players — police, labs, the courts, corrections and possible legislative changes — making DNA the norm in property crime investigations could overwhelm our criminal justice system.

Collecting DNA in property crimes will increase the number of suspects that detectives need to track down and arrest; a few of the jurisdictions in the DNA Field Experiment had problems because of detective caseload and the need to obtain confirmation samples. Collecting DNA in property crimes also will increase the number of prosecutions, which means that district attorneys and public defenders must be able to handle more cases. It is clear from the DNA Field Experiment that police and prosecutorial leadership must be committed to following up on CODIS hits.

As noted earlier, one of the findings of the NIJ study is that forensic technicians were no more effective than patrol officers in collecting biological evidence that yielded CODIS-uploadable evidence. Needless to say, using patrol officers as investigators searching for biological evidence — in addition to their mandate to ensure public safety — has major implications. If using DNA evidence to solve property crimes becomes the norm, law enforcement officials will have to answer some important questions:

- How much training in DNA evidence identification and collection should patrol officers receive?
- Should that training occur in police academies, and how much of an additional investment would this require?
- Or, should communities focus on training additional forensic technicians to aid collection — or even train civilian volunteers?
- What are the implications of additional time-on-scene that would be required for police officers?
- How would prioritization of calls for service be affected?

The Most Significant Hurdle?

Perhaps the most significant hurdle in using DNA to solve property crimes is how to reduce the backlog of evidence that currently needs to be analyzed in our nation's crime labs. Expanding the analysis of biological evidence to include high-volume property crimes would, of course, create an even greater backlog. In the NIJ study, existing backlogs were a barrier to expanding the use of DNA, and the two sites that experienced the highest costs — Los Angeles and

Phoenix — were those that outsourced their lab work.

Questions would have to be answered to determine how quickly crime laboratories could be equipped to meet an increased demand for DNA processing. For example:

- What additional investment would be needed to expand laboratory capacity?
- What types of capital investments in new technology would be required?
- Should jurisdictions increase their in-house laboratory capacity or outsource to private labs?[11]

Laws and sentencing guidelines might also have to be reconsidered. In jurisdictions in which a CODIS match is not sufficient grounds for an arrest warrant, for example, police have to obtain a search warrant to get a confirmation sample if the suspect is unwilling to provide it voluntarily. Sentencing guidelines for property crimes vary from jurisdiction to jurisdiction, which, of course, affects any cost-benefit analysis that incorporates prison and probation costs.

Put simply, using DNA works, but it costs. If the experience in the United Kingdom is a guide, the demand for additional DNA collection and testing will likely increase over time. But because DNA-led investigations are more costly than business-as-usual, the public — and the policymakers who allocate public resources — will have to perform a societal cost-benefit analysis, especially considering the millions of property crimes committed in this country every year. If police catch more offenders, states may have to pay substantial additional costs to incarcerate or monitor them; that may — or may not — yield substantial benefits to the community in reduced crime.

The cost benefits of collecting, processing and using DNA evidence to solve property crimes seem clear ... nearly as clear as the potential ramifications. Concerns have been expressed, for example, about the possible effect investigating high-volume property crimes could have on the investigation and prosecution of *other* crimes. Could crimes that can have a demonstrably higher closure rate, such as property crimes, take attention and resources away from crimes that are *not* aided by DNA, such as sex crimes in which consent is the issue, domestic violence, robbery and drug offenses?

As jurisdictions increasingly face budget shortfalls, what trade-offs are citizens — and policymakers, on their behalf — willing to make?

Let the debate begin.

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About the Author

Nancy Ritter is the editor of the *NIJ Journal*. She has 30 years of experience in the criminal and civil justice field, including as an award-winning legal journalist.

For More Information

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4. CODIS is an umbrella term referring to all federal, state and local DNA index systems that search DNA profiles from crime scenes against DNA profiles from known and unknown persons. Managed by the FBI, the National DNA Index System contains databases of: (1) profiles from crime scenes, (2) profiles from convicted offenders and, depending on the state, arrestees, (3) unidentified human remains, (4) missing persons and (5) relatives of missing persons.

5. The cases were the *first* 500 cases in the jurisdiction in which biological material was found at the crime scene after the project started; that is, they were not "selected." Topeka and Los Angeles did not hit the 500-case mark; Topeka finished with 260 cases and Los Angeles with 391 cases.

6. Technically, a CODIS match does not identify a suspect; that is, individuals who are identified through a match to a CODIS profile do not immediately become suspects — rather, they are individuals who must be further investigated to determine if they could be the offender. In the NIJ study, only matches in which investigators identified a person as a suspect were reported; for simplicity, therefore, the study refers to a CODIS match as identifying a suspect.

7. This percentage is very close to the FBI's estimate that 12.7 percent of burglary cases are cleared through traditional evidence.

8. Case verification occurs when a CODIS hit matches an offender in the state's DNA database; it does not apply to forensic matches.

9. With only five sites in the study — and with variations in how the experiment was conducted — caution should be used when trying to compare cross-site results. In Denver and Phoenix, for example, nearly all DNA profiles were uploaded into CODIS; in Orange County, however, where they collected a substantial amount of touch evidence at commercial burglaries, only 41 percent of cases were uploaded (which revealed the difficulty in obtaining probative samples from these sources). Orange County also had the lowest rate of CODIS hits; anecdotal evidence suggests that this may have been due to a higher percentage of juvenile offenders. Topeka had the highest CODIS hit rate but the lowest rate of suspect identification via a CODIS hit. The greatest variation across the sites was the proportion of identified suspects who were arrested. Denver — which encouraged aggressive follow-up investigation — arrested 86 percent of known suspects. On the other hand, Topeka arrested only 23.8 percent; this is likely due to Kansas' policy that a CODIS hit is not considered sufficient for an arrest warrant. Across all five sites, if an arrest was made, the case was accepted for prosecution 90 percent of the time.

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11. Only costs associated with processing an individual case were included in the study; the fixed costs of operating a police agency or a crime laboratory were not included. Although the NIJ study found that outsourcing is more expensive than in-house processing, the study did not consider major fixed costs of purchasing robotics and other technology. The study, therefore, reflects the costs to a police department with a mature crime lab; the cost to set up a crime lab or to begin collecting DNA for the first time would be substantially higher.

Prisoner Radicalization: Assessing the Threat in U.S. Correctional Institutions

by Mark S. Hamm, Ph.D.

Years from now when criminologists write their textbooks on American terrorism, the name Kevin Lamar James may appear alongside such infamous figures as Timothy McVeigh, Ramzi Yousef and Osama bin Laden.

Kevin James is scheduled to be sentenced in February 2009 for conspiring to wage war against the United States. James pleaded guilty to the charge after he and three other men were indicted in 2005 for plotting to attack U.S. military facilities, Israeli government facilities and Jewish synagogues in Los Angeles.[1]

At the time of the indictments, the FBI described the plot as the most operationally advanced since Sept. 11.[2] Even more troubling is that James designed the plot while serving time in a California state prison.

Prisoners — especially those in gangs — have long recruited other inmates to act as their collaborators upon release. James, however, was the first gang member to radicalize inmates into joining a prison gang with a terrorist agenda.

A recent study funded by the National Institute of Justice (NIJ) and conducted by this author took a closer look at the Kevin James case as part of a larger study on radicalization in prison. My study examined trends in prisoner radicalization — or the process by which prisoners adopt extreme views, including beliefs that violent measures must be taken for political or religious purposes — in U.S. correctional institutions.[3]

The two-year study included a comprehensive literature review and approximately 140 hours of interviews with 15 prison chaplains, nine gang intelligence officers and 30 inmates incarcerated for violent crimes in Florida and California. I examined the conversions of inmates to

non-Judeo-Christian religions — Islam, Buddhism, Native American faiths, Black Hebrew Israelism (a black supremacy group) and those preferred by white supremacists (i.e., Odinism/Asatru, Teutonic Wicca and Christian Identity) — and the role of prison gangs in inmates' spiritual lives.

My research found that:

- Although only a very small percentage of converts turn radical beliefs into terrorist action, the James case is not an isolated event. Gang intelligence officers in Florida and California reported having uncovered potential terrorist plots inside prisons.
- Prisoners who convert to a non-Judeo-Christian religion are primarily searching for meaning and identity. In most cases, the conversion experience makes a meaningful contribution to prisoner rehabilitation.
- Radicalization in prisons is linked to prison gangs.
- Inmate leadership is the most important factor in prisoner radicalization.

The Man Behind the Plot

Although looking at one man's story is admittedly anecdotal, understanding some of James' life may help inform our understanding of how U.S. prisoners are radicalized.

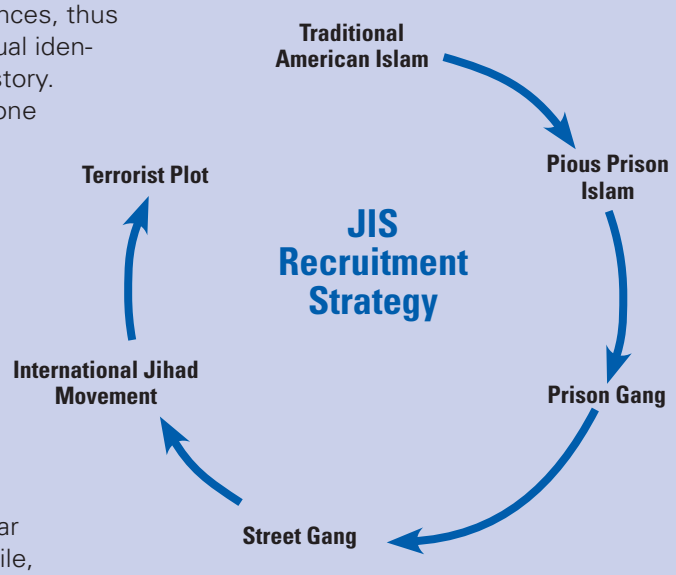
James grew up in South Central Los Angeles during the urban crack epidemic of the late 1980s.[4] During his teenage years, he was a member of the 76th Street Crips gang. In 1997, at the age of 21, James began serving a 10-year sentence at the California State Prison in Tehachapi for robbery.

While in prison, James followed a traditional form of American Islam (Nation of Islam). However, he soon found its teachings uninteresting and drifted toward a fringe group of Sunni Muslims within the correctional institution, who were known as Jam'iyyat Ul-Islam Is-Saheed (the Assembly of Authentic Islam) or JIS.

LINKING PRISONER RADICALIZATION AND TERRORISM: THE JIS CASE

The link between prisoner radicalization and terrorism can be seen in the JIS case, particularly in the way the group recruited and operated. JIS began with a traditional form of American Islam (Nation of Islam). This was used to create an alternative religious vision expressed in a pious but mutating form of Sunni-inspired "Prison Islam," which encompasses gang values and fierce intra-group loyalties based on "cut-and-paste" interpretations of the Koran.[5] This vision provided JIS members with identity, meaning and a form of collective resistance.

