*HAROLD WAYNE NICHOLS VS. STATE OF TENNESSEE*

# DECLARATION OF DAVID M. ARONOFF, M.D.

STATE OF TENNESSEE

COUNTY OF DAVIDSON

I, David M. Aronoff, M.D., do hereby declare under penalty of perjury the following is true to the best of my knowledge, information, and belief:

I am over the age of eighteen (18) years, am competent to make this Declaration, and have personal knowledge of the facts contained herein. My opinions expressed in this declaration are my own and do not represent those of my employer.

I reside in Davidson County, Tennessee.

1. I have devoted a significant portion of my career to the study of infectious diseases. I am currently the Director of the Division of Infectious Diseases at the Vanderbilt University Medical Center, a position which I have held for the past seven years. I am also a member of the Vanderbilt University School of Medicine faculty, where I hold the Addison B. Scoville Jr. Chair in Medicine and teach courses in immunology, microbiology, and pathology. Prior to coming to Vanderbilt, I was a faculty member in the Department of Infectious Diseases at the University of Michigan. Earlier in my medical career, I completed a clinical fellowship at Vanderbilt in infectious diseases. I have extensive research experience in lung immunology and life-threatening infections. I have been elected as a Fellow in both the Infectious Diseases Society of America and the American Academy of Microbiology. I have also published extensively and lectured at universities, conferences and seminars across the country on the subject of infectious diseases. As a result of my work and research, I have consulted with legal teams and testified as an infectious diseases expert in scores of cases throughout the years.

2. I also have extensive experience and familiarity with the particular dangers associated with COVID-19; I have been involved in the daily care and supervision of each and every hospitalized COVID-19 patient (apart from asymptomatic patients)—which currently exceeds 200 individuals—at Vanderbilt University Medical Center since March of 2020.

3. People hospitalized with COVID-19 suffer long-term complications—whether caused by the virus itself or the inflammation it triggers. The course of the disease is not quick; symptoms can linger for months and damage may be permanent. While some patients may fully recover, there are concerns that others will suffer long-term damage including lung scarring, heart damage, and neurological and mental health effects. For some patients, a full recovery might still be years off. For others, there may be no returning to normal.

4. Severe COVID-19 is driven not just by viral damage to cells, but by a reactive storm of inflammation that harms the lungs and other organs. This virus creates an incredibly aggressive immune response and as a result, we have already seen residual lung scarring in COVID-19 patients. Many patients hospitalized for COVID-19 are also experiencing unexpectedly high rates of blood clots, likely due to inflammatory responses to the infection. These can cause lung blockages, strokes, heart attacks, and other complications with serious, lasting effects. Although strokes are more typically seen in older people, strokes are now being reported even in younger COVID-19 patients.

5. Blood clots can also cut off circulation to part of the lungs, a condition known as a pulmonary embolism, which can be deadly. Following a pulmonary embolism, long-lasting symptoms and functional limitations are frequently reported by survivors. These include fatigue, heart palpitations, shortness of breath, and marked limitation of physical activity. Blood clots in other major organs can also cause serious problems. Renal failure has been a common challenge in many severe COVID-19 patients, and patients' clotted blood has been clogging dialysis machines. Some of these acute kidney injuries may be permanent, requiring ongoing dialysis. Clots outside organs can be serious, too. Deep vein thrombosis for example, occurs when a blood clot forms in a vein and COVID-19 patients have had limbs amputated after virus-related blood clots. Abnormal blood clotting seems to be occurring in individuals even after they have appeared to recover. As a result, recovered COVID-19 patients are advised to continue taking anticoagulants even after being discharged from the hospital.

6. Being critically ill, especially with low oxygen levels, puts additional stress on the heart, but it also appears that in COVID-19 patients, viral particles are specifically inflaming the heart muscle causing acute myocarditis and heart failure. As a result, some COVID-19 patients show signs of heart damage and the virus may cause lingering

cardiac damage, as well as making existing cardiovascular problems worse, further increasing the risk for heart attack and stroke.

