

# National Association of Medical Examiners Position Paper on the Medical Examiner Release of Organs and Tissues for Transplantation

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**Abstract:** The medical examiner community plays a key role in the organ and tissue procurement process for transplantation. Since many, if not most, potential organ or tissue donors fall under medicolegal jurisdiction, the medical examiner bears responsibility to authorize or deny the procurement of organs or tissues on a case-by-case basis. This responsibility engenders a basic dichotomy for the medical examiner's decision-making process. In cases falling under his/her jurisdiction, the medical examiner must balance the medicolegal responsibility centered on the decedent with the societal responsibility to respect the wishes of the decedent and/or next of kin to help living patients. Much has been written on this complex issue in both the forensic pathology and the transplantation literature. Several studies and surveys of medical examiner practices, as well as suggested protocols for handling certain types of cases, are available for reference when concerns arise that procurement may potentially hinder medicolegal death investigation. It is the position of the National Association of Medical Examiners (NAME) that the procurement of organs and/or tissues for transplantation can be accomplished in virtually all cases, without detriment to evidence collection, postmortem examination, determination of cause and manner of death, or the conducting of criminal or civil legal proceedings. The purpose of this position paper is to review the available data, the arguments for and against medical examiner release, and to encourage the release of organs and tissues in all but the rarest of circumstances.

**Key Words:** transplant, medical examiner, forensic, autopsy, donation

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The ability to transplant organs or tissues from one person to another is one of the greatest successes of modern medicine. However, the need for donor organs and tissues vastly outweighs the supply. As of this writing, greater than 90,000 people are on the United Network for Organ Sharing (UNOS) waiting list for an organ transplant,<sup>1</sup> and approximately 17 people on that list die each day while awaiting transplantation. It is estimated that less than 15% of the population has a signed organ donor card.<sup>2</sup> The pediatric population is even more acutely affected by the shortage of organs and tissues, largely due to size constraint considerations. Approximately 30%–50% of children less than 2 years of age will die waiting for an organ transplant.<sup>3</sup>

The medical examiner is one of the most important components of organ and tissue procurement and thus the transplantation process because the majority of persons who are suitable donors fall under medical examiner jurisdiction. Indeed, it has been estimated that as many as 70% of potential donors may fall under medical examiner/coroner jurisdiction,<sup>4</sup> and thus the medical examiner/coroner must give authorization before organ or tissue procurement may proceed in these cases.

Medical examiners are charged first and foremost with the responsibility of determining and certifying the cause and manner of death. To this end, they are given the legal authority and control over the body, which generally begins when the person is pronounced dead and ends after the medical examiner has completed a medicolegal death investigation and, in many cases, an autopsy examination. During this period of time, the medical examiner must ensure that the integrity of the body is maintained such that the cause and manner of death may be determined, that appropriate evidence may be collected, and that any injuries or natural disease may be documented.

Any decision to authorize or deny removal of organs/tissues for transplantation must consider and weigh the interests of the patients whose lives/health hang in the balance, the need to fulfill the statutory mandate to provide cause and manner of death opinions, and the provision of a solid factual foundation or expert opinions. The medical examiner is the person best qualified to balance these sometimes competing interests of medicine and law and should not devolve the responsibility for deciding whether a body under medical examiner jurisdiction may be an organ/tissue donor to treating physicians, O/TPO (organ/tissue procurement organiza-

tion) personnel, transplant surgeons, law enforcement personnel, or prosecuting attorneys.

For the purposes of this discussion, the terms *deny* or *denial* refer to the blanket refusal of all organ or tissue procurement from a potential organ or tissue donor. It is recognized that not all cases are appropriate for full release of all organs and tissues. In some cases, it is appropriate for medical examiners to only allow procurement of some but not all organs or tissues (eg, allowing procurement of internal organs but not skin in cases where many patterned injuries are present). These are not considered “denials” but rather “approvals with restrictions.”

In some cases, medical examiners have denied organ or tissue procurement because of the well-intentioned but unfounded concern of compromising their ability to carry out their primary medicolegal responsibility.