So powerful was the attachment to this form of Prison Islam that two JIS devotees — members of rival gangs — were able to overcome past grievances, thus fusing JIS's spiritual identity to its gang history. While on parole, one of the devotees took the group's terrorist plot to the community and turned to a street gang for firearms. Additional members were recruited from the international jihad movement inspired by the war in Iraq. All the while, the JIS plot continued to be directed by its charismatic leader, who remained incarcerated in maximum-security custody.



James brought JIS's message to new inmates at Tehachapi, preaching that it was the duty of Muslims to violently attack enemies of Islam, including the U.S. government. He eventually took control of JIS and began distributing a handwritten document called the "JIS Protocol," which described his personal beliefs, including his justification for killing "infidels," and required prospective members to swear obedience to him and to keep the group's existence confidential. James spread the "JIS Protocol" through-

out the California prison system using smuggled letters — or "kites" — and other mail and phone calls initiated by his old gang, the 76th Street Crips. In 2003, he was transferred to the maximum-security California State Prison in Sacramento — also known as New Folsom Prison — where he continued to spread his protocol.

By 2004, James had developed a following of several dozen inmates. In November of that year, he met Levar Washington, a 25-year-old African-American, also from South Central Los Angeles, who had been sentenced to three years for robbery.

Washington was a member of the Rollin' Sixties Crips, an enemy gang of the 76th Street Crips, who had recently converted to Islam.[6] James directed Washington — who would be out on parole in a few weeks — to recruit five people without felony records from the community, acquire firearms and find people with explosives expertise once he was on parole.

The Sept. 11 Plot of 2005

Six months later, in May 2005, Washington returned to South Central Los Angeles, where he recruited 21-year-old Gregory Patterson, an African-American who had recently converted to Islam, and 21-year-old Hammad Samana, a Pakistani who taught Arabic at a local mosque. Neither had criminal records.

James' plan was to attack a target symbolic of the Iraq war: a U.S. Army recruiting office. The planned date of the attack was also symbolic: four years to the day after the Sept. 11 attacks. The men began a spree of gas station robberies to fund their efforts. The group planned its activities from an apartment in South Central Los Angeles. Yet unlike other post-Sept. 11 plots, the JIS attack was directed from prison — James was calling the shots.

Although JIS's goal was "to die for Allah in a jihad,"[7] the members' criminal skills did not match their ideological fervor. On June 5, 2005, investigators from the Torrance (Calif.) Police Department received a tip concerning the recent robberies. In one of the heists, a robber had left his cell phone at the scene, ultimately leading to the indictment of James and the three men.

The indictments led to a combined state and federal investigation of radical Islamic prison gangs in California, which found that JIS still had a presence in the state's correctional system.

A Closer Look at Radicalization

In the NIJ-funded study, I asked prison chaplains, gang intelligence officers and prisoners open-ended questions about the number and types of non-Judeo-Christian faith groups within the prison systems and the conversion process, including motivations for converting.

Two-thirds of the 30 inmates in the study belonged to prison gangs, and most of them had been in street gangs before incarceration. Each had experienced some sort of prison conversion, be it to Islam (traditional and American versions), Black Hebrew Israelism, Buddhism, Native American faiths, Hinduism, Christian Identity, Odinism or Wicca. Several prisoners were affiliated with JIS at New Folsom Prison.

Here are the study's main findings.

Why Prisoners Convert

Although some of the 30 prisoners converted because of the need for protection, the primary motivation I found was spiritual "searching" — seeking religious meaning to interpret and resolve discontent.[8]

The prisoners took on several new roles in their quest for meaning and identity. Among the prisoners I interviewed, it was not unusual for a young African-American prisoner who began his incarceration with no religious affiliation to start attending Baptist services in the chapel, convert to the Nation of Islam, and then convert to Black Hebrew Israelism and finally to Sunni Islam. Many reported that their conversions

were inspired not only by sacred texts, rituals and practices but also by literature, hip-hop music and the media.

The study confirms the important role social networks play in how people are recruited into new religious movements.[9] The prisoners I interviewed typically converted to non-Judeo-Christian religions upon the advice of their parents, cell mates and fellow gang members. My research revealed that although some inmates may be inspired by foreign terrorist organizations like al-Qaeda, these groups were not directly involved in the radicalization process.

How Conversion Affects Behavior

The chaplains I interviewed maintained that for the overwhelming majority of inmates who convert to non-Judeo-Christian faiths, the experience increases self-discipline and helps them interact in a positive way with other inmates and staff, thereby making a meaningful contribution to their rehabilitation.[10]

"After they are here for a while, some inmates come to understand the need for a higher power," said one of the chaplains. "Some start studying and eventually they convert to a religion. You can see the difference almost immediately. You see the difference in their comportment, in their tolerance of others."

But the study also found the potential for ideologically inspired criminality, particularly in overcrowded maximum-security prisons where there are few rehabilitation programs, a shortage of chaplains to provide religious guidance and serious gang problems.[11] These prisons were more vulnerable to prisoner radicalization and terrorist groups that infiltrate, recruit and operate behind the walls.

The Gang Problem

The gang intelligence officers I interviewed agreed that most inmates are radicalized by other radical inmates and not by outside influences.

Prisoner radicalization grows in the secretive underground of inmate subcultures through prison gangs and extremist interpretations of religious doctrines that inspire ideologies of intolerance, hatred and violence.

The research found that radicalization was based on a prison gang model. Gang dynamics have become very complex in recent years, with members now crossing racial lines to increase their numbers for protection, often using religious "call-outs" — or spoken orders for prisoners to report to a service in the chapel — to meet and do gang business.

My interviews revealed that former rivals, like the Crips and the Bloods, have joined forces under Islamic banners. Some Neo-Nazis have become Sunni Muslims. Meanwhile, conflict within inmate Islam is growing as various factions of the faith compete for followers, pitting the Nation of Islam against Sunnis, Sunnis against Shiites, and Prison Islam — which encompasses gang values and fierce intra-group loyalties based on "cut-and-paste" interpretations of the Koran — against all the other forms of inmate Islam.

The men in the JIS case, in fact, acted like a prison gang. They not only had their own hierarchy, code of conduct and secret communication system, but also their own collective identity. This gave them a shared purpose and sense of camaraderie, leading to a form of collective resistance against the U.S. government. The gang intelligence officers I interviewed characterized JIS as a small, clandestine group that operated below the radar.

The Role of Charismatic Leaders

The study found that prisoners are radicalized through a process of one-on-one proselytizing by charismatic leaders. Charismatic leaders targeted the most vulnerable — inmates who had spent or will spend much of their lives incarcerated under maximum

security and who no longer had contact with family. Angry and embittered by their circumstances, these inmates often adopted anti-authoritarian attitudes and were easily pressed into a gang, where they met an inmate leader who promised hope. Indeed, I discovered that charismatic leadership was more important than other commonly cited factors associated with prisoner radicalization.

Radicalization and Terrorist Recruitment

The radicalization of prisoners is a problem unlike any other faced by correctional administrators today — or at any other time in history. It grows in the secretive underground of inmate subcultures through prison gangs and extremist interpretations of religious doctrines that inspire ideologies of intolerance, hatred and violence.

As discussed further in my final report, one of the veteran chaplains said, "Today's inmates are more dissatisfied with the government than they were 10 years ago or even 20 years ago. The seeds of dissatisfaction are everywhere. Inmates display more aggressive posturing. They cluster on the yard by religion. Racism is rampant. They find a new religion in prison [that] reinforces their opposition to authority. Some of these inmates are very fertile ground for jihad."

The fertile ground for radicalization — as the chaplain described — certainly does exist. However, my extensive literature review revealed that moving from radicalization to actual recruitment for terrorism is a rare event. Only a small percentage of converts to white supremacy groups and to Islam — primarily, fresh converts, the newly pious, with an abundance of emotion and feeling — turn radical beliefs into terrorist action.[12] Therefore, it seems reasonable to conclude that it is not the sheer number of prisoners following extremist interpretations of religious doctrines that poses a threat; rather, it is the potential for small groups of radicals to form support networks for terrorist goals upon release.[13]

Based on my research, here are some recommendations that may help address radicalization and terrorist recruitment in prison:

Hire chaplains. Budgets for religious services in correctional facilities across the country have recently been slashed, thereby creating opportunities for radical prisoners to operate on their own, independent of the oversight of chaplains who might help ensure moderation.[14] In California, there is one chaplain for every 2,000 inmates, and in some Texas prisons the ratio is one to 2,500.[15] Colorado and Virginia have completely cut their state prison chaplain systems.[16] It should be noted that the American Correctional Chaplains Association calls for one chaplain per 500 inmates.

Diversify corrections personnel. Islam is currently the fastest-growing religion among prisoners in the U.S.[17] Prisoners participating in the study reported that when there were not many Muslims on staff, Muslim inmates felt like "outsiders" and the conditions that support the growth of Prison Islam were strengthened. Hiring Muslim American guards, counselors, chaplains and especially wardens might help reduce this perceived outsider status.

Provide training. Staff training on the recruitment activities of gangs and shifting power relations among prisoners should be provided.

Increase our knowledge base. Agencies should continue to support research on the various facets of prison culture that lead to radicalization and terrorist recruitment,

About the Author

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asking such fundamental questions as: What role will prison overcrowding play? How would the elimination of prison chaplains impact the issue? And is it possible to create "radicalization-free zones" in prison?

NCJ 224085

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Medical Panel Issues Interim Findings on Stun Gun Safety

by John Morgan, Ph.D.

During the three-year period from 2003 to 2005, 47 states and the District of Columbia reported 2,002 arrest-related deaths to the Bureau of Justice Statistics' Deaths in Custody Reporting Program.[1] For many years, police leaders have sought alternatives to lethal force and better methods to subdue individuals to limit injuries and death.

Less-lethal devices have been used by law enforcement for decades; during the early 1990s, pepper spray became the less-lethal option of choice for law enforcement and corrections agencies. Although pepper spray is inherently safer than lethal-force options and may be preferable to blunt-force methods, many advocates were concerned that pepper spray was associated with in-custody deaths. The National Institute of Justice (NIJ) reviewed those cases and, in 2003, issued a report that found pepper spray was safe and effective.[2]

In recent years, electro-muscular-disruption technology — also known as conducted-energy devices (CEDs) or stun guns or by the trade name Taser® — has become the less-lethal device of choice for a growing number of law enforcement agencies. CEDs use a high-voltage, low-power charge of electricity to induce involuntary muscle contractions that cause temporary incapacitation. Industry reports suggest that approximately 11,500 law enforcement agencies around the country have acquired CEDs, with approximately 260,000 devices now deployed. In 2003, TASER International introduced the Taser X26®, the conducted-energy device most widely used by law enforcement today.

Although studies by law enforcement agencies have found that the deployment of CEDs reduced injuries to officers and suspects,[3] a significant number of individuals have died after CED exposure. Some were normal healthy adults; others were chemically dependent or had heart disease or mental illness. These deaths have given rise to questions from law enforcement and the public regarding the safety of CEDs.

Because many gaps remain in the body of knowledge with respect to the effects of CEDs, NIJ sponsored an independent research program to address the safety and effectiveness of CEDs and a study to address whether CEDs can contribute to or cause mortality and, if so, in what ways. An interim report on this study was recently released. *Deaths Following Electro Muscular Disruption* is available at http://www.ncjrs.gov/pdffiles1/nij/222981.pdf; a final report is expected in 2009.