7. The virus also affects the central nervous system, with potentially long-lasting consequences. Some hospitalized with confirmed COVID-19 have neurological symptoms, including dizziness, headaches, impaired consciousness, vision, taste/smell impairment, and nerve pain. Furthermore, it is not uncommon for patients who receive intensive treatment in hospitals to have increased rates of depression and anxiety, with some experiencing post-traumatic stress. We are still in the early days of understanding what this virus might mean for the growing number of COVID-19 survivors—what symptoms they might expect to have, how long it might take them to get back to feeling normal (if they ever will), and what other precautions they might need to be taking.

8. Given my familiarity with COVID-19's risk of spread, my experience treating those infected with the virus, and my expertise in infectious diseases, counsel for Harold Wayne Nichols have requested that I provide my professional opinion on the heightened dangers associated with conducting an execution during the current public health crisis. Mr. Nichols' execution is currently scheduled for August 4, 2020 at Riverbend Maximum Security Institution ("RMSI") in Nashville, Tennessee. These opinions, in addition to my experiences studying COVID-19 and treating those infected, draw from medical reports and articles from the World Health Organization ("WHO") and the Journal of the American Medical Association, media accounts, and recent COVID-19 outbreak data from the Tennessee Department of Health and the Tennessee Department of Correction ("TDOC"). I have also reviewed the Tennessee lethal injection and electrocution execution protocols, and the declaration of corrections expert James E. Aiken.

9. There is little question as to the devastation the COVID-19 pandemic has wreaked on our world, on our country, and on the State of Tennessee and Davidson County. The virus has quickly traversed the United States, and as of May 26, 2020, resulted in over 1.7 million cases and over 100,000 deaths. The number of COVID-19 cases in Tennessee is now nearing 21,000, nearly 5,000 of which are in Davidson County—more than that of any other county in Tennessee. Over 60 Davidson County residents have died as a result of contracting the virus, resulting in an infection fatality rate of over 1.2%, or more than one death per 100 infections. This contrasts with the infection fatality rate for New York City which has been measured at 0.5% and the infection fatality rate for seasonal flu which is 0.05%.

10. Understanding of COVID-19's transmission and impact is constantly evolving, hindering government and public health officials' ability to successfully control its spread and treat its effects. Part of the reason for its rapid spread is the virus' highly contagious nature. Recent studies show that COVID-19 can remain on inanimate surfaces for up to three days and in the air for hours. Because individuals infected with the virus are often asymptomatic (there is also a pre-symptomatic window—a period of time where an individual is infected with the virus and they may be going to show symptoms, but they have not gotten them yet), the risk of silent transmission is very real. Much is still unknown about the virus, including whether COVID-19 antibodies immunize a previously infected individual from future infection. No vaccine for COVID-19 is available at this time, treatment options are limited, and it would be a medical miracle if an effective treatment becomes available prior to August 4, 2020.

11. Stemming from the uncertainty surrounding COVID-19's transmission, impact, and our immunization to it is ambiguity as to when the virus and the devastation it causes will subside. Further complicating this question are the varying state and city-level responses to the disease. With the easing of "shelter in place" and "stay at home orders" in many areas, spread of the virus may become even more likely.

12. Following a weeks-long lockdown set in place in response to an influx of COVID-19 cases, on May 11, 2020, Nashville began the first phase of its plan to reopen the city and on May 25, 2020, Nashville officials transitioned to the second phase. While social distancing and hygienic measures like surface-cleaning and mask-wearing remain in place, these stages of the greater plan to return Nashville to normalcy entail the reopening of restaurants, retail stores, and commercial businesses, albeit at reduced capacity. Nashville Mayor John Cooper acknowledges that it is highly likely that continued outbreaks will force the city to revert to greater restrictions. This concern is supported by the observations of Professor Kelly Goldsmith, a consumer behavior expert and a member of the faculty at Vanderbilt's Owen Graduate School of Management, who is skeptical of Nashvillians' ability to maintain social distancing precautions as businesses reopen. Instead, Professor Goldsmith anticipates residents will flock to bars and other public venues as restrictions are lifted. Furthermore, the hundreds of complaints filed with the Metro Public Health Department against Nashville businesses for failing to take the proper safety precautions since the start of phase one are cause for great concern. Over the

