Once again, scientific probe challenges alleged danger of prone positioning and hog-tying

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I. Once again, scientific probe challenges alleged danger of prone positioning and hog-tying

The tactic of proning out and "hog-tying" a combative suspect has taken repeated bad raps over the years as a potential cause of arrest-related death. Yet rigorous scientific studies have failed to substantiate the technique's alleged danger.

Now add the findings of yet another research group to the controversy--findings that again seem to support prone positioning as a viable option for controlling combative subjects.

Headed by Dr. Davut Savaser, an emergency medicine specialist, a team of eight physicians and one PhD from the University of California-San Diego School of Medicine investigated the claim that prone positioning and the force required to place a suspect in that posture can "adversely impact cardiovascular function" to the point that "restrained individuals may be at significant risk" of dying.

The team's test subjects were 25 male volunteers from the UCSD campus who ranged in age from 22 to 42. In random order, each underwent five separate trials in different body positions while their heart and circulatory functions were closely monitored. Specifically they were studied while supine (face up), prone (face down), prone with "maximal
restraint" (hog-tied), prone maximal with 50 lbs. of weight on their back, and with 100 lbs. of weight.

In the maximal positions, the subjects were handcuffed behind their back, with "ankles secured together within one to two feet of the wrists via restraint straps." Plate weights laid in the center of their back were intended "to simulate the force often required to place individuals" in those positions.

The volunteers stayed in each posture for three minutes before any cardiovascular measurements were taken "to allow for physiological adjustment." Each subject had at least five minutes' rest between positions.

Multiple readings, including heart rate, oxygen saturation, blood pressure, and blood flow, were taken and analyzed and sonographic images were made for cardiographic evaluation.

At 100 lbs. of weight, subjects experienced a statistically significant increase in heart rate compared to other positions, but the rate still "remained within the normal range," the researchers found.

Overall, they write, "We found no or minimal changes in vital signs...in all the prone positions [and] we found no differences in [cardiac output] between any of the positions with and without weight force."

Without change in cardiac output and no evidence of compromise of vital signs, the team found no data to support the accusation that prone positioning can produce "sudden cardiovascular collapse."

Earlier studies have tended to rule out so-called "positional asphyxia," a dire compromise of the respiratory system, as a cause of arrest-related deaths among proned-out subjects. With the latest findings relative to alleged cardio threats, "the exact cause of death in many of these cases remains unclear," the researchers conclude.

Savaser's team admits to limitations in their work. For example, "We did not replicate all potential conditions in the field, including physical exertion, psychological stress, drug intoxication, and trauma, which might impact cardiovascular function." Also greater weight on a suspect's back reflecting the force to control a struggling individual in the field might also alter results.

Because there remains much about arrest-related deaths that is unknown, officers are still cautioned to take a conservative approach where prone positioning is concerned. Attorney Mildred (Missy) O'Linn of the Los Angeles law firm Manning & Kass, Ellrod, Ramirez, Trester, a former LEO who specializes in defending officers and agencies, told Force Science News:
"I continue to advise officers to avoid dog-piling prone suspects if possible without jeopardizing the safety of themselves or other innocent parties. If during an incident there is need for a swarming type of control, try to shorten the time frame and lighten the load on the subject as much as tactically advisable. Get the subject into a seated position, monitor him or her closely, and involve EMS personnel as early as possible.

"It's important to go the extra mile with precautions because when legal challenges arise later, you want to be able to show that you tried to act in a reasonable and humane fashion."

(Previously, we have referenced a multi-officer, ground-control technique for minimizing risk in restraining the head and limbs of a violent offender, as well as other recommended arrest procedures in combative circumstances. See FSN #201, "Special protocol for ExDS response is a valuable liability shield," 4/9/12. Be reminded that arrest-related deaths are extremely rare. The average LEO will not be involved in one in his career.)

A full report on the Savaser study appears in the Journal of Forensic and Legal Medicine, under the title "The Effect of the Prone Maximal Restraint Position with and without Weight Force on Cardiac Output and Other Hemodynamic Measures." To access a free abstract or to download the study for a fee, click here.

II. New study: Force & struggle don't affect sobriety test results

A new study reported recently at an international emergency medical conference concludes that a variety of control measures, including Tasing and physical restraint, will not affect a suspect's ability to accurately perform a standardized field sobriety test.

The issue arose from litigation in New York State involving a suspected drunk driver who ran from police after his vehicle was stopped. To bring him under control after a foot pursuit, the suspect was Tased for six seconds. Thirty minutes later, he flunked a standardized field sobriety test [SFST].

In court, his defense attorney argued that the chase and the exposure to a conducted electrical weapon [CEW] "interfered with his neurocognitive abilities," causing him to flub the test.