The study is being conducted by an expert medical panel assembled by NIJ. The panel reviewed the full range of current scientific research, reviewed a number of CED-associated deaths and held substantive discussions with industry, academia and community advocates. At this time, many questions about the safety of CEDs cannot be answered based on current research, especially with respect to at-risk individuals. Nonetheless, although exposure to CEDs is not risk free, NIJ's medical panel found no conclusive medical evidence in current research that indicates a high risk of serious injury or death from the direct effects of CED exposure.

NIJ's Research Program

Prior to NIJ's involvement, most of the relevant research in this field had been industry sponsored. Although much of this prior work had been published in peer-reviewed journals, some questions had been raised about the influence of industry funding on the results. For its CED safety studies, NIJ funded researchers, physicians and other professionals who have never been employed by companies in the field, including TASER International, Inc.[4] Device manufacturers did cooperate with and provide important information to NIJ-sponsored researchers and studies.

NIJ's research program has included three main types of study. In general, physiological research provided a controlled way to examine the limits of CED exposure and how such exposure might affect at-risk populations, such as individuals with high body temperature or who were compromised by drug exposure.[5] Human subject testing was performed with police volunteers during training to determine the effects of CED exposure on healthy individuals, especially with respect to changes in heart function and blood chemistry. Field data collection provides information about how CEDs are used and how they affect a range of individuals in real-world settings. Some field data were retrospective, based on reconstruction of information in police reports. Other field data were collected by medical personnel soon after the use of CEDs by law enforcement.[6]

Although exposure to CEDs is not risk free, NIJ's medical panel found no conclusive medical evidence in current research that indicates a high risk of serious injury or death from the direct effects of CED exposure.

These studies have improved the understanding of the safety and effectiveness of CEDs. Researchers at the University of Wisconsin found that CEDs can directly "electrocute" the heart rhythm, although the chance of this happening is quite small.[7] Theoretically, this can happen only in individuals with very little distance from their skin surface to their pericardium, the sack around the heart muscle. Research published in 2007 shows that CEDs can cause heart fibrillation (a dangerously disturbed heart rhythm) in people with pacemakers, presumably because the CED shock can travel down the electrical leads of the pacemaker device.[8]

One concern with CEDs has been that they cause involuntary muscle contractions and thus might cause muscle breakdown, changes in blood chemistry, and perhaps resulting heart failure. Physiological testing has not shown significant signs that these problems actually occur.[9] CED exposure can cause a small, temporary increase in lactate, similar to what might be seen during moderate exercise. This result confirms industry studies.

The panel said that law enforcement need not refrain from deploying CEDs, provided the devices are used in accordance with accepted national guidelines.

Cases of Excited Delirium

Supporters of the use of CEDs attribute many in-custody deaths to a syndrome called excited delirium. Excited delirium is not a medical diagnosis, but a term describing people who may have psychosis or drug intoxication. These individuals may show great strength, agitation and violent behavior. Their body temperature will often be very elevated, to potentially lethal levels.

Law enforcement officers encounter suspects in excited delirium frequently and must use force to subdue them. People in excited delirium are at high risk of death even if they do not encounter a police officer and even if a CED or other weapon is not used against them. These individuals must be calmed and their body temperature reduced as soon as possible to avoid sudden death.

Although preliminary data from physiological studies suggest that CEDs may increase the risk of sudden death in cases of excited delirium, NIJ's study panel concluded in its interim report that CEDs do not directly cause death in excited delirium cases. The panel noted that this does not mean that CEDs are entirely ruled out from having a role in such deaths. Everything that happens to a person that causes excited delirium and stresses a person in excited delirium may be a contributing factor in his or her death, whether he or she ingested drugs or engaged in a physical struggle.

Many police departments are working with emergency medical responders to deal with excited delirium cases more effectively. In Dade County, Fla., responders have implemented protocols based on Canadian research to reduce the risk of death in these individuals. Interventions include sedation with the drug Versed and reduction in body temperature using chilled intravenous fluids. Although not recommending Dade County's protocol specifically, NIJ's interim report on in-custody deaths does support active intervention in excited delirium cases, which may include cooling, sedation and hydration.

The Panel's Recommendations

As stated earlier, the NIJ medical panel noted that, at this time, many questions about the safety of CEDs cannot be answered based on current research, especially with respect to at-risk individuals. The panel found, however, that there is no conclusive medical evidence to indicate a high risk of serious injury or death from the direct effects of CED exposure. In fact, field experiences in many police departments indicate that exposure is safe in the vast majority of cases.[10] Therefore, the panel said, law enforcement need not refrain from deploying CEDs, provided the devices are used in accordance with accepted national guidelines. (See *Electronic Control Weapons,* a model policy of the International Association of Chiefs of Police.[11])

The panel's interim report includes significant recommendations for post-event medical care and investigation of in-custody deaths. It is not possible, the panel said, to reach a definitive conclusion concerning the role of less-lethal devices in a death unless the relevant facts have been established about the incident and the decedent. The report also includes a bibliography of scientific papers that have been systematically reviewed for their relevance and quality. This bibliography represents an authoritative foundation for the inclusion or exclusion

About the Author

John Morgan is the Deputy Director for Science and Technology at the National Institute of Justice. He co-chaired the Steering Group of NIJ's study, *Deaths Following Electro Muscular Disruption.*

of CEDs in deaths. Although it does not include every possible source of information, the bibliography does represent a reliable set of information accepted by the NIJ medical panel.

NIJ's review of CED technology provides the needed basis for the appropriate use of these devices. The legitimacy of law enforcement is, in part, derived from the care taken in choosing technology to subdue or suppress individuals. NIJ plays an integral role in this process by developing knowledge about a wide range of technology and practice — including this recent interim report on conducted-energy devices — based on rigorous scientific research.

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For More Information

- Information on less-lethal technologies and NIJ's work in this area is available at http://www.ojp.usdoj.gov/nij/topics/technology/less-lethal/welcome.htm.

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Communicating Across State and County Lines: The Piedmont Regional Voice over Internet Protocol Project

by Philip Bulman

To officers in the Danville (Va.) Police Department, sometimes it seemed like suspects knew a little too much geography.

When being pursued, suspects would head straight for the state line, and in just a few minutes, speed into North Carolina. Because of incompatible radio systems, Danville officers unfortunately had no way to communicate directly with their colleagues across the border, complicating efforts to arrest the suspects.

To fix the problem and help improve public safety, the City of Danville teamed up with surrounding law enforcement agencies — the Caswell County Sheriff's Office in North Carolina, the North Carolina State Highway Patrol, the Pittsylvania County Sheriff's Office in Virginia and the Virginia State Police — to use Internet technology to bridge the gaps in their communications systems.

Each of the five jurisdictions participating in what became known as the "Piedmont Regional Voice over IP Pilot Project" was able to keep existing radio systems, avoiding costly replacements. The new communications link was provided by "Voice over Internet Protocol" (VoIP) systems, which convert voice signals into digital form, allowing them to travel over the Internet or private networks that use Internet technology before they are converted back to ordinary voice signals at the receiving end.

The National Institute of Justice (NIJ) provided technology support to the public safety agencies, and two vendors[1] donated equipment and services. Field tests show great improvement over previous conditions for participating officials. As Danville Chief of Police Philip Broadfoot said, "The technology works well. It's clear. It's effective. It's easy to use."

Communication Barriers

Police departments in the United States started using radios in the 1930s. Historically, they did not coordinate radio purchases with surrounding jurisdictions. Indeed, some agencies went out of their way to ensure that they used different frequencies as a courtesy to nearby police departments. They did not want to create radio interference problems for neighboring public safety agencies. In recent decades, neighboring police departments have started moving toward increased cooperation in radio communications.

Budgets also play a role in radio operations. According to Broadfoot, a wide disparity exists in the equipment used. Police departments use everything from state-of-the-art equipment to off-the-shelf hardware bought from a local electronics store.

Like the other agencies participating in the pilot project, the Danville police already had solid voice radio systems on their side of the state line. Patrol officers were frustrated, however, by their inability to talk to another officer who, although across the state line, was only a short distance away.

Take, for instance, when a suspect crossed into North Carolina's Caswell County. Danville police officers could communicate with neither the Caswell County Sheriff's Office nor the North Carolina State Highway Patrol (NCSHP). "If we needed to talk with them, it had to be by telephone," Broadfoot explained.

A Danville patrol officer would have to radio the Danville dispatcher, who would then pick up the telephone and call another dispatcher, who in turn would relay the information by radio. This arrangement delayed communications and increased the risk that important information might be garbled as it changed hands so many times.

To help overcome these barriers, Cisco Systems, Inc., a supplier of Internet networking equipment, worked with the participating law enforcement agencies to set up a VoIP system that connected the various police departments' existing land mobile radio networks to an interoperable Internet protocol network. The system allows communication using computers or standard radio equipment.

The new system also includes a dedicated connection between police dispatch centers. Dispatch personnel can now communicate directly with one another, and they can add more radio resources to the network as needed, using standard "patch" procedures with which they are already familiar. (See sidebar on this page, "What Is Voice over Internet Protocol?")

WHAT IS VOICE OVER INTERNET PROTOCOL?

An increasing number of businesses and consumers are using Voice over Internet Protocol (VoIP) as an alternative to standard telephone service. VoIP converts voice signals to a digital format, which allows the signals to travel over the Internet or private networks that use Internet technology. At the receiving end, they are converted back to ordinary voice signals. The technology — which can be used by standard computers — allows both voice and data to travel on the same networks. A variety of VoIP products are commercially available.

Open networks such as the Internet have inherent security problems, such as vulnerability to computer viruses, so most public safety organizations that adopt VoIP products elect to use private networks.