recent Memorial Day Weekend, the Metro Public Health Department received more than 95 complaints against Nashville businesses not following COVID-19 restrictions. These violations put everyone at risk, potentially increasing the rate of transmission of the virus. The Nashville Convention & Visitors Corporation has already taken the unprecedented step of cancelling the city's annual Independence Day concert and closing the city parks to firework spectators due to the pandemic. These events are/were scheduled for July 4, just one month prior to Mr. Nichols' scheduled execution date. Nashville's phased plan followed the rest of the State's gradual reopening beginning May 1, 2020 despite a lack of evidence supporting a 14-day decrease in the number of positive tests or deaths per federally recommended guidelines. Furthermore, Dr. Alex Jahangir, Chair of the Metro Coronavirus Task Force, has cautioned, even as we move into phase two, that public gatherings should be discouraged and that Nashvillians must continue to do their part, including wearing masks, practicing social distancing, and staying home as much as they can, with everyone still encouraged to work from home, where possible.

13. With Mr. Nichols' execution scheduled to take place in just a few months, there is no certainty as to whether Nashville's efforts to contain the COVID-19 outbreak will be successful. Consideration of a host of factors at play—including a constantly changing understanding of the disease and the virus causing it, shifting social norms and behaviors, and an unreliable supply of hygienic and medical materials —makes it ill-advised to introduce the highly-volatile risks posed by conducting an execution.

14. Not only has the pandemic risen to alarming levels in Nashville, but two of Tennessee's prisons have become the site of some of the most extreme COVID-19 outbreaks in the country. As of May 22, 2020, according to TDOC data (this is the last date that TDOC data appears to have been updated), 586 inmates at the Bledsoe County Correctional Complex and 1,308 at the Trousdale Turner Correctional Center tested positive for the virus. As a result of the Trousdale prison's outbreak, Trousdale County now has the highest per capita infection rate in the United States. Alarmingly, 98% of detected cases at Trousdale were reportedly asymptomatic. 2,649 prison inmates across the State of Tennessee have been infected as of May 22, 2020, with an overall infection rate of almost 13%. For reference, the State of Tennessee overall transmission rate is about 1%. In addition, 113 TDOC employees have now tested positive. Four inmates have died, and the TDOC is awaiting autopsy results before determining whether these deaths were due to complications resulting from COVID-19.

15. Data from Tennessee jails also supports a disconcerting pattern of rapid COVID-19 spread in confined spaces. In Shelby County, 72% of inmates tested at the end of April returned positive. In late-May, a Rutherford County Jail worker tested positive for COVID-19 after the Rutherford County Sheriff's Office reported the jail had no cases. This employee was a contract kitchen worker. Rutherford County Jail now has seven confirmed cases of infected inmates. Two of the inmates who tested positive worked in the jail kitchen. The other five inmates lived in the same housing area as the infected inmates who worked in the kitchen. Both jails and prisons are designed to hold masses of detainees—a structure which runs directly counter to the recommendations by the Centers for Disease Control and Prevention ("CDC") and the response necessary to avoid a lethal outbreak.

16. Though RMSI is not amongst the State's most egregious instances of prison outbreaks, multiple inmates and staff members at the facility have tested positive for COVID-19. Even considering the current number of reported cases at RMSI, a clear warning from the smattering of significant outbreaks across the State is that once the virus causing COVID-19 is introduced into a prison environment, it spreads like wildfire. In the span of just a few weeks, the number of inmate COVID-19 cases skyrocketed from zero to thousands.

17. The structure and functioning of prisons make it virtually impossible for guards and inmates to abide by the social distancing and hygiene standards set in place by the CDC. Access to soap and alcohol-based hand sanitizer is limited in many facilities, and inmates typically share communal toilets, showers, and dining spaces. In some prisons, alcohol-based hand sanitizer is banned altogether. Hand-cuffed inmates are unable to properly cover their coughs—a hygiene-habit necessary to reduce spread. Many of the items inmates purchase from the prison's commissary may be packaged in plastic which can host the virus causing COVID-19 for up to three days. A prison's community phone, even if sanitized daily, is a hotbed for the virus. Facilities also often do not have the capacity to isolate infected or high-risk individuals, further reducing the ability to stymie the spread of the disease. With the majority of Tennessee's prisons near, at, or over capacity as of the end of February, it is difficult, if not impossible, to implement the preventive measures recommended by the CDC. As a result, just a few cases can quickly snowball into a full-on outbreak paralleling the dire circumstances already witnessed by prisons in other areas of the state.