Frequently, medical examiner denials for organ and/or tissue procurement involve cases of known or suspected child abuse or cases of possible sudden infant death syndrome (SIDS). Unfortunately, these 2 categories make up a substantial portion of pediatric potential donors, and thus denials for procurement in these types of cases have a great impact on the availability of pediatric organs and tissues for transplantation.

The National Association of Medical Examiners (NAME) encourages the approval of organ and/or tissue procurement in virtually all cases. With rare exception, the procurement of organs or tissues can occur without jeopardizing the medical examiner’s medicolegal responsibilities. As will be discussed further, arguments for denial in certain types of cases have no empiric or scientific evidence to support them. Indeed, many of the arguments against procurement in certain types of cases appear to be motivated not by such objective measures but rather by fear of adversely affecting a future legal proceeding or from external political pressure from a funeral director or a prosecutor. Unfortunately, denials also occur because the procurement process might pose logistical problems for the medical examiner.

This manuscript deals with the philosophical principles regarding the release of organs and tissues for transplantation. This discussion is focused on the arguments for and against the medical examiner approval of procurement of organs/tissues for donation. A logistical analysis detailing specific procedures or comprehensive protocols of how to maximize medical examiner approvals is beyond the scope of this manuscript. Many medical examiners’ offices have such protocols that outline the practical aspects of communicating and cooperating with O/TPOs and transplant teams to maximize the potential for medical examiner approval. It is recognized that there are logistical differences between considering the approval of organs and the approval of tissues for procurement. However, since this discussion is primarily philosophical, the 2 topics are discussed together rather than separately since the philosophical issues are essentially the same.

## DISCUSSION

The primary function of the medical examiner is to determine the cause and manner of death. Currently, all potential nonliving organ donors will have some period of survival in the hospital. In many of these cases, the cause of death is already reasonably known from the investigation and clinical course at the hospital, especially if the patient has undergone adequate diagnostic evaluation. Practices vary from office to office; some medical examiners certify deaths without performing an autopsy in nonhomicide cases where the cause of death is reasonably established and there are no other reasonably foreseen medicolegal issues (for example, a patient hospitalized for a drug overdose who died after being in a coma for several days), whereas others perform autopsies on all decedents with a nonnatural manner of death. In cases in which the cause of death is not reasonably established or other medicolegal issues remain unresolved, an autopsy is usually performed.

Neither organ nor tissue procurement precludes the performance of a “complete autopsy.” All components of examination may still be performed, although some may need to be performed in a different manner than usual. The first component of the autopsy is the external examination. Even though the medical examiner will be able to view the body following procurement, it is important to ensure that the medical examiner is able to view the appearance of the body before procurement. Ideally, this may be accomplished by the medical examiner performing the external examination prior to procurement; however, this might be hindered or prohibited by various logistical constraints (eg, staffing, time, travel distances). Medical examiners cannot necessarily depend on clinicians or procurement technicians to properly characterize injuries. This underscores the importance of complete photographic documentation of all body surfaces prior to procurement to ensure that the medical examiner will be able to view the external body surface in the unadulterated state. It is important to remember that organ procurement is performed via a single midline thoracoabdominal incision and sternotomy. The procurement of long bones from the extremities also involves isolated incisions. The entire skin surface remains in these cases such that an external examination should remain unhindered as long as steps are taken to preserve the integrity of defects (eg, gunshot or stab wounds) or, if the procurement incision must traverse a wound, to ensure the medical examiner is satisfied that the wound has been adequately examined and its features documented. In the case of skin tissue donation, this would not be the case, and any injuries involving a potential donor site that cannot be adequately examined or documented prior to procurement should be left intact or, if numerous, the procurement of skin from the involved area should be denied.