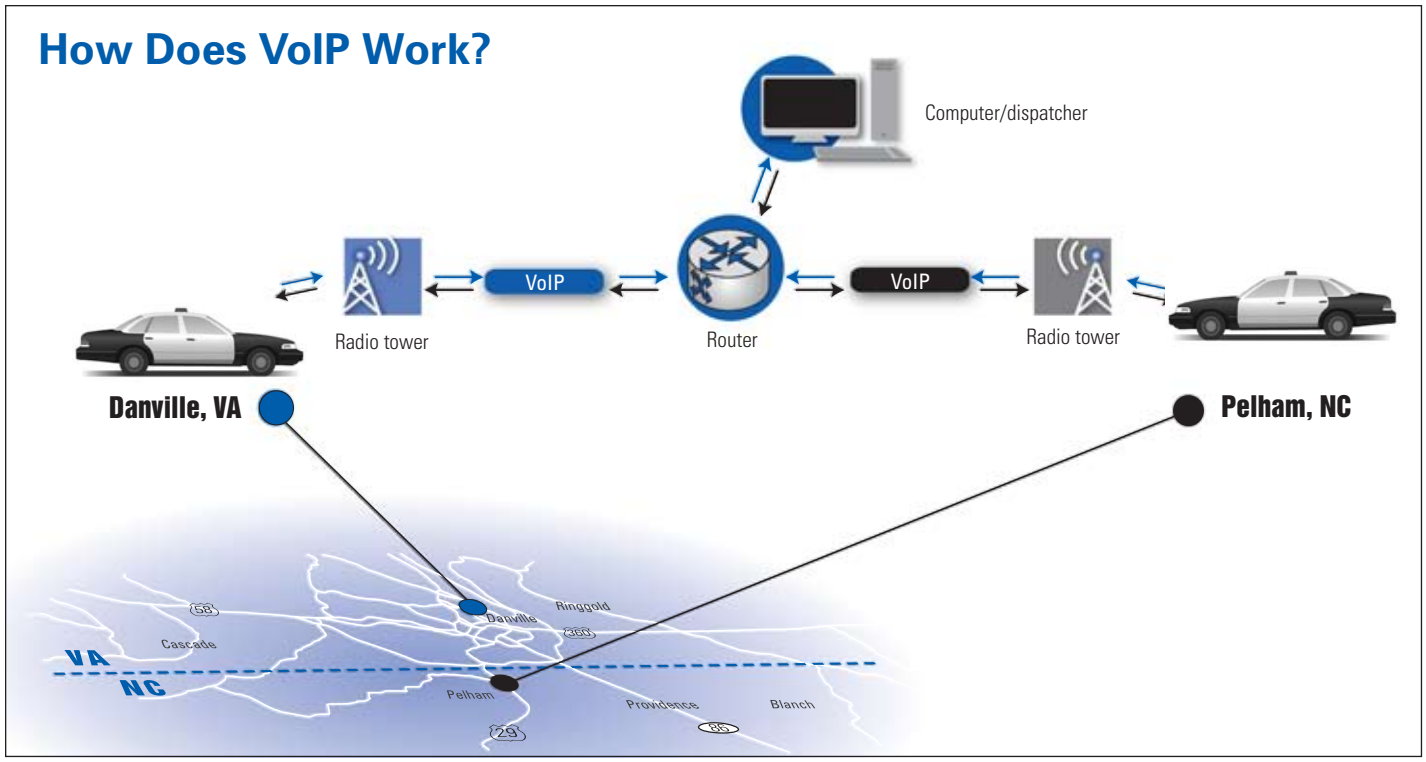
An NIJ fact sheet about VoIP is available at http://www.ojp.usdoj.gov/nij/topics/technology/communication/voip/welcome.htm.

Other fact sheets about police interoperability issues — including, for example, information on governance agreements among agencies and how radio spectrum works — are available at http://www.ojp.usdoj.gov/nij/topics/technology/communication/governance.htm.

Getting Everyone on Board

Although officers on both sides of the Virginia-North Carolina border wanted to work toward better communications among their agencies, they were protective of their radio operations because of security concerns. No police department wants to risk having its emergency communications system crash because of an unforeseen technical problem. According to Broadfoot, participants in the pilot project were initially wary.

To protect the integrity of their 9-1-1 centers, for example, many law enforcement agencies



put strict limitations on access to their communications systems, and they are leery of companies with which they do not normally do business. This pilot project forged communications links by using equipment that had not previously been used in a law enforcement setting.

"That took a big leap of faith for these folks," Broadfoot said.

Also, with five agencies using radios from different vendors, it appeared to some that linking the systems would be difficult. "It becomes quite a project to convince people that it can be done," Broadfoot noted. Luckily, he added, law enforcement agencies are accustomed to working together: "When you look at the chiefs and sheriffs, they're saying, 'We're all in this for public safety.'"

Jeff Frazier, director of the Internet Business Solutions Group at Cisco Systems, said that one thing company officials underestimated was the difficulty of simply getting radio experts on board in a project that involved blending newer technologies with the radio networks that police departments have come to rely on and trust.

"We're bringing network technology into a radio world," Frazier said. "The people in the radio world see that as a big threat."

As everyone came to see this as an opportunity to take part in an innovative project, however, even the usual rivalries between private-sector companies decreased.

"I thought it was great," Frazier said. "We have multiple organizations communicating in ways they never thought possible."

Speaking the Same Language

Allan Sadowski, the information technology manager for NCSHP, said one of the challenges involved in any interoperability project that combines radio systems with network Internet protocol systems is the different backgrounds of the technical people involved.

"The radio shops don't understand Internet protocol," Sadowski explained. Similarly, people who have worked extensively with telephone or Internet networks sometimes have little knowledge of radio. "They speak different languages," he said.

Sadowski recommends getting all technical people involved at the early stages of an interoperability project to help prevent misunderstandings and ensure that everyone is working well together.

Yet even when the technical people are working together, they might run into a roadblock caused by strict network security policies designed to protect police communications systems. For example, to avoid computer viruses, hacking and other threats, NCSHP's private network is insulated from normal Internet traffic. Initially, it seemed impossible for the agency to keep its strict policy in place and still participate in the VoIP system. However, engineers created a break within the network that converted digital signals to analog voice signals and then sent them a short distance before reconverting them to digital signals. This process protected the private network from digital threats, such as intrusions by hackers and viruses, allowing NCSHP to take part in the project without violating its security policies.

Promising Results

Sadowski said patrol officers are pleased with the results of the project because now they can communicate across the state line when they need to. "They can talk to dispatchers immediately," he said. "With a few mouse clicks, officers are talking to officers. They love it."

Michael Welch, sheriff of Caswell County, said that the project has led to significant improvements, giving officers an option that many citizens thought they already had. "A lot of people didn't understand that we didn't have that ability to talk car-to-car," he said.

Officers have been pleased because it gives them more options and the possibility of getting more help in a variety of situations, Welch said. "It has been a real morale booster," he added.

Jim Davis, director of emergency management and communications in Pittsylvania County, said that although the project seemed a bit daunting at first, the county communications team found it easy to do once they got started. Davis noted that the ability to add more communications links as needed is impressive. "I think it's going to be a great tool — and not just for law enforcement," he said.

Indeed, the project has already moved beyond law enforcement to a broader public safety setting, as the jurisdictions have added fire and emergency medical services to the network. The project is a step toward giving law enforcement agencies an alternative, assured communications network when other systems are not working.

Joseph Heaps, deputy chief of NIJ's Information and Sensors Technologies Division and program manager for the project, said this pilot has been valuable both because the technology works and because other public safety agencies can learn what obstacles they may face in similar efforts.

"Integrating commercial off-the-shelf equipment can improve interoperability among radio systems, but the process is not as straightforward as the vendors may lead you to believe," Heaps said. "Budgets for planning and additional customization may be required. But if the proper planning is done in advance, these solutions can offer cost-effective options for linking radio systems together and improving public safety communications."

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PIEDMONT PROJECT WINS IACP AWARD

The Piedmont Regional Voice over Internet Protocol Pilot Project won a 2007 Excellence in Technology Award from the International Association of Chiefs of Police. For more information on the award, see http://www.iacptechnology.org.

Note

1. Cisco Systems, Inc., and Raytheon JPS Communications.

About the Author

Philip Bulman is a writer and editor at the National Institute of Justice. He has 25 years of experience as a journalist and writer specializing in science policy, scientific research and technology development.

Interagency Coordination: Lessons Learned From the 2005 London Train Bombings

by Kevin J. Strom, Ph.D., and Joe Eyerman, Ph.D.

Editor's Note: This is the second in a two-part series on interagency coordination that examines the response to the 2005 London bombings. In Issue 260 of the *NIJ Journal,* the authors identified promising practices in London's multiagency response. In this article, they discuss in more detail the challenges faced by British agencies in responding to the attacks and lessons that may be learned from them.

In July 2005, terrorists carried out the first suicide attacks in modern Western Europe. At 8:50 a.m., bombs went off on three London Underground trains. A fourth bomb was detonated a short time later on a double-decker bus. The attacks were the deadliest in London since World War II, killing 52 people and injuring more than 700 others.

London agencies responding to the bombings faced a number of challenges, which were, in part, driven by the virtually simultaneous nature of the attacks. Initial reports about the source of the explosions ranged from a train derailment to a body on the tracks to a power surge in the London Underground system.[1] Passengers fled from multiple station exits, causing further confusion about the number of attack sites.

As part of a National Institute of Justice-funded study, we interviewed officials directly involved in responding to the July 2005 bombings, including law enforcement, fire and medical services, and public health authorities. We found that although protocols followed by the multiple agencies that responded to the attacks largely minimized major problems, communication, leadership and legal difficulties did affect the coordination efforts.[2]

The primary issues reported to us during our interviews related to communication and leadership.

Coordination Challenges

One of the biggest challenges faced by the London agencies was how to communicate with the victims' families.[3] Family members and friends found it difficult to get information on the status and location of injured or deceased loved ones — so the Metropolitan Police Service (MPS) set up a family assistance center on the day following the bombings.

Responders also encountered problems with radio communications. Although the radio systems used by the British Transport Police and London Underground staff worked in the subway tunnels, the radios of other responding agencies, including MPS, did not. The interoperability of radios — the ability of radio systems to work in all settings and across all agencies — is technically a communications problem; however, leadership is crucial in developing and testing cross-agency systems prior to an emergency. According to the authorities we interviewed, solutions to the radio interoperability problems were being worked on at the time of the bombings; they had not, however, been fully implemented. (For more information on NIJ's interoperability portfolio, see page 32.)

Failures in leadership can also contribute to coordination-related problems, especially when attacks occur in three different police jurisdictions, as was the case with the London bombings. Shortly after the attacks, the City of London Police, which is responsible for the Square Mile in the center of London, restricted cell phone network access to specific users to reduce network traffic and improve first responder access. This had the unintended consequence, however, of cutting off access for many responding agencies, including the London Ambulance Service. The London Ambulance Service was able to communicate using alternate means, and no major harm resulted from the restriction. Nonetheless, this example underscores the need for planning among agencies.

Legal issues further complicated the multiagency response. Concerns over privacy laws initially kept authorities from sharing information with bombing survivors and their families. The United Kingdom's Data Protection Act prohibits sharing personal data without the consent of those concerned, thus limiting what information officials could give agencies and families on the identity and status of victims. American public health offices have raised similar concerns about our Health Insurance Portability and Accountability Act (HIPAA) and how these regulations could affect communication and information sharing with other agencies, including law enforcement.[4]

Failures in leadership can contribute to coordination-related problems, especially when attacks occur in three different police jurisdictions, as was the case with the 2005 London bombings.

