



# FORCE SCIENCE<sup>®</sup> NEWS

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## Expert: ARDs rare but demand high-priority attention

### I. Expert: ARDs rare but demand high-priority attention

In a snapshot preview of a book he'll publish this summer, prominent researcher Dr. Darrell Ross recently offered law enforcement trainers a provocative update on one of the rarest events in policing, yet one of the most vexing: arrest-related death.

In a presentation running nearly four hours at the annual training conference of the International Law Enforcement Educators & Trainers Assn., Ross explored new findings from an analysis of nearly 5,000 ARDs in the US that he conducted—likely the most extensive investigation of the subject yet undertaken.

“This is serious stuff,” he said. “Like officer-involved shootings, ARDs are contentious, controversial, and highly charged. They often involve racial issues that provoke media coverage and community outrage. Medical examiners and the courts often fail to understand them correctly. And officers in some cases are being unfairly criminally prosecuted and sentenced to unusually long terms in connection with them.”

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At ILEETA, Ross, a CJ professor and director of the Center of Applied Social Sciences at Valdosta State U. in Georgia, focused predominately on the relationship between ARDs and conducted electrical weapons. That subject and more are elaborated on in his forthcoming book, *Guidelines for Investigating Officer-Involved Shootings, Arrest-Related Deaths, and Deaths in Custody*, coauthored with Dr. Gary Vilke. The book is expected in July or August.

Highlights from Ross's ILEETA appearance include:

**"HIGH PRIORITY" RARITIES.** Statistically, ARDs occur "very, very infrequently," Ross said, "but the liability, implications, and political fallout from them are extremely high, so they command a high priority."

Excluding officer-involved shootings, pursuit accidents, and suicides, he tabulated that 4,813 people died during a six-year study period while struggling during an arrest, while under restraint, during transport, while in custody, or at a hospital. That's roughly 800 a year on average, and the trend is not increasing, Ross said.

Given that some 13,000,000 arrests occur in this country in an average year, control- and restraint-related fatalities result in only about 0.00006%, Ross calculates. In contrast, medical errors annually cause more than 250,000 deaths among the general US population. OISs result in about 900 deaths in a typical year.

About 75% of ARDs occur on the street, 25% in jails, and 5% in medical facilities. Two-thirds involve misdemeanor calls, predominately disorderly conduct/suspicious behavior, disturbances,

domestic violence, and traffic stops/altercations.

Most decedents are males in the 20-45 age range, under the influence of intoxicants, mental illness, or both, Ross found. Typically, three to six officers are involved in the incident, and multiple uses of less-lethal force, including empty-hand control techniques, OC, and CEWs, have been employed. Commonly, the subject has become "tranquil" after having been "agitated" and "combative," then "suddenly and unexpectedly" he is "unresponsive"—and dead.

**REVIEW PROBLEMS.** "For most officers, an ARD is a once-in-a-career event," Ross said. "And the same is true for most medical examiners whose job it is to establish the cause of death."

These fatalities can be medically mysterious, with a specific cause not readily apparent or easily determined at autopsy. "Classifying the manner of death can be problematic and requires caution," Ross said. But with "little pathological evidence" to go on, he claimed, a time-pressured medical examiner may speculate without a solid medical foundation that arrest-related tools, such as a CEW or physical control/restraint techniques, were a causal or "contributing" factor.

In such cases, "temporal is conflated to causal," Ross said. But because something like the use of a CEW occurred at about the same time as an ARD "does not necessarily make it a direct, causal link to the death," he explained. Yet a medical examiner may draw that link "without explaining the exact mechanism" of causation or citing any "reliable, supportive scientific research."

“Well-designed, peer-reviewed, controlled studies have discredited alleged causal diagnoses,” Ross declared, “yet they still appear on death certificates and autopsy reports.”

Likewise, courts in reviewing ARDs in civil or criminal cases often “misunderstand, misapply, or ignore” current scientific research, Ross charged, putting officers whose actions are at issue at a significant disadvantage.

SCIENTIFIC REALITY. Ross zeroed in on the speculative allegation that CEWs can be decisive factors in ARDs.

“Without question, the Taser is the most researched piece of equipment on a police officer’s belt,” he stated. More than 750 academic studies of CEWs have been published and in the process many alarming and persistent myths have, in fact, been scientifically refuted.