A team of researchers from Minnesota and California, led by Dr. Jeffrey D. Ho, decided to explore that possibility. Ho, an associate professor of emergency medicine at the University of Minnesota Medical School, is the medical director for TASER International, Inc., is credentialed as a deputy sheriff in Meeker County (MN), and is widely recognized as a leading authority on less-lethal weaponry and human physiology.
From a law enforcement training course, the researchers selected 57 volunteers, about 90% of them male and ranging in age from 19 to 55. None had used alcohol or illicit drugs within eight hours of the testing and were not sleep deprived.

All were initially given a baseline SFST that included horizontal gaze nystagmus evaluation, walk-and-turn exercises, and a one-legged stand. Three of the volunteers received one-point deductions for stepping off the line during the walk-and-turn components.

Then each participant was randomly subjected to one of five "force or resistance scenarios." They either: struggled "vigorously" against a padded instructor "by any means possible" for 45 seconds; sprinted 100 yards on a course that included a slalom and a crawl; were exposed to 10% OC spray to the face and neck; hid from a police K9, experienced a bite when found, and resisted the dog for 15 seconds; or received a TASER X26 broad-spread probe deployment to the back for five seconds.

After a 15 minute "recovery" period, the subjects were given the SFST again. "There was no worsening of SFST performance in any of the groups," the researchers found. Technically, a slight improvement was noted: "No subjects received point deductions" during the post-stressor testing, in contrast to the three deductions made during the baseline run-through.

Conclusion: Physical resistance and use of force, including exposure to a CEW broad-spread probe deployment to major muscle groups, "do not appear to impair a person's neurocognitive ability as evaluated by SFSTs," the team reports.

The study was described in full last month in a presentation at the annual Mediterranean Emergency Medicine Congress in Marseille, France.

III. Study yields jury-friendly measure of stress caused by CEW deployment

Another recent study led by Dr. Jeffrey Ho may be useful to police attorneys in getting civilian jurors to understand the true level of physiological stress inflicted on a subject by CEW broad-spread probe deployment. The stress impact of Tasing often becomes the alleged culprit in arrest-related death litigation and can easily be exaggerated in the uninformed or bias-fueled imagination.

With six fellow researchers from the US and Ireland, Ho set out to establish a realistic, layman-friendly measuring stick for bodily stress induced by TASER broad-spread probe deployment.

In the first study of its kind, Ho's team randomly assigned 37 volunteers recruited at a police and fire training facility in Arizona to various stressful activities. Volunteer groups either sprinted for distances ranging from 20 to 100 yards on a paved track or they
underwent a standard five-second, broad-spread exposure to a TASER X26 [see clarifying note below].

Through blood draws before and after, various stress markers, including levels of acidosis and catecholamines (adrenal hormones), were calculated. "The objective," Ho explains, "was to determine an 'exertional equivalence' " between a sprint distance and the TASER exposure.

The key finding: In terms of generating physiological stress indicators, a five-second Tasing from broad-spread deployment to major muscle groups is equal to no more than a 20-yard sprint. That's less than a quarter of a short block in New York City and less than the distance between bases on a baseball diamond.

This offers "a comparison to help lay persons (i.e., juries) understand the effects [of Taser deployment] in relation to something they can relate to," the researchers write. "This is very important when [an officer's] freedom could be at jeopardy when a jury does not have an understanding of the physiologic effects of [CEWs]."

If anything, the researchers note, the stress caused by physical exertion compared to Tasing may be underestimated by the study, since the test subjects were "not under the influence of drugs or alcohol and were not in the throes of a mental health crisis," as are many suspects at risk of arrest-related death.

The researchers point out that when such deaths occur, a "significant struggle" between officer(s) and the suspect is typically involved. As numerous studies have documented, physical exertion is a "significant contributor" to elevated physiological stress levels. So the question becomes how best to "minimize the factors that worsen" the risks of overexertion.

The answer appears to be to get a struggling suspect safely immobilized and then sedated as quickly as possible. And the best tool for rapid control, the researchers suggest, is likely to be "the appropriate use" of a CEW with sufficient probe spread, because of its relatively lesser generation of bodily stressors.

Note: The TASER manufacturer adds that this study involved a master instructor who shot subjects in the back from 10 feet with the X26, using standard 25-foot cartridges and 13mm darts, creating a spread of about 18 inches and encompassing major muscles. Narrower probe spreads, deployments to areas with less muscle mass, or drive stuns that basically cause only discomfort and not neuromuscular incapacitation are likely to produce "foreseeable lesser effects."

A report on the Ho study appears in the journal Forensic Science International, under the title "Markers of acidosis and stress in a sprint versus a conducted electrical weapon." To read a free abstract or to access the full report for a fee, click here.
Our thanks to attorney Michael Brave for alerting us to the studies reported in this transmission of Force Science News. Brave is member/manager of LAAW International, LLC, and national/international litigation counsel to TASER International, Inc.