Applying Lessons Learned

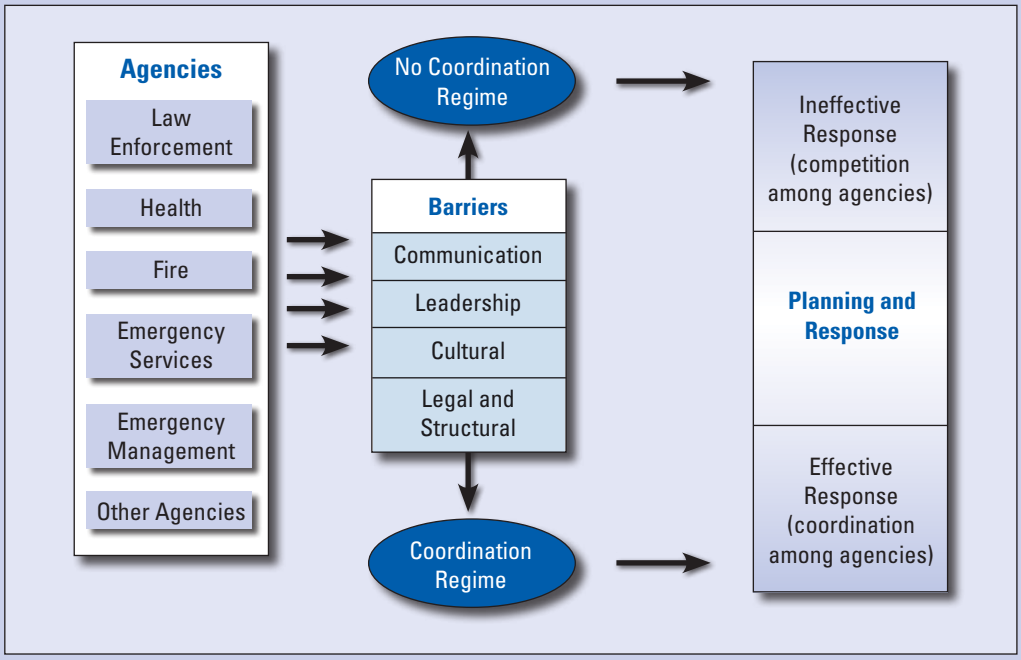
London officials learned valuable lessons regarding the multiagency response to the July 2005 bombings. We found that the flexibility of London's protocols for interagency coordination helped minimize major problems in emergency coordination. London officials had established relationships with one another and had practiced agreed-upon procedures. Consequently, a command and control system was up and running quickly, there was limited confusion about agencies' roles and responsibilities, and a unified message was delivered to the media.[5]

According to British expert Peter Simpson, a participant in our study, the city continues to improve its procedures for interagency command and control, communication and planning across agencies, and joint training (see sidebar, "Analyzing Multiagency Activities in the U.K.," on page 31). British legislation, such as the Crime and Disorder Act of 1998 and the Civil Contingencies Act, provide a foundation for multiagency partnerships. The Crime and Disorder Act requires local agencies, including the police and public health authorities, to work together to

IMPROVING MULTIAGENCY RESPONSE

When analyzing London's response to the 2005 bombings (see main story), we used a general coordination model that we developed in previous research.[6] The model provides a conceptual summary of the process, depicting benefits of multiagency coordination and common barriers encountered. It offers a first step in developing evidence-based solutions to improve coordination, including the development of performance metrics.

Agencies can minimize the common barriers to effective coordination by developing self-regulating, long-term processes — or "coordination regimes" — that facilitate working together in preparation and response activities. Failure to develop effective processes for working across agencies prior to an emergency event can result in competition across agencies, which, in turn, can lead to an ineffective joint response.



Future work would continue to define this model and apply it to multiagency-based systems that exist currently in U.S. jurisdictions. This could include, for example, evaluating which types of barriers are most common within and across jurisdictions as well as the most effective solutions used for solving these problems.

develop crime prevention strategies; the Civil Contingencies Act establishes clear roles and responsibilities for agencies involved in emergency preparation and response. To further improve response, a review of the Civil Contingencies Act currently under way will define a set of performance standards for local responders; create a performance management agreement, which includes capturing and sharing performance data; and devise an intervention strategy for poorly performing organizations.

The experience in London offers important guidance to U.S. agencies. But before we attempt to apply any lessons learned to the U.S., there are certain factors that should be considered. First, we must recognize the long history of disaster response in which London's coordination approach is rooted. This includes extensive bombings of the city during World War II and the Irish Republican Army's campaign of violence in the 1970s and 1980s. In both cases, incidents were too extensive to be addressed by a single agency.

ANALYZING MULTIAGENCY ACTIVITIES IN THE U.K.

by Peter Simpson

To analyze gaps in multiagency coordination, agencies in the U.K. are using an approach that maps actual and desired responses to a range of threats across agencies. This approach — which has been used for the 2004 Olympics, security for the Caribbean Community and U.K. terrorism response planning activities — provides a broad framework for risk assessment that can help inform future response efforts.

Each agency's response strategies are captured and recorded — or mapped — simultaneously. The subsequent "map" provides data that can be used to develop agreed-upon policies and procedures, such as triggers for mutual aid and areas of "tolerable" risk. Agencies can identify roles and best practices and develop performance benchmarks. Perhaps most significant, agencies can also collectively identify gaps or redundancies in activities, which they can then address.

The process provides a high-level analysis and evaluation of multiagency response systems across civilian and military, local and national levels.

About the Author

Peter Simpson spent 30 years as a senior officer in the London Fire Brigade, his last three years seconded to the Metropolitan Police Counter Terrorism Command. He is a visiting fellow of Cranfield University's Defence College of Management and Technology and the U.K.'s leading expert in multiagency activity analysis. Simpson was an active participant in RTI International's London project discussed in the main article.

The size of a jurisdiction and the number and type of agencies within that jurisdiction are also critical. For example, the U.K. has 43 local police agencies, compared to more than 17,000 in this country. Cross-agency responses in the United States may also need to be coordinated at federal, state and local levels. The public safety and research communities must work together to better understand how the characteristics of local jurisdictions affect response capacity and to identify and implement protocols that contribute to successful coordination.

Next Steps

Based on our research and lessons learned from the multiagency response to the London bombings, we believe that the first step in preparedness planning involves evaluating how well agencies coordinate with one another. To begin the evaluation, we should develop baseline measures in every community. The measurements will help policymakers identify which communities need to improve their coordination before a crisis occurs.

Terrorism — like the 2005 bombings in London — is a complex problem that requires multiagency solutions. Failure to communicate among agencies and plan in advance can lead to an inferior response. Working together regularly can help agencies understand each other's roles, sustaining long-term partnerships and improving future response to emergency situations.

NCJ 224088

About the Authors

Kevin J. Strom is a senior scientist in RTI International's Crime, Violence, and Justice Research Program. He has 12 years of experience in criminal justice research, including law enforcement responses to community violence and interagency coordination in response to terrorism.

Joe Eyerman is a senior research methodologist and director of the Health Security Program at RTI International. He has 17 years of experience with quantitative and qualitative modeling and analysis of social behavior; his primary research interest is in the formal and statistical modeling of decision processes related to individual and organizational political behavior, violence and terrorism.

Notes

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2. See Strom, K.J., and J. Eyerman, "Interagency Coordination: A Case Study of the 2005 London Train Bombings," *NIJ Journal* 260 (July 2008): 8-11.
3. U.K. Home Office, *Addressing Lessons;* London Regional Resilience Forum, *Looking Back, Moving Forward. The Multi-Agency Debrief: Lessons Identified and Progress Since the Terrorist Events of 7 July 2005,* London: Government Office for London, 2006, available at http://www.londonprepared.gov.uk/downloads/lookingbackmovingforward.pdf.
4. Eyerman, J., and K.J. Strom, *A Cross-National Comparison of Interagency Coordination Between Law Enforcement and Public Health,* final report submitted to the National Institute of Justice, Washington, DC: February 2006 (NCJ 212868), available at http://www.ncjrs.gov/pdffiles1/nij/grants/212868.pdf.
5. Strom, "Interagency Coordination."
6. Eyerman, *A Cross-National Comparison.*

Resources for Practitioners

Bridging the Communications Gap

The National Institute of Justice (NIJ) is working to help public safety officials communicate seamlessly across agencies and jurisdictions so they can effectively coordinate and respond to emergency situations.

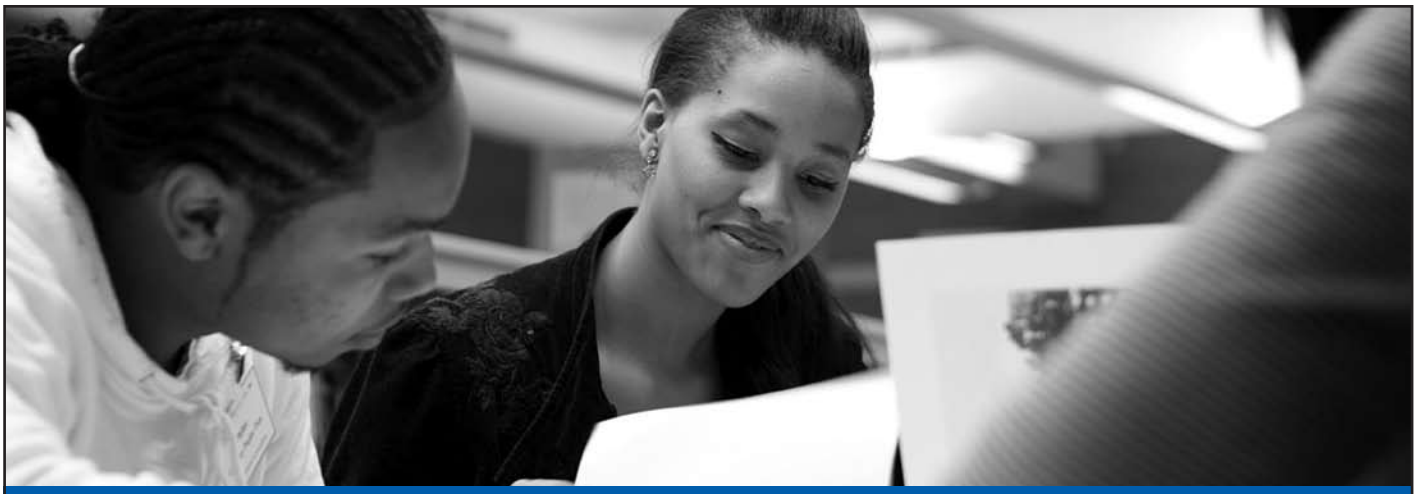
NIJ competitively selected four Centers of Excellence to join the National Law Enforcement and Corrections Technology Center (NLECTC) system. The Communications Technologies Center of Excellence is one of these centers. For more information, see http://www.justnet.org/coe_commtech/Pages/home.aspx.

Here is a brief summary of some of NIJ's communications technology projects:

- **Research and development.** Ongoing research in cognitive radio for public safety applications; evaluation of Voice over Internet Protocol in a real-world setting; and prototype development of software defined, multiband conventional emergency radio that complies with public safety communication standards.
- **Technology assistance.** Assistance, advice and support of tactical operations on communications technology-related issues through the NLECTC system.
- **Software Defined Radio Forum.** Work with the Software Defined Radio Forum's Public Safety Special Interest Group.

  The Forum published a 2007 report on how software defined and cognitive radio could be used in situations like the 2005 London train bombings. For more information, see http://www.sdrforum.org.
- **Standards.** Supporting the development of standards to facilitate the introduction of software defined and cognitive radio technology into the market.
- ***InShort* series.** Fact sheets on public safety communications interoperability topics.

http://www.ojp.usdoj.gov/nij



NIJ Graduate Research Fellowship Program

As part of its mission to provide objective, independent, evidence-based knowledge to meet criminal justice challenges, the National Institute of Justice (NIJ) supports dissertation research through its annual Graduate Research Fellowship Program.