18. Many facilities also lack resources needed to conduct the frequent and widespread testing critical to detecting cases early-on and impeding the spread of the virus. Even temperature checks have become an unmeetable standard for some prisons due to a scarcity of resources such as non-contact infrared thermometers. Moreover, considering many individuals with COVID-19 may not show symptoms for days-to-weeks, temperature checks are insufficient to identify infected individuals and the failure to detect and monitor COVID-19 cases could lead to rapid spread of the disease. Additionally, self-reporting of symptoms amongst inmates may be infrequent due to a fear of isolation or other negative repercussions.

19. Even though the TDOC reportedly ramped up its testing efforts in response to the cautionary fates of the Bledsoe, Trousdale and Shelby facilities, testing negative on the day an inmate is tested does not mean he will not be infected in the near future; a negative result merely means that prisoner did not test positive for COVID-19 at the particular time of testing. In other words, testing data provides only a snapshot of information in an ever-changing environment. After one contact, the same inmate who just tested negative for the disease can quickly become infected—an outcome which may not be reflected in the TDOC data. Reported case numbers may be inaccurate for another reason: though prisons began mass testing staff and inmates, the frequency of that testing varies. This means that, for the time between testing periods, reported numbers could be nonrepresentative of the actual number of active COVID-19 cases in a particular prison. Because the number of a prison's positive cases is difficult to know at any one time with sufficient certainty, the precise risk an execution would pose is also unknown. Even if RMSI mass tests its inmates the morning of the execution, there is no guarantee the data will still be accurate by the evening as reporters, lawyers, family members of the victim, clergy members, and many others enter the facility and expose themselves to risk.

20. The introduction of the virus causing COVID-19 in prisons can also threaten the surrounding community. In severe cases, an inmate may need to be transferred to a nearby hospital in order to receive adequate treatment. In addition to further burdening our already inundated healthcare system, such a transfer carries increased risk of spread back into the greater community. The more intermingled prisons and their surrounding community become, the greater the likelihood of continued transmission of disease in and out of both.

21. A recent report by the WHO also warns of incarcerated individuals' greater likelihood of having an underlying disease or health condition (e.g., HIV, hepatitis, diabetes, high blood pressure) than the general population, putting them at greater risk of contracting and suffering substantial harm or death from COVID-19. The percentage of inmates aged 55 and older—a group for whom the virus is more often lethal when contracted—has also steadily increased over the past two decades. As of 2016, this demographic's population in state prisons exceeded that of young adults aged 18 to 24. These factors also mean it is more likely prisoners testing positive for the virus will need to be transferred to a hospital to receive the care they require, putting the surrounding community at increased risk

22. Despite common misconception, prisons are heavily integrated with the communities that house them. Even with most facilities' cessation of visitation, many individuals come in and out of prisons on a daily basis. Once a few inmates contract COVID-19, as has already occurred at RMSI, threat of spread extends beyond prison walls and into the greater community. Considering Nashville's recent steps to reopen the city and consequently decrease its protective measures in place, spread of the disease will likely catalyze if prisons continue to interface with members of the greater community.