The second component of the autopsy is the internal examination. Findings encountered upon opening the body, such as injured organs or blood within the body cavities, must be documented by the transplant surgeon to the satisfaction of the medical examiner. Procurement personnel, including the surgeon, must agree to return, if necessary, to the applicable

jurisdiction at no expense to the taxpayers to testify as to their observations. Photographic and other imaging studies can further document the appearance of the body cavities and their contents. In some cases the medical examiner may ask the O/TPO to conduct extra tests beyond those normally contemplated for organ screening (eg, CT, angiography, full body radiography) when such tests are deemed necessary to adequately address foreseeable medicolegal issues. In general, an organ that appears unhealthy or that has sustained severe trauma will generally not be acceptable for donation and will not be removed from the body; the medical examiner will thus be able to directly examine the organ. In some instances, an organ may be sufficiently damaged to preclude successful transplantation, but its procurement may be desirable for use in research. In such cases, these organs must not be removed prior to consultation with the medical examiner and without the explicit approval of the medical examiner. With minor trauma that would not medically prohibit transplantation (eg, a small liver laceration that can be oversewn), the transplant surgeon must document his/her findings such that the medical examiner has access to this information. Although procured organs are not directly available to the medical examiner at autopsy, they can be photographed and even biopsied such that microscopic abnormalities may be detected. Directed biopsies may also be performed at the medical examiner's request. Furthermore, if the organ grafts successfully and functions properly in the transplant recipient, it is highly unlikely that it was associated with the cause of death of the donor. In fact, this "test" of donated organ function is unique to transplanted organs. Of course, the pathologist may attend the organ recovery surgery and personally view the organs if he/she feels that this is necessary.

Some medical examiners have expressed concerns regarding the fact that they would be relying on the surgeon to accurately document his/her findings and to be willing to testify to them in court. The documentation of findings is something that must be insisted upon when protocols for medical examiner cases are being formulated. The surgeon would not be interpreting or characterizing findings, only documenting them for the medical examiner to do so. Testimony by the transplant surgeon should rarely be required in person, but if so, the surgeon should fulfill any legal obligation to comply with a subpoena. However, with rare exception, there is no reason that medical examiners could not testify to the surgeon's documented observations. Medical examiners routinely testify to findings documented in hospital charts; testifying to the procurement surgeon's observations would be no different.

The discussion up to this point has addressed issues and concerns related to potential detrimental effects of organ and/or tissue procurement on the postmortem examination. Of equal importance, however, is the correlation of the postmortem examination with the scene and investigative findings. Indeed, many of the concerns about allowing procurement are ultimately focused on determining the manner of death rather than the cause. The investigation of the circumstances surrounding the death has a substantial bearing

on the medical examiner's opinion regarding the manner of death, and the procurement of organs and or tissues obviously does not interfere with this investigatory component.

The collection, preservation, and documentation of evidence are also the medical examiner's responsibility. Potential organ donors almost always have some survival interval in the hospital, which implies that they have been undressed, possibly washed, and have undergone diagnostic and therapeutic procedures. If any evidence were on the body, it would likely have been lost well before procurement took place or the body was taken to the morgue. If the investigation by law enforcement has suggested that a crime has occurred, appropriate evidence collection (eg, trace evidence, gunshot residue collection, sexual assault kits) should have already been performed at the hospital. If procurement is to take place, the hands may be bagged to protect any further trace evidence that may remain, or evidence may be collected from the surface prior to procurement. Regardless of whether procurement takes place, appropriate steps for the collection of evidence should already be in place; for example, retention of the clothing. In the case of tissue donors, the external examination and autopsy can be performed prior to procurement. In those cases where this is not possible, the clothing can be retained and the hands bagged by the procurement team.