The Institute awards research grants of up to $20,000 to universities to support doctoral students from any academic discipline whose original research has direct implications for crime and justice.

Who Is Eligible?
Only U.S. institutions of higher education (including tribal institutions) may apply. Foreign governments, foreign organizations and foreign institutions of higher education are not eligible to apply. NIJ seeks applications from accredited universities to support students who have completed, or are near completion of, all Ph.D. degree requirements except the research, writing and final defense of a dissertation.

What Is Not Funded?
- Proposals primarily to purchase equipment, materials or supplies
- Training or direct services
- Work that may be funded under another solicitation
- Direct or indirect administrative expenses of the university

Deadline
The deadline for applying for funding is 11:59 p.m. EST, November 21, 2008. All applications must be submitted through http://www.grants.gov.

NIJ's Current Priority Topic Areas
NIJ encourages a variety of approaches and perspectives in its research programs, which include:

- Biometrics
- Corrections
- Crime prevention and causes of crime
- Criminal and juvenile justice systems
- Criminal justice courts, prosecution and defense
- Drugs, alcohol and crime
- Evaluation research
- Forensic DNA
- General forensics
- Law enforcement and policing
- Less-lethal technologies
- Offender programs and treatment
- Operations research
- Personal protective equipment
- Pursuit management technologies
- Transnational crime and justice
- Violence and victimization

Up to 10 awards may be made during the year, depending upon the availability of funds and the number of high-quality applications. All NIJ awards are subject to the availability of appropriated funds and to any modifications or additional requirements that may be imposed by law.

For More Information

http://www.ojp.usdoj.gov/nij/funding/graduate-research-fellowship

Teen Dating Violence: A Closer Look at Adolescent Romantic Relationships

by Carrie Mulford, Ph.D., and Peggy C. Giordano, Ph.D.

Most teenagers do not experience physical aggression when they date. However, for one in 10 teens, abuse is a very real part of dating relationships.

According to the 2007 Youth Risk Behavior Survey, approximately 10 percent of adolescents nationwide reported being the victim of physical violence at the hands of a romantic partner during the previous year.[1] The rate of psychological victimization is even higher: Between two and three in 10 reported being verbally or psychologically abused in the previous year, according to the National Longitudinal Study of Adolescent Health.[2]

As for perpetration rates, there are currently no nationwide estimates for who does the abusing, and state estimates vary significantly. In South Carolina, for example, nearly 8 percent of adolescents reported being physically violent to a romantic partner. Interestingly, the rates of reported victimization versus perpetration in the state were similar for boys and girls.[3] However, when it comes to severe teen dating violence — including sexual and physical assault — girls were disproportionately the victims.[4]

At a recent workshop on teen dating violence, co-sponsored by the U.S. Departments of Justice (DOJ) and Health and Human Services (HHS), researchers presented findings from several studies that found that girls and boys perpetrate the same frequency of physical aggression in romantic relationships. This finding was at odds with what practitioners attending the workshop said they encounter in their professional experience. Most of the practitioners in attendance — representing national organizations, schools and victim service community-based agencies — said that they primarily see female victims,

and when they discuss teen dating violence with students, they hear that boys are the primary perpetrators.

So what *is* the reality?

Because teen dating violence has only recently been recognized as a significant public health problem, the complex nature of this phenomenon is not fully understood. Although research on rates of perpetration and victimization exists, research that examines the problem from a longitudinal perspective and considers the dynamics of teen romantic relationships is lacking. Consequently, those in the field have to rely on an *adult* framework to examine the problem of teen dating violence.

However, we find that this adult framework does not take into account key differences between adolescent and adult romantic relationships. And so, to help further the discussion, we offer in this article a gender-based analysis of teen dating violence with a developmental perspective.[5] We look at what we know — and what we don't know — about who is the perpetrator and who is the victim in teen dating violence. We also discuss how adult and adolescent romantic relationships differ in the hope that an examination of existing research will help us better understand the problem and move the field toward the creation of developmentally appropriate prevention programs and effective interventions for teenagers.

Victims and Perpetrators: What the Research Says

In 2001-2005, Peggy Giordano and her colleagues at Bowling Green State University interviewed more than 1,300 seventh, ninth and 11th graders in Toledo, Ohio. [*Editor's Note:* Giordano is one of the authors of this article.] More than half of the girls in physically aggressive relationships said both they and their dating partner committed aggressive acts during the relationship. About a third of the girls said they were the sole perpetrators, and 13 percent reported that they were the sole victims. Almost half of the boys in physically aggressive relationships reported mutual aggression, nearly

Because teen dating violence has only recently been recognized as a significant public health problem, the complex nature of this phenomenon is not fully understood.

half reported they were the sole victim, and 6 percent reported that they were the sole perpetrator.[6]

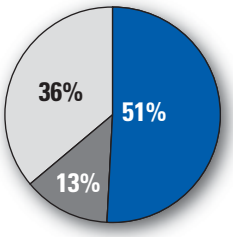
These findings are generally consistent with another study that looked at more than 1,200 Long Island, N.Y., high school students who were currently dating. In that 2007 survey, 66 percent of boys and 65 percent of girls who were involved in physically aggressive relationships reported mutual aggression.[7] Twenty-eight percent of the girls said that they were the sole perpetrator; 5 percent said they were the sole victim. These numbers were reversed for the boys: 5 percent said they were the sole perpetrator; 27 percent the sole victim.

In a third study, teen couples were videotaped while performing a problem-solving task. Researchers later reviewed the tapes and identified acts of physical aggression that occurred between the boys and girls during the exercise. They found that 30 percent of all the participating couples demonstrated physical aggression by both partners. In 17 percent of the participating couples, only the girls perpetrated physical aggression, and in 4 percent, only the boys were perpetrators.[8] The findings suggest that boys are less likely to be physically aggressive with a girl when someone else can observe their behavior.

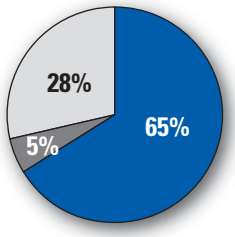
Considered together, the findings from these three studies reveal that frequently there is mutual physical aggression by girls and boys in romantic relationships. However, when it comes to *motivations* for using violence and the consequences of being a victim of teen dating violence, the differences between the sexes are pronounced. Although both boys and girls report that anger is the primary motivating factor for using violence, girls also commonly report self-defense as

Who Perpetrates Teen Dating Violence?

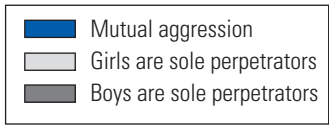
How girls in physically aggressive relationships see it



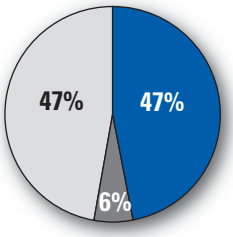
Source: Toledo Adolescent Relationship Study



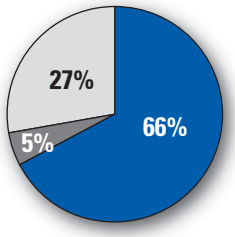
Source: Suffolk County Study of Dating Aggression in High Schools



How boys in physically aggressive relationships see it

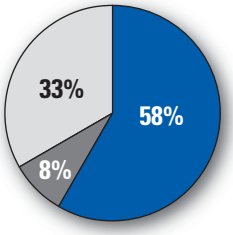


Source: Toledo Adolescent Relationship Study



Source: Suffolk County Study of Dating Aggression in High Schools

What is observed in physically aggressive couples



Source: Oregon Youth (Couples) Study

a motivating factor, and boys also commonly cite the need to exert control.[9] Boys are also more likely to react with laughter when their partner is physically aggressive.[10] Girls experiencing teen dating violence are more likely than boys to suffer long-term negative behavioral and health consequences, including suicide attempts, depression, cigarette smoking and marijuana use.[11]

Applying Adult Perspectives to Teen Dating Violence

Why do teenagers commit violence against each other in romantic relationships? We have already touched on the existing body of research on perpetration and victimization rates. Yet there is not a great deal of research that uses a longitudinal perspective or that considers the dynamics of teen romantic relationships. As a result, practitioners and researchers in the field tend to apply an adult intimate partner violence framework when examining the problem of teen dating violence.

A split currently exists, however, among experts in the adult intimate partner violence arena, and attendees at the DOJ-HHS teen dating workshop mirrored this divide.

Some experts hold that men and women are mutually combative and that this behavior should be seen as part of a larger pattern of family conflict. Supporters of this view generally cite studies that use "act" scales, which measure the number of times a person perpetrates or experiences certain acts, such as pushing, slapping or hitting. These studies tend to show that women report perpetrating slightly more physical violence than men.[12] It is interesting to note that most studies on teen dating violence that have been conducted to date have relied primarily on "act" scales.

Another group of experts holds that men generally perpetrate serious intimate partner violence against women. They contend that men in patriarchal societies use violence to exert and maintain power and control over women.[13] These experts also maintain that "act" scales do not accurately reflect the nature of violence in intimate relationships because they do not consider the degree of injury inflicted, coercive and controlling behaviors, the fear induced, or the context in which the acts occurred.[14] Studies using "act" scales, they contend, lack information on power and control and emphasize the more common and relatively minor forms of aggression rather than more severe, relatively rare forms of violence in dating and intimate partner relationships.[15] Instead, supporters of this perspective use data on injuries and in-depth interviews with victims and perpetrators.[16]

We believe, however, that applying either of these adult perspectives to adolescents is problematic. Although both views of adult intimate partner violence can help inform our understanding of teen dating violence, it is important to consider how adolescent romantic relationships differ from adult romantic relationships in several key areas.

How Teen Dating Violence Differs: Equal Power

One difference between adolescent and adult relationships is the absence of elements traditionally associated with greater male power in adult relationships.[17]

Because most abusive teen dating relationships are characterized by mutual aggression, prevention efforts must be directed toward both males and females, and interventions for victims should include services and programming for boys and girls.

Adolescent girls are not typically dependent on romantic partners for financial stability, and they are less likely to have children to provide for and protect.

The study of seventh, ninth and 11th graders in Toledo, for example, found that a majority of the boys and girls who were interviewed said they had a relatively "equal say" in their romantic relationships. In cases in which there was a power imbalance, they were more likely to say that the female had more power in the relationship. Overall, the study found that the boys perceived that they had less power in the relationship than the girls did. Interestingly, males involved in relationships in which one or both partners reported physical aggression had a perception of less power than males in relationships without physical aggression. Meanwhile, the girls reported no perceived difference in power regardless of whether their relationships included physical aggression.[18]

It is interesting to note that adults who perpetrate violence against family members often see themselves as powerless in their relationships. This dynamic has yet to be adequately explored among teen dating partners.[19]

Lack of Relationship Experience

A second key factor that distinguishes violence in adult relationships from violence in adolescent relationships is the lack of experience teens have in negotiating romantic relationships. Inexperience in communicating and relating to a romantic partner may lead to the use of poor coping strategies, including verbal and physical aggression.[20] A teen who has difficulty

expressing himself or herself may turn to aggressive behaviors (sometimes in play) to show affection, frustration or jealousy. A recent study in which boys and girls participated in focus groups on dating found that physical aggression sometimes stemmed from an inability to communicate feelings and a lack of constructive ways to deal with frustration.[21]

As adolescents develop into young adults, they become more realistic and less idealistic about romantic relationships. They have a greater capacity for closeness and intimacy.[22] Holding idealistic beliefs about romantic relationships can lead to disillusionment and ineffective coping mechanisms when conflict emerges.[23] It also seems reasonable to expect that physical aggression may be more common when adolescents have not fully developed their capacity for intimacy, including their ability to communicate.

