

**Tom S. Neuman, M.D., FACP, FACPM, FUHM
Del Mar, California 92014**

November 5, 2021

Ms. Tricia Hanson
Racine County District Attorney
730 Wisconsin Avenue
Racine, WI 53403

Dear Ms. Hanson,

Per your request, I am sending you this letter to provide you my opinions related to the death of Mr. Malcolm James. Please understand, opinions are always based upon the facts at hand and should additional data become available, such information might affect my opinions, and as a result I must reserve the right to amend them.

To start, I must explain I am critical of Dr. Lelinski's conclusion concerning Mr. James' cause of death (COD). Dr. Lelinski concludes Mr. James died of asphyxia, however in this case, from an anatomic point of view, there are no physical findings which would lead to that conclusion (nor would any such findings be expected had Mr. James actually died of asphyxia) but there were no other physical findings she considered important enough to have caused Mr. James' death. However, although she notes Mr. James had cardiomegaly (510 gram heart) and microscopic evidence of interstitial fibrosis, she does not appear to consider these as significant enough to be the cause of Mr. James' death. By discounting these cardiac findings one must conclude her diagnosis of the COD is based upon her understanding of respiratory physiology and the sequence of events as seen on the video documenting what occurred.

My first opinion then, is Mr. James had a very unhealthy heart. Although some pathologists believe a heart weight up to 500 grams is normal, this is often based upon a poorly done study from the Mayo Clinic, which had a severe sampling bias when it was performed. More recent autopsy work suggests a reference weight of the normal heart to be between 233 and 383 grams (Molina and DiMaio), however this study too suffers from sampling bias. But work done in Framingham suggests the normal heart weight is even lower still. This is important, as an increase in left ventricular heart weight of as little as 50 gms/m incurs an increased risk of sudden death by at least three fold. In this case however, Mr. James' heart weight was at least approximately 127 grams heavier than it should have been, markedly increasing his risk of a sudden cardiac death. Additionally, the finding of interstitial fibrosis is also a risk factor for sudden cardiac death. Therefore it is clear the cardiac findings at autopsy must be considered as a potential cause of death.

The next question to be addressed is whether or not, from a physiologic point of view and from the experimental data that are available, could Mr. James have asphyxiated as Dr. Lelinski has opined. Given what appears to be the sequence of events in this case, asphyxiation is essentially impossible. One must understand asphyxiation is a process that in general, requires approximately 5 minutes of no breathing whatsoever for a

cardiac arrest to occur. In this case Mr. James was bent over forward in a hip flexed head down (HFHD), position (to remove Taser prongs), for a period of approximately three minutes. This is a time period simply insufficient to cause a cardiac arrest from respiratory insufficiency even were he unable to breathe at all in this position. Thus from a temporal perspective this could not be an asphyxial death. There is however no question that a HFHD position did affect his ability to ventilate (breathe). The important issue however is, quantitatively how much does this position adversely affect the maximum ability for an individual to breathe? The measurement of the maximal ability to breathe is called the maximum voluntary ventilation (MVV). In a recent study (Childers), in healthy seated subjects with heavy prior exertion, and five minutes in a in a HFHD position, only a small decrease in MVV compared to baseline MVV levels was observed. However, even with this decrease, mean MVV levels were still 96% of predicted after five minutes in the HFHD position. Though this is a measurable decrease, there was no evidence to suggest this positioning would lead to asphyxia over a five-minute time period.

It is important to appreciate the oxygen requirement of an individual is almost totally dependent upon the amount of muscular contraction taking place. For example, an athlete running up the stairs of a stadium requires more oxygen and more ventilation than the individual sitting quietly in front of a television set. The quantification of the amount of oxygen an individual is using is called the VO_2 (oxygen consumption) and this has been experimentally determined in healthy young maximally restrained subjects (Michaeliwicz) who would be able to generate a higher VO_2 than Mr. James. The oxygen consumption dictates the amount an individual must ventilate to provide that much oxygen to the body. The notion that minimal loads upon ventilation will cause hypoxemia (low blood oxygen) and/or asphyxiation in circumstances such as these is based upon basic misunderstandings of ventilatory physiology. One can easily calculate the oxygen requirement for a person in Mr. James' circumstances based upon published data and thus assess his ventilatory needs in this setting. Given any reasonable estimate of Mr. James' oxygen consumption during this incident, his ventilatory ability was more than sufficient to meet this need. I cannot emphasize strongly enough that without the ability to *quantitatively* assess the effects of ventilatory loading and the oxygen requirements in any given situation, any comments about asphyxia, difficulty breathing, or restricted breathing must be viewed as *ipse dixit*.

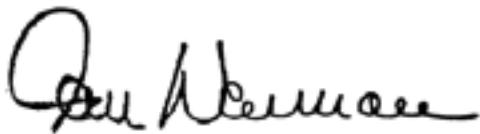
I am fully aware that much of the work to which I have referred above has been criticized. It has however not been criticized because of methodology, statistics, or scientific merit but rather criticism has been made to question the extrapability of these results to the field setting, since the laboratory setting does not duplicate all field conditions. The criticisms leveled have been that the test subjects in these experiments were not psychotic, on drugs, nor frightened by the circumstances of the testing. These critiques are valid up to a point; however there is no reason to believe a psychotic individual has inherently different ventilatory capabilities than someone who is not psychotic. The same is true for the effects of stimulant drugs or the effect of fear. To the best of my knowledge none of these experiments were performed at 10:30 PM and none of the test subjects were named James. Does that then invalidate these results because of the time of day the tests were performed or the name of the test subjects? The same is true for the criticisms concerning the mental status, drug state, and emotional status of the test subjects. There is simply no physiologic rationale to support the notion that such

affected individuals have inherently reduced ventilatory capabilities and therefore these concerns are inappropriate.

The final question of this case to be addressed is whether, had there been a more timely and appropriate medical response to Mr. James' cardiac arrest, is more likely than not he would have had a neurologically meaningful outcome. Given the initial electrocardiographic rhythm documented by the paramedics, multiple studies have indicated the chance of neurologically intact survival with his rhythm (asystole) is essentially nil. Therefore, despite the delays in the initiation of appropriate care and the arrival of the paramedics, it is exceedingly unlikely Mr. James could have had a meaningful recovery.

In summary then, given the lack of experimental evidence, the lack of a physiologic rationale, and the rapidity in which Mr. James' cardiac arrest occurred it is unlikely that he suffered an asphyxial death. Given the presence of an enlarged heart with microscopic evidence of interstitial fibrosis and the ramifications such findings represent, it is far more likely Mr. James' death was a "sudden cardiac death" and his cardiac arrest was not due to inadequate ventilation.

Very truly yours,

A handwritten signature in black ink, appearing to read "Tom Neuman". The signature is fluid and cursive, with a large initial "T" and "N".

Tom S. Neuman, MD, FACP, FACPM, FUHM
Emeritus, Professor of Medicine
University of California, San Diego