Prominent researcher on in-custody deaths reacts to the Braidwood report

The first issue is with the very concept of an undertaking such as the Braidwood Inquiry on Conducted Energy Weapons. I find it exasperating that so much attention is focused on a single weapon in an attempt to find a simple, single-source solution to the complicated medical issue that is sudden in-custody death.

I think that the lives of the people who die in police custody *without* the use of CEW are just as important as the lives of the ones who died after CEW was used, yet the big picture continues to be lost in an attempt to find the simple, single solution. Disregarding the deaths of those who have not undergone CEW deployment as part of the interaction with police is something that I find not only disrespectful, it is bad science. Embracing bad science will always lead to the wrong conclusion.

There has been so much funding spent on innumerable inquiries and panels and government-level investigations into CEW and its "appropriate use" in an attempt to come to a quick answer about CEW and only CEW. Those panels, through their processes and other limitations, cannot possibly come to a scientifically robust answer to either the role of CEW in sudden in-custody death or, more important, the real question: What causes in-custody death and are there risk factors that can be identified to mitigate it? Everyone is so busy thinking that they are investigating the Taser® that they forget about everything else.

To be more specific, the Braidwood Inquiry Phase 1 was clearly only tasked with investigating the potential role of CEW and as such is by necessity extremely biased in its focus. If you only consider CEW, you will only learn about CEW. In emergency medicine, we teach residents and students who are learning about severe trauma not to become so distracted by an overwhelming injury like an amputation that they forget about the basic ABCs (airway, breathing, circulation) and subsequently fail the patient. I think that is a good principle to work under when investigating sudden in-custody death—not to be distracted by the noise that is interest in CEW, but to quietly and methodically investigate *all* the issues.

In appropriate epidemiologic study, we investigate sudden in-custody death with a regard for all of the risk factors. It is important neither to include nor exclude a potential causal factor until its role as either a factor, a confounder, or an effect modifier can be fully understood within the bigger context, since initial suppositions are often incorrect. Interest in a single force modality has been reproduced historically long before CEW technology was around. In the '80s multiple-officer restraint was blamed; in the '90s pepper spray was thought to be the clear villain; and now in the 2000s we are focused on CEW.

Holding an opinion that there is a bigger picture makes me unpopular and the subject of personal attacks on various blog sites and the like as I am accused of being pro-Taser, or that I have a hidden secret relationship with Taser International. Just to be clear, I am not and I do not.

In the Braidwood Inquiry Phase I Report there are some theories put forth that are worthy of further clarification, in my opinion. Obviously, I am very mindful of the difficulties that Judge

Braidwood faced when trying to understand, interpret, and categorize testimony from a wide variety of impassioned witnesses and then make recommendations based on the testimony presented to him. It is very difficult to get concepts succinctly into a readable document without losing the concepts.

There is discussion in the report that focuses on the fear and pain associated with CEW deployment. This discussion suggests that the specific deployment of a CEW induces an adrenaline surge of sorts that may tumble the patient into such an adrenergic overload that cardiac arrest ensues. The discussion indicates that this adrenergic overload is specific to the pain and shock of being shocked, if you will.

There is no question that the physiology of a pain-mediated adrenergic stimulation as described is correct. If the argument is that this is a cumulative issue, then some would state that it is the final reason why individuals who are in a state of extreme agitation, incoherence, and near constant physical activity and struggling are the ones to succumb when a CEW is used.

I find it rather convenient that proponents of this theory do not consider it valid that the same hyperadrenergic states are also seen in individuals who demonstrate hours of incessant physical activity, delirious mental states, acute psychotic states, and intense struggles with police officers without the use of CEW and that perhaps it is that state—and not the use of any specific restraint modality, CEW or otherwise—that leads to subject death.

However, to accept this notion would require the recognition that the weapon modality is likely a confounder and not an isolated causal agent. There would have to be acknowledgement that the CEW may not represent the simple cause that we all hope to find and eliminate.