The Influence of Peers

We would be remiss to try to understand teen behavior and not consider the profound influence of friends. Peers exert more influence on each other during their adolescent years than at any other time.[24] Research has confirmed that peer attitudes and behaviors are critical influences on teens' attitudes and behaviors related to dating violence.[25]

Not only are friends more influential in adolescence than in adulthood, but they are also more likely to be "on the scene" and a key element in a couple's social life. In fact, roughly half of adolescent dating violence occurs when a third party is present.[26] Relationship dynamics often play out in a very public way because teens spend a large portion of their time in school and in groups. For various reasons, a boyfriend or girlfriend may act very differently when in the presence of peers, a behavior viewed by adolescents as characteristic of an unhealthy relationship. For example, boys in one focus group study said that if a girl hit them in front of their friends, they would need to hit her back to "save face."[27]

Conflict over how much time is spent with each other versus with friends, jealousies stemming from too much time spent with a friend of the opposite sex, and new romantic possibilities are all part of the social fabric of adolescence.[28] Although "normal" from a developmental perspective, navigating such issues can cause conflict and, for some adolescents, lead to aggressive responses and problematic coping strategies, such as stalking, psychological or verbal abuse, and efforts to gain control.

Where Do We Go From Here?

Adult relationships differ substantially from adolescent dating in their power dynamics, social skill development and peer influence. These factors are critical to understanding physical violence and psychological abuse in early romantic relationships and may help explain the similar perpetration rates among boys and girls suggested by current statistics.

All of this points to important implications for teen dating violence prevention and intervention strategies. Because girls engage in high levels of physical aggression and psychological abuse and most abusive relationships are characterized by mutual aggression, prevention efforts must be directed toward both males and females, and interventions for victims should include services and programming for boys and girls. Interventions must also distinguish between severe forms of violence that produce injury and fear and other more common abuse,

About the Authors

Carrie Mulford is a social science analyst at the National Institute of Justice. She has worked extensively with research on juvenile justice, teen dating violence, child abuse, elder mistreatment, enforcement of victims' rights laws, hate crime and situational crime prevention. Since 2006, she has been the coordinator of the Federal Interagency Workgroup on Teen Dating Violence, whose members contributed to this article.

Peggy Giordano is the Distinguished Research Professor of Sociology at Bowling Green State University. Her research centers on social relationship experiences during the adolescent period, focusing particularly on studies of the nature, meaning and impact of friendships and romantic relationships.

and they must respond with appropriate safety planning, mental health services, and criminal or juvenile justice involvement.

More research on traditionally gendered relationship dynamics — and the links to relationship violence — is also needed. For instance, some male behavior may stem from an attempt to emulate other males who they believe (not always accurately, as data show) are confident and "in charge." Further, nearly one in five adolescent girls reports having sex with a partner three or more years older. These girls are at increased risk of acquiring a sexually transmitted disease because they are less likely to use a condom — possibly a result of unequal power dynamics in these relationships.[29] This power imbalance might also increase their risk for violent victimization by older partners.

And finally, research on the extent to which teens involved in abusive relationships become involved in adult abusive relationships — whether as victims or perpetrators — is sorely needed. Many delinquent youth, for example, have a well-documented path of illegal behavior; this behavior peaks in adolescence and dramatically declines in early adulthood. A similar look at aggressive adolescent romantic relationships may help us better understand the possible progression from teen dating violence to adult intimate partner violence.

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ADDITIONAL CONTRIBUTIONS

Michele Lynberg Black, an epidemiologist at the Centers for Disease Control and Prevention (CDC), also contributed to this article. During her more than 20 years at CDC, Black has worked across a broad range of disciplines, including reproductive health, environmental health and violence prevention. She has also worked with the National Center for Injury Prevention and Control's Division of Violence Prevention since 2002, focusing on the areas of intimate partner violence, dating violence, sexual violence and family violence.

Notes

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Recently Released by NIJ

Geography and Public Safety Volume 1, Issue 3

The latest issue of the NIJ and Office of Community Oriented Policing Services crime-mapping newsletter, *Geography and Public Safety,* examines how the nationwide home-foreclosure crisis has affected crime, police practice and public policy. Articles include using geographic information systems to assess the impact of home foreclosures on national and local problems, using the "Broken Windows" theory to examine the subprime mortgage crisis, and creating positive change for depressed neighborhoods. The newsletter is available at http://www.cops.usdoj.gov/files/RIC/Publications/GPS-Vol1_iss3.pdf.

HOPE in Hawaii: Swift and Sure Changes in Probation

In 2004, a Hawaii circuit judge collaborated with law enforcement, local jail officials, probation officers, drug treatment professionals, prosecutors and defense counsel to implement Hawaii's Opportunity Probation with Enforcement (HOPE) program. High-risk probationers attended "warning hearings" and were told that probation rules would be strictly enforced. The court also assisted those who needed drug treatment, mental health therapy or other social services. The pilot programs have shown early success. This *InShort* is available at http://www.ncjrs.gov/pdffiles1/nij/222758.pdf.

Policing in Arab-American Communities After September 11

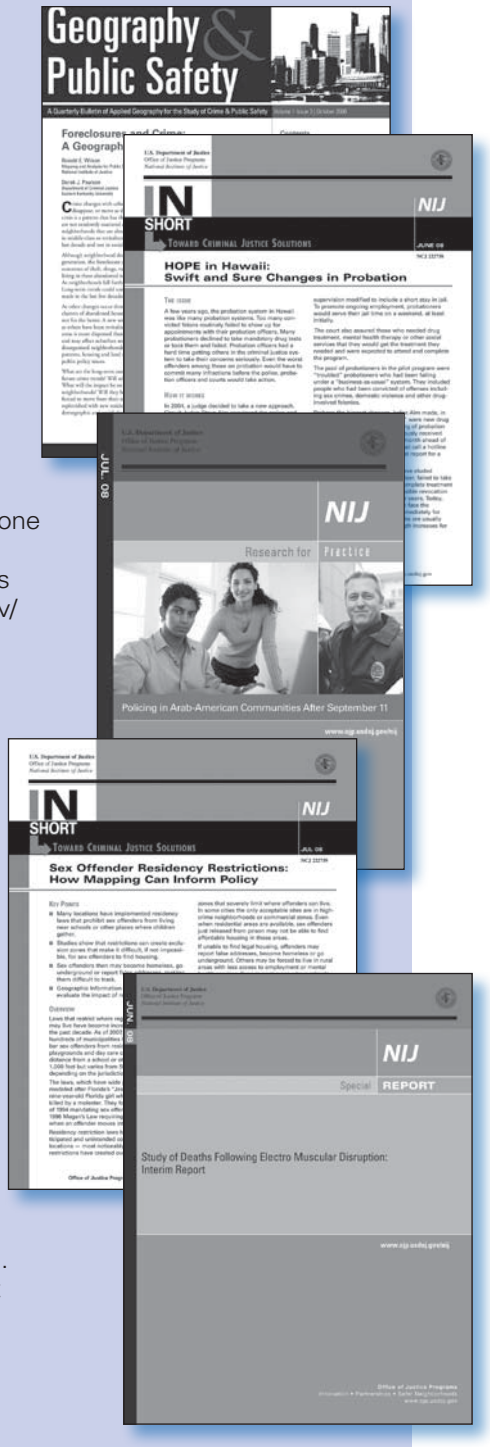
A recent NIJ study examined the effect of the Sept. 11 terrorist attacks on the relationship between law enforcement officers and residents in Arab-American neighborhoods. Researchers observed four significant obstacles to improved relationships: mutual distrust, a lack of cultural awareness among police officers, language barriers and residents' concerns about immigration status. The study offers promising practices for overcoming these obstacles. This *Research for Practice* is available at http://www.ncjrs.gov/pdffiles1/nij/221706.pdf.

Sex Offender Residency Restrictions: How Mapping Can Inform Policy

Studies show that residency laws limiting where sex offenders may live can create exclusion zones that make it difficult, if not impossible, for them to find housing. Sex offenders then may become homeless, go underground or report false addresses, making them difficult to track. Geographic information systems can help evaluate the impact of a residency law and whether a particular exclusion zone has adequate housing options for sex offenders. This *InShort* is available at http://www.ncjrs.gov/pdffiles1/nij/222759.pdf.

Study of Deaths Following Electro Muscular Disruption: Interim Report

Approximately 11,500 law enforcement agencies have acquired conducted-energy devices (CEDs). Although studies have indicated that CEDs reduce the use of deadly force and injuries to officers and suspects, a significant number of people have died after contact with one of these devices. NIJ formed a medical panel to examine these incidents and to review the current state of medical research on the effects of CEDs. This report presents the interim findings of the panel. The interim report is available at http://www.ncjrs.gov/pdffiles1/nij/222981.pdf.



Calming Down: Could Sedative Drugs Be a Less-Lethal Option?

by Danielle M. Weiss, J.D.

When law enforcement officers face a critical situation that puts innocent people at risk of injury or death, what options do they have to diffuse the situation and save lives?

Russian Special Forces faced just such a situation in October 2002, when 50 Chechen terrorists stormed a Moscow theater and held more than 800 civilians hostage with guns and explosives for nearly three days. Russian forces decided to use a gas to subdue the terrorists, leading to the release of hundreds of hostages. Unfortunately, at least 129 hostages died during the raid or in the following days. Some reports cited the effects of the gas — combined with the hostages' poor physical condition and inadequate medical treatment following the rescue — as contributing to the victims' cause of death.[1]

The siege of the Moscow theater raises questions for law enforcement in this country. Might calmative agents be a viable option for officers to safely and effectively respond to critical situations?

In April 2007, the National Institute of Justice (NIJ) convened a panel to discuss pursuing research on whether calmative agents — pharmaceuticals or sedative drugs that produce a calm or tranquil state[2] — might be an addition or alternative to law enforcement's current less-lethal options. NIJ drew on experts from the scientific, toxicological and bioethical communities; civil rights and advocacy organizations; and the legal and law enforcement communities to form this community acceptance panel.

The panel reached general consensus that law enforcement officers need additional less-lethal options and that pursuing new or updating existing research on the safety and viability of calmative agents was reasonable. Members agreed that further research would provide a better understanding of the

options, shortcomings and issues surrounding calmative agents. It is important to note that the panel did not determine *whether* a tool could be developed, only that further research was an appropriate next step.

As a result of the panel's recommendations, NIJ funded research to explore the potential of operationalizing calmatives and to examine possible pharmaceuticals, technologies and legal issues. The grant was given to Pennsylvania State University in 2007.