23. An execution requires the in-person service of scores of individuals, many of whom come from outside the prison. Persons entering the prison grounds for the execution can include, but are not limited to: spiritual advisors, the prison physician, the medical examiner's staff, members of the news media, and attorneys involved in the case. Members of the victim's immediate family may also witness the execution, and others may enter the prison in order to provide support to them. Inherent to an execution is a string of close-contact tasks, such as various staff training, media briefings, and additional security measures. After the inmate is moved to death watch, three days prior to his execution, a thorough strip search is required every time he enters or exits his cell. Needless to say, this element of the procedure requires many instances of physical contact in which COVID-19 could be transmitted. In general, prison staff maintain close and constant observation of the inmate while on death watch. On the day of execution, at least ten witnesses are ushered into a small room by an escort officer and remain there before migrating to the witness room. Witnesses may be kept in this packed holding room for over an hour. This is just one of many instances of a high volume of individuals in a confined space that occur during the course of the execution. Members of the victim's immediate family undergo a similar process of being

herded to a small space in which they may wait over an hour, then on to the viewing room. It would be extremely difficult for individuals to avoid intermittent, if not constant, contact in these cramped spaces. At the very least, they are unable to adhere to the CDC's recommendation of remaining at least six feet apart from one another. The same problems are inherent in escorting the inmate into the execution chamber, strapping him down and administering the lethal injection or electrocution. Clearly none of these required tasks allow for social distancing and in fact, require close contact. Moreover, I would expect an inmate to struggle, cough and gasp for air during the execution, and it is very clear that people can shed this virus from their respiratory track. With each of these instances comes the risk of COVID-19 transmission, and, if one thing is clear from observation of the virus, it only takes a single interaction with a single infected individual to spark a wildfire of disease engulfing entire communities in the span of days. Anyone involved in the execution or who enters RMSI in the days and weeks leading up the execution can be shedding the virus and not know it. The coronavirus is very virulent and highly infectious, easily spreading from person to person.

24. The only execution to be carried out since a National State of Emergency was declared on March 13, 2020—Walter Barton's execution by the State of Missouri on May 19, 2020—raises significant concerns for the potential safety of any execution carried out at RMSI. For one, RMSI would not be able to take some of the precautions—which still may not be enough to sufficiently diminish the high risk posed by conducting an execution—that were taken for Mr. Barton's execution. Importantly, the Missouri prison had three separate viewing rooms which reportedly allowed the prison to limit witnesses to under ten per room, spaced six feet apart per CDC recommendations. In contrast, RMSI only has two small viewing rooms, the larger of which contains a few rows of tightly-packed chairs. There is no way to both accommodate the minimum number of witnesses required for the execution and abide by CDC recommendations without deviating from protocol. Another fact differentiating the Missouri facility from RMSI is the number of COVID-19 cases reported at each. Mr. Barton's execution site had no reported infected inmates, while RMSI has had at least three inmates and five staff members test positive. Thus, the threat of rampant circulation of the virus is far more imminent at RMSI, because it has already been introduced into the prison and the institution is located in Davidson County which has had more infected cases than any other county in Tennessee. Regardless, at both facilities, an execution involves an influx of scores of individuals in and out of the prison,

introducing a high degree a risk for both inmates, staff, visitors, and the surrounding community. The CDC has already recognized the danger of such activity by recommending prisons limit the number of entrances and exits to its grounds.

25. Additional introduction of the virus by a participant in the execution may accelerate the virus's spread throughout the facility. This increases the risk of transmitting the virus to employees and others who enter the prison grounds on a daily basis and can carry the virus back into the surrounding community. Given the sheer number of individuals required to carry out an execution in Tennessee and its associated prevalence of face-to-face contact, the risk of COVID-19 spread within and outside RMSI resulting from an execution is admonitory. Not only will procession with the execution as scheduled threaten the well-being of Davidson County residents, but, because executions draw individuals from across Tennessee, it will jeopardize the entire State's efforts to diminish COVID-19 infections and resulting deaths.

26. In light of the most current COVID-19 data and knowledge of the disease, the risks posed by proceeding with Mr. Nichols' execution as scheduled are grave. The health and safety of RMSI prisoners and staff, the Nashville community, and the greater State of Tennessee are at stake and will be unduly endangered if an execution takes place amidst the COVID-19 pandemic. It is my professional opinion that, for the health and safety of the community and citizens of Tennessee, Mr. Nichols' execution scheduled for August 4, 2020 should be delayed until the imminent threats posed by COVID-19 to the State of Tennessee are mitigated.

I declare the foregoing under penalties of perjury.

Dated:__May 27, 2020_____

David M. Aronoff, M.D