There is also a long discussion in the report by cardiologists about the role of stress and electricity in generating myocardial infarction ("heart attack") and that the risk of myocardial infarction following such stress is higher in patients with underlying cardiac disease or hypertension.

Agreed. However, this entire discussion point surrounding one way in which CEW might be injurious is proved irrelevant when you understand that autopsy on the individuals who die following CEW application or sudden death in custody where CEW is not used does NOT usually demonstrate myocardial infarction.

It is important to note that even very early myocardial infarction is evident on even very early autopsy; it is not a "silent" issue that pathologists are missing. Simply put, myocardial infarction is not found with frequency in these individuals, so discussions of adrenergic tone and stress on the development of myocardial infarction should have no large bearing on the discussion of in-custody death on the whole or in reference to CEW and its risks since it is not what is found.

We must clarify that myocardial infarction is not the same thing as arrhythmia, regardless of the lay press' incessant tendency to equate the two.

I agree with the cardiologists who state that when there is no cause of death found, then we must think hard about arrhythmia as the cause of death. However, we have no evidence that that problem rhythm is ventricular fibrillation (VF) in humans ,either following CEW application or in cases where individuals have died in custody without CEW application.

I agree with the cardiologists who say that resuscitation from VF could be harder in very diseased hearts (if that is meant to explain why we don't do well in resuscitating subjects who suddenly die in custody). BUT, individuals who die in police custody by and large do not have the profoundly diseased hearts that would make for the difficult resuscitation that the cardiologists were talking about. In fact, there is usually no anatomic correlate to death on autopsy—which means they are not found to have very sick and diseased hearts.

Thus, the argument that these people are clearly in difficult-to-resuscitate VF because of their sick and diseased hearts does not make sense, given the autopsy findings. Yes, some have cardiomyopathy and some do have coronary artery disease but pathologists are not still not finding myocardial infarctions during autopsies. By the way, Strote's paper which discusses the incidence of cardiac disease and is quoted by some as evidence that CEW is more dangerous in cardiac disease has methodological issues that mean it should not be used as such a reference.

Further suspicions that VF may very well not be the rhythm is raised when an AED (automated external defibrillator) is at the scene. When (the few times that have been published) AEDs have been applied, no shock has been advised, which means the rhythm is not VF. There are reasons (delay in application, etc.) that VF might not be there at the time the AED is applied, but it is also possible that VF is not the rhythm from the start.

A letter to the editor by Kim et al. to the *New England Journal of Medicine* that discusses a case where VF was documented is discussed in the Braidwood testimony, but one wonders why such a case was not presented as a case report rather than as a letter to the editor for such a significant issue. There are very many details missing and there are more questions than answers in the reading of that letter. A single letter to the editor with much missing detail is not evidence that VF is the widespread problem.

On the upside, Judge Braidwood's recommendation for AEDs in the back of all police cars will help us to sort out what the rhythm is in all people who suddenly collapse and die during or after the process of restraint, if AEDs can be applied very quickly at the scene. AEDs will not improve outcome if the rhythm is not VF. However, use of AEDs at the scene will be a major improvement in our ability to understand the underlying physiology of sudden in-custody death and why the people who suffer it are nearly impossible to resuscitate.

I think that having AEDs in the back of police cars is a good thing for the public in general, especially if officers are actually trained and recertified regularly in their use and also get some regular training in basic first aid. How such an expensive program would be funded and how certifications and training would be maintained without a serious cutback in other police activities is beyond me. Maybe the provincial, federal, and state governments will agree that this is an issue worthy of additional funding since the recommendation comes from their inquiry.

If we don't know what the rhythm is when people die in custody, many would argue that we shouldn't continue to use the CEW. What is the downside to restricting use? Public and officer safety springs to mind, medically.