Ensuring the ability to collect evidence, document the presence or absence and extent of disease and/or injury, and determine cause and manner of death enables the medical examiner to ensure that the procurement of organs or tissues does not interfere with adequately addressing medicolegal issues in future legal proceedings, either civil or criminal. Defendants in murder trials have, however, claimed that extubation and removal of organs for transplantation was the cause of death, rather than the proximate action that caused the brain death of the patient.<sup>5,6</sup> However, none has been successful since the guilt of the accused is based upon his/her proximate action<sup>7</sup> and the organ/tissue procurement only occurs after death has occurred, regardless of what criteria are used to establish death. Searches of the medical and legal literature<sup>8</sup> have failed to find a single documented instance of organ procurement interfering with a criminal investigation, a prosecution, a defense, or the determination of cause and manner of death at autopsy. While this could be interpreted to mean that the proper subset of cases had been appropriately denied for procurement, there are many medical examiners' offices with zero denials and without future problems with legal proceedings.

Over the last decade, medical examiner/coroner policies, practices and denials related to organ/tissue donation have been studied.<sup>4,9,11-16</sup> The medical examiner denial rates overall have generally been between 6% and 10%. The incidence of medical examiner denials has decreased during the past 2 to 3 years following NAME's endorsement of the "zero denial" concept. It is clear that cases involving suspected child abuse or the possibility of SIDS are the most common types of cases in which medical examiners categorically deny the procurement of pediatric organs or tissues.

One nationwide survey of every organ procurement organization (OPO) queried the number and nature of organ denials from 1990–1992.<sup>10</sup> The respondents of that survey represented 71% of the OPOs and 77% of the donor population in the United States. Of all potential organ donors reported, 62.1% fell under medical examiner jurisdiction; 7.2%, 9.6%, and 11.4% of cases were denied in 1990, 1991, and 1992, respectively. Although this means that approximately 90% or more of cases were approved, the number of denials in this 3-year period was 561. Since multiple organs (usually 3 or more) can be procured from a single donor, this represents the potential for well over a thousand missed opportunities for transplantation from the OPOs that responded to the survey. In 1992, 29.3% of denials were in cases of suspected child abuse and 22.8% represented a single gunshot wound of the head. Approximately half of cases of suspected SIDS were denied for organ procurement.

In the same study, however, 10 OPO areas in the country reported no medical examiner organ denials and 5 others with only 1 denial. A similarly performed follow-up study covering the years 2000–2001 generated an 83% response rate, representing 86% of the donor population, respectively.<sup>16</sup> The denial rates were 6.8% and 6.7% for 2000 and 2001, totaling 353 denied cases. Similar to the first survey, approximately one third of suspected cases of child abuse and approximately one half of suspected SIDS cases were denied. No organ denials were reported in 10 cities and in 4 states. It is possible, however, that some OPOs did not ask for approval, because of prior experience with denials from a particular medical examiner. Some OPOs may not have asked for approval in certain types of cases, given that denial may have been the expected outcome. This selection bias would therefore falsely decrease the denial rate.

A survey of 64 medical examiner offices generated a response rate representing 29% of the US population.<sup>17</sup> The denial rate in that survey was 7%, similar to that found in other studies. This survey also discovered differing practices among the various medical examiner offices. In cases of suspected SIDS, 60% of offices reported that they always denied procurement, whereas 15% stated that they always approved these cases. Similarly, 40% stated they always denied cases of suspected child abuse, whereas 15% always approve. Homicides related to child abuse have the potential for much controversy due to their inflammatory nature and scientific controversies over the etiology of abusive head trauma. However, some medical examiner's offices routinely release organs for transplantation in cases of either known or suspected child abuse.<sup>4,10,16</sup>

Certifying deaths of children and infants can be challenging; deaths in this population exclusive of known natural disease or accidental trauma are generally unexpected. SIDS is by definition a diagnosis of exclusion. A common argument against procurement in cases consistent with this diagnosis is that procurement would interfere with the performance of a complete autopsy, thus prohibiting the exclusion of other potential causes of death. As discussed previously, procurement does not prevent the performance of a complete

autopsy. One of the differential diagnoses of suspected SIDS cases is homicide; the concerns regarding denying procurement in such cases have been previously discussed.

Most cases that would potentially be certified as SIDS are pronounced dead at the scene or after transport to a hospital. These cases are therefore candidates only for tissue donation. The only tissues generally requested from non-beating-heart infant or child cases are bone and heart valves.