Limitations of Current Less-Lethal Devices

Every day, police officers across the country encounter people who pose a risk to the community and to themselves. It is paramount that officers have effective options to safely deal with these situations.

The U.S. law enforcement community currently uses conducted-energy devices (CEDs) — also known as electro-muscular-disruption devices or, more popularly, as stun guns — to subdue hostile, fleeing, belligerent or potentially dangerous suspects. CEDs transmit pulsating electrical signals through small probes that attach to a suspect's clothing or body. The signals interfere with communication between the brain and the muscular system, which results in temporary incapacitation. There is no conclusive evidence to date that CEDs cause serious injury or death when used properly and within national guidelines, but in some situations — such as a hostage situation — CEDs and other traditional less-lethal devices may not be suitable because they have a limited deployment range.[3] (For more information on the safety of CEDs, see a related story, "Medical Panel Issues Interim Findings on Stun Gun Safety," on page 20.)

In other situations, the use of less-lethal devices may raise concerns about the risk to police officers and suspects. For example, people on drugs who show symptoms of a state known as "excited delirium" frequently experience a spike in body temperature, increasing their risk of death. Concerns

In some critical situations, current less-lethal devices might not be suitable options for officers. Could calmative agents serve as an alternative tool for law enforcement to safely and effectively respond to these situations?

have been raised by law enforcement and the public about whether a shock from a CED — introduced when a suspect's body temperature is rising due to drug-induced excited delirium — could contribute to sudden death.

Less-lethal techniques that involve the use of blunt force may also pose risks; blunt trauma to a person can cause organ damage to the liver, kidneys, heart or brain, which could be permanent.[4]

Could calmative agents serve as an alternative to CEDs or blunt force for law enforcement when a hostile situation arises and officers are not in close proximity to the suspect — or when use of blunt force or a CED raises concerns about risks to those involved?

Research projects that examine the possibility of safely exposing someone to a pharmaceutical — even if it is for his or her own protection — raise issues that must be addressed. For example:

- What pharmaceutical would be appropriate?
- What would be an appropriate dosage when a suspect's medical history is unknown?
- Is an antidote or reversal agent available?
- What method(s) of delivery would be reasonable or appropriate: ingestion, inhalation, absorption through the skin or injection?
- Does a medically trained professional need to deliver the drug or could a law enforcement officer be trained to do this?

Considering the Issues: Which Drug?

A 2001 study conducted at Penn State examined the advantages and limitations of using calmative agents as a possible less-lethal option. According to the researchers, to be useful as a less-lethal option, a calmative agent ideally should:

- Have a fast onset.
- With a given dose, produce approximately the same magnitude of calm in people of similar body mass index and age range.
- Have a short or limited duration.
- Have reversible effects.
- Have no prolonged toxicity.
- Be easy to store and administer.[5]

In the study, researchers examined several classes of drugs that may have utility as a calming agent, such as opiates, antipsychotics, neurolept anesthesia, ketamine, benzodiazepines, rohypnol (date rape drug), and non-benzodiazepines (Ambien).[6] During a presentation to NIJ's community acceptance panel, one of the study's researchers highlighted the drug carfentanil as meriting further investigation. Carfentanil, which is used to sedate large animals, is delivered intramuscularly, intravenously and orally,

Books in Brief

The Delinquent Girl

Margaret A. Zahn, ed.
Temple University Press, 2009

During the past decade and a half, girls' involvement in the juvenile justice system has increased. Yet the topic remains understudied by criminologists. *The Delinquent Girl* identifies and analyzes the types of girls who become delinquent, the kinds of crimes they commit and the reasons they commit them. Contributors examine the major theories and explanations of female delinquency and consider the "gender gap" between male and female offenders. The book also provides an overview of the research on girls' delinquency, discusses policy implications and points to areas in which further research is needed.

Handbook of Biometrics

Anil K. Jain, Patrick Flynn and Arun A. Ross, eds.
Springer, 2008

Biometric recognition — using physical or behavioral characteristics (e.g., fingerprints, face, voice or hand geometry) to identify an individual — is a swiftly evolving science. The *Handbook of Biometrics* provides an overview of the technologies, applications and implementation of biometric systems. Researchers in the field discuss the basic concepts and traits as well as the latest advancements. The handbook is broken into three areas: individual biometric modalities, multibiometrics, and the deployment of biometrics in government and civilian applications. It also provides extensive bibliographies for the topical areas.

Handbook of Fingerprint Recognition

Davide Maltoni, Dario Maio, Anil K. Jain and Salil Prabhakar
Springer, 2003

Fingerprint recognition, despite its use in the forensics community for more than a century, still presents a complex and important pattern recognition problem. The *Handbook of Fingerprint Recognition* covers the most recent advances and practices in the field, including sensing, feature extraction and matching, synthetic fingerprint image generation, indexing, and multimodal systems. The authors discuss the major concepts, topics and security methods associated with fingerprint recognition systems. The handbook also includes a DVD containing the full versions of the FVC2002 and FVC2000 fingerprint databases and a demo version of SFinGe, software used for synthetic fingerprint image generation.

and it has known antidotes, naloxone or narcan. However, because carfentanil is an opioid, it can have some undesirable side effects, including respiratory depression, which can be fatal.

Additional drug options may be identified by looking to the pharmaceutical industry for already existing drugs or ones in the research pipeline.[7]

When Could Calmatives Be Used?

The circumstances in which a calmative agent could be used also must be thoroughly researched. Members of the NIJ community acceptance panel emphasized that the goal of using any type of agent identified through extensive research would be to improve the outcomes when using current less-lethal options. Different scenarios with different goals must be considered. For example, the general consensus of the panel was that calmatives would not be recommended as a dissursement option for peaceful protests or mass demonstrations. In these situations, they said, the potential risks would outweigh the intended goal.

In other circumstances — when a hostage situation becomes tactical, moving from verbal negotiations to force, for instance — the hostage-taker is often killed in the ongoing mission to protect the lives of innocents. The panel agreed that, if a less-lethal alternative became available that would spare the life of the hostage-taker as well, law enforcement would likely opt for it. Medical personnel, armed with sufficient amounts of an antidote, could be on site to handle any medical issues that arose. The ideal calmative, the panel noted, would put the hostage-taker to sleep or incapacitate him without harming nearby innocents. Once the situation was under the control of law enforcement and the suspect was in custody, the suspect could then be aroused in a safe environment, and proper medical treatment could be provided.

About the Author

Danielle Weiss holds a Juris Doctor and Master of Forensic Sciences. An associate with Booz Allen Hamilton, she serves as a consultant and technical advisor to the National Institute of Justice. She supports work on post-conviction DNA testing, forensic science training development, solving cold cases with DNA, and the National Missing and Unidentified Persons System (NamUs). Weiss has published a number of articles on the nexus of forensics and the law.

Several U.S. jurisdictions have medical protocols when dealing with suspects exhibiting signs of excited delirium. In Nashville, Tenn., for example, officers may call upon their medically trained brethren to administer the drug Versed when appropriate.[8,9]

Legal Considerations

NIJ's community acceptance panel also emphasized that when researching the possibility of using chemical agents in a law enforcement situation, some important legal considerations include the intended use of the agent, the appropriate dosage, the availability of an antidote and the involvement of medical personnel. The panel also noted that a number of international treaties, conventions, protocols or principles to which the U.S. is a party (such as the 1993 Chemical Weapons Convention, the 1907 Hague Convention, the 1925 Geneva Gas Protocol, the 1972 Biological Weapons Convention and the 1986 Nairobi Convention) would have to be considered.

Moving Forward With Research

In some critical situations, CEDs and other current less-lethal devices might not be suitable options for officers. NIJ's community acceptance panel focused its discussion on the very real need for alternative less-lethal tools and resources to help ensure the ongoing safety and protection of law enforcement officers, suspects and the community at large. Although there may or may not be a safe drug option available

to help officers deal with critical situations safely and effectively, the panel agreed that understanding the options, advantages and disadvantages surrounding chemical agents is important.

Research is the first step toward that understanding.

NCJ 224090

For More Information

- A summary of the community acceptance panel's discussion on researching calmative agents as a possible less-lethal option is available at http://www.ojp.usdoj.gov/nij/topics/technology/less-lethal/riot-control-agents.htm.

Notes

1. "Russia Names Moscow Siege Gas," BBC News, October 31, 2002, available at http://news.bbc.co.uk/2/hi/europe/2377563.stm; Miller, J., and E. Lichtblau, "U.S. Investigates Moscow Theater Siege, Seeking Qaeda Link," *New York Times,* November 19, 2003, available at http://query.nytimes.com/gst/fullpage.html?res=9E02E1DA163BF93AA25752C1A9659C8B63; McGeary, J., and P. Quinn-Judge, "Theater of War," *Time Magazine,* October 27, 2002; and "Gas 'Killed Moscow Hostages,'" BBC News, October 27, 2002, available at http://news.bbc.co.uk/2/hi/europe/2365383.stm.
2. Lakoski, J.M., W.B. Murray, and J.M. Kenny, *The Advantages and Limitations of Calmatives for Use as a Non-Lethal Technique,* University Park, Pa.: Pennsylvania State University, 2000: 7.
3. For example, an independent study commissioned by NIJ recently found that the Taser X26 missed the target a significant amount of times at 20 feet because of the probe's spread angle. Mesloh, C., M. Henych, L.F. Thompson, and R. Wolf, *A Qualitative & Quantitative Analysis of Conducted Energy Devices: TASER X26 vs. Stinger S200,* final report submitted to the National Institute of Justice, Washington, DC: May 2008 (NCJ 222769), available at http://www.ncjrs.gov/pdffiles1/nij/grants/222769.pdf.
4. Lakoski, *The Advantages and Limitations,* 11.
5. Ibid., 9-10.
6. Ibid., 15-16.
7. The pharmaceutical industry looks to these drugs because the development of a new drug can be time-consuming and costly. Approximately one out of every 10 pharmaceutical drugs in development proceeds to clinical trials. Once there, it can cost more than $1 billion and take eight to 10 years after chemical synthesis with no guarantee of approval by the FDA. Tufts Center for the Study of Drug Development, *Outlook 2008,* Boston: Tufts University, 2008, available at http://csdd.tufts.edu/InfoServices/OutlookPDFs/Outlook2008.pdf.
8. Metro Nashville Police Department, "Tasers to be Redeployed to Field Officers," press release, May 29, 2008, available at http://www.police.nashville.gov/news/media/2008/05/29a.htm; and Kalodimos, D., "I-Team: Injection Used to Subdue Prisoners," WSMV Nashville, Tenn., July 13, 2008, available at http://www.wsmv.com/news/16844880/detail.html.
9. In Miami-Dade County, in circumstances in which CEDs may need to be implemented but excited delirium is recognized, emergency medical services are notified so they can respond to a scene with law enforcement. Once the suspect is successfully subdued with the CED, medical personnel on site nasally administer Versed as part of medically necessary treatment. For more information on Miami-Dade's protocol, see related story, "Medical Panel Issues Interim Findings on Stun Gun Safety," on page 20.

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