I am not a police use-of-force expert or a policy maker. As a member of the public, I agree with the fact that there have definitely been misuses of CEW and those are inappropriate and should be stopped. It should be duly noted however, that uses of CEW for people with minor infractions have not caused death and limiting their use in those areas is one of ethics and appropriate police practice and not prevention of death. While many would suggest that use of such a weapon must be limited because it "could possibly" cause death, this has not been the experience in hundreds of thousands of CEW applications in North America. People who have died do not fit a minor infraction profile, really they don't.

I disagree with the stance that reliance on other use-of-force options instead of CEWs is going to limit injury and death. Virtually no one (other than a study I am currently involved in) seems to keep track of either the individuals who die without CEW use or the individuals who undergo CEW application and do not die. There is not much published about who gets severely injured by other modalities than CEW.

It is easy to say "don't use CEW, we don't know enough about it" if you disregard the literature surrounding outcomes in the field like that of Bozeman et al. who demonstrated that the significant risk profile was well under 1% .

There is argument that we should turn to something "we know" and are not afraid of. Simply put, no one has really well documented the risk profile of other modalities in a clear and comprehensive way, so what we think "we know" we are actually just more familiar with and since it is not electrically powered we are less afraid. However, if you look at limited data surrounding injuries or review the data from agencies before and after CEW inception, you might have a different idea.

All such data however, is conveniently disregarded as being "pro-Taser®". The whole pro-Taser® rationale for disregarding such findings is tiresome. I am not defending CEW, I don't actually care if CEW is preserved or not; it makes no difference to me. But, I am interested in the science of the whole issue and in the protection of people from injury and death, and I don't think we can responsibly say that physical control, baton, K9 use, projectile rounds, or firearms are less injurious to anyone. Pepper spray probably has a pretty good injury profile but is hamstrung by ineffectiveness on many subjects for various reasons.

The question is, what level of risk are we comfortable with, leaving emotion and fear out of it? Is electricity more dangerous because the general public is afraid of it, even if we know its risk profile with very precise estimates of risk? Can we really disregard deaths that happen without CEW and be proud of ourselves that we have made the public safer by getting rid of a specific modality?

In my opinion, we cannot at this time claim to make the public safer because we have proved that CEW is more harmful than the alternatives. If you don't like it, get rid of it, but don't do so

by claiming scientific proof that you do not have. Be prepared to examine the consequence of what you thought you were doing.

If CEW use is limited, I think that subjects and cops will continue to be injured and some of both will die in the process of interacting with each other, particularly when those interactions are violent and uncontrolled in the physical sense. The limitations placed on CEW in the Braidwood report will not decrease use in the subject group that is dying, since the subjects who have died are usually described as violent, assaultive, or self destructive and incoherent and thus do not cooperate with commands—exactly the profile of subjects who die *without* CEW use.

We need to keep appropriate track of what happens to understand it scientifically in order to make responsible decisions and we should not focus on only one modality because we want it to be the problem and thus the easy solution that we all crave.

It would go a long way to our understanding of this issue in detail if there was measurable interest in the actual answer to the question of in-custody death by demonstrated appropriate effort and funds directed specifically toward its study. Many committees/inquiries/government - level reviews have paid lip service to the notion that "research should be carried out," while few have ponied up the funds or committed seriously in any way to research surrounding subjects of police interest.

Similarly, it would be pretty terrific—not to mention scientifically sound—if research that takes a step back to look at all features of in-custody death or investigates the physiology that may be part of the syndrome were not immediately discarded as "trying to get Taser off the hook." Many of us work in complete isolation from Taser International and its interests, yet when our research doesn't point the finger at them, we are accused of being secretly in cahoots. I really don't care on a personal level; the only reason it matters is if correct results—that could save lives or prevent injury—are discarded.

The objective of our research is to find out what factors lead to sudden in-custody death, and if CEW is found to be part of the equation, we will be happy to say so. There is not a compelling body of evidence that considers all features that says so at the moment and so we continue.

There is not much in medicine that we understand so poorly as in-custody death, nor is there much in medicine that is so difficult to research appropriately. But, the truth lies in the data and there is safety in the truth.

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