Well over 3,000,000 field applications and more than 2,000,000 training and other voluntary exposures, plus a bevy of research experiments, have clearly established these CEW realities, among others, according to Ross:

- CEW use presents “no substantial increased risk of cardiac dysrhythmia or ventricular fibrillation or induced cardiac arrhythmia”;
- “Studies have not found a physiological basis for respiratory compromise”; indeed, subjects tend to “breathe faster and deeper” when Tased;
- There is a “theoretical possibility” of electrocution, but a dart would have to

penetrate to within 4mm of the heart, a near impossibility given the organ’s protective shield of flesh and bone;

- There may be a slight metabolic change, “but significantly less than that caused by fighting with an arrestee”;
- Researchers have “not found a clinically important effect from CEWs on the body’s electrolytes”;
- “Induced pain is not a valid contributing mechanism” to death;
- There is “no published data supporting” the risk of a CEW triggering a seizure or loss of consciousness;
- “There are no clinically significant biochemical or physiological changes from [continuous] CEW discharges up to 45 seconds”;
- “Multiple applications do not pose a substantial risk of death”; electricity does not build up in the body like poison.

Bottom line: “Research shows that the CEW is the safest force option available to law enforcement, with a lower risk of injury than other force measures,” Ross declared. There are only two known ways in which CEWs can contribute to ARDs: by causing uncontrolled falls that induce fatal traumatic brain injury and by igniting flammable fumes that then kill the arrestee.

“The majority of ARDs do not involve CEW use,” Ross found. But when plaintiffs or prosecutors attempt to blame these devices for a subject’s death, “you need an attorney who thoroughly understands use of force,

the equipment involved, and the science of human performance,” he said.

COURTS SPEAK. Ross, who has testified as an expert witness in some 300 law enforcement cases, has looked extensively into how the courts have treated ARDs. He analyzed 1,250 state and federal cases that were decided or settled between 1991 and 2016, and identified some useful trends.

Claims against officers primarily centered on allegations of excessive force, failure to follow training or manufacturers’ guidelines, false arrest (no PC), or failure to provide timely or competent medical assistance to an injured party.

Challenges of administrators tended to concentrate on allegedly unconstitutional or deficient policies that didn’t meet contemporary police standards, as well as failure to train, supervise, discipline, properly hire, or meet requirements of the Americans with Disabilities Act.

Where courts have ruled that officers used unreasonable force, they’ve cited factors such as these, Ross pointed out:

- “No serious crime was at issue”;
- “The subject’s behavior or resistance was less than ‘active’”; (generally, for instance, use of a CEW is considered excessive if used on a ‘passive’ resister);
- “The decedent did not present an immediate threat”;
- Multiple officers were on the scene, so there was “no need” to use a CEW;

- Once the decedent was controlled and restrained and resistance ceased, the need for force ended.

Increasingly, Ross said, courts “like to consider the possible ‘diminished capacity’ of the decedent’s mental state” in assessing whether the level of force was proper in ARD incidents.

They’ll want to know if the suspect was “confused or disoriented, naked and unarmed, a flight risk, able to understand and comply with instructions and given time to do so,” Ross said. “Mental health and diminished capacity are definitely relevant factors these days. An agitated and emotionally disturbed person does not necessarily equal an immediate threat” in the courts’ view.

As part of his presentation, Ross analyzed significant ARD cases from each of the US appellate circuits, including *Armstrong v. Village of Pinehurst*, which we covered in detail in *Force Science News #308* (4/17/16).

DEFENSIVE PRELIMINARIES. In a call to action, Ross urged trainers and administrators to begin preparing defensively for an ARD in their jurisdictions by tending to a couple of basics:

1. Check your “Response to Resistance” policy. Do officers understand it? Are they competent on it? Does it help them make decisions under stress in the field?
2. Review your annual UOF training. Does it include policy testing and an update on legal issues? Is it scenario-based and competency-based on all duty-belt equipment, as well as restraints and empty-hand control

techniques? Is it decision-making oriented? Does it include multiple-officer responses? Does it cover CEW applications as related to diminished-capacity individuals? Does it include medical issues and responses to injured arrestees? Does it prepare officers and supervisors to respond to an ARD investigation and lawsuit?

Covering so much for such a relatively rare event may seem like a lot—until it happens, and you need it.

Dr. Ross can be reached at: [dross@valdosta.edu](mailto:dross@valdosta.edu).

[As reported in Force Science News #337 (5/3/17), Dr. Ross will be presenting at a special use-of-force conference sponsored by the Miami-Dade (FL) PD June 26-27. For more information on the program, email Lt. Alvaro Ortiz at: [aortiz@mdpd.com](mailto:aortiz@mdpd.com) or call: (305) 715-5000. You can also click here for a conference brochure.]

## **II. 4 studies highlight why your physical fitness matters**

A recent online research roundup published by the National Strength & Conditioning Assn. adds to the ever-growing evidence that physical fitness matters in practical ways to public safety personnel.

The report is included in the group's quarterly journal, Tactical Strength & Conditioning, and was compiled by Dr. Rod Pope, associate professor of physiotherapy at Bond University in Australia and an expert on military injury and preventive training.

Among studies cited by Pope are these:

**SEDENTARY TOLL.** Researchers studied 67 male and 70 female recruits at an overseas academy where sedentary learning apparently was the order of the day. Their height, weight, muscle strength, and muscular endurance were measured at entrance and again after eight months of academic work. During the interval, the recruits received no organized physical training.

The unsurprising result: a "significant" increase in average BMI and marked decreases in horizontal and vertical jumping ability and hand-grip strength. The changes ranged as high as 7%.

Such deterioration "is likely to increase risks in later training" and possibly on the street too, Pope notes. The findings were "a useful reminder of the perils of filling the time of tactical personnel with academic activities and other sedentary duties that impede their engagement in regular physical training," which is "vital...for their occupational role."

**MARKED IMPROVEMENTS.** On the other hand, a research group that studied 55 recruits at a university-based police academy in the US documented strong positive benefits from just modest exposure to physical workouts.

The participants were tested to establish a fitness baseline, then retested after eight weeks and 16 weeks of one-hour, three-times-a-week physical training sessions that included "aerobic training, plyometric training, bodyweight training, and resistance training exercises."

"[S]ignificant, measured improvements [were noted] in agility, upper-body and lower-body peak power, sit-ups and push-

ups” and these enhancements sustained across the 16-week period.

“However,” Pope points out, “no significant improvements in any of the fitness measures occurred between the eight-week and 16-week time points, suggesting that cadets were not physically challenged in the last eight weeks of the program.

“Valuably, these results provide a reminder that regular assessment of fitness gains is important in tactical physical training programs to...ensure that training goals are being achieved and identify opportunities to enhance the training outcomes by program modification, where needed.”

**FITNESS & INJURY.** A study of fitness level and likelihood of injury in firefighters may be relevant to the police world as well.

Some 800 career fire service employees were tested for cardiovascular health, muscular strength, endurance, flexibility, and body composition and then grouped as having high, medium, or low levels of fitness.

Firefighters in the low-level category “were nearly twice as likely to report an injury” within the five-year study period as those in the high-fit level, Pope reports. “When sprains and strains were examined separately, the difference in injury rates

between ‘less fit’ and ‘high fit’ categories...increased nearly threefold.”

**FITNESS & AGING.** Finally, about 500 US wildland firefighters were surveyed regarding years of service and the likelihood of being “diagnosed with a range of health conditions or requiring orthopedic surgery.”

Results: The odds of subjects having high blood pressure were more than four times greater in those with 10-20 years’ service than in those with less than 10 years, and five times greater in those with over 20 years on the job. Similar trends were noted regarding elevated cholesterol levels, heart arrhythmias, and the prevalence of wrist/hand or knee surgery.

“Regular aerobic exercise, reduction of time spent each day in sedentary activities, dietary habits that promote heart health,” and exercise that helps strengthen muscles around joints may help overcome these disparities, Pope suggests, although he admits that “these recommendations can be challenging to consistently implement” on a daily basis. Challenging, but worth the effort!

Our thanks to Dr. Robert Pettitt, professor of exercise science & physiology at Minnesota State U.-Mankato, for alerting us to Dr. Pope’s compilation.

Written by Force Science Institute  
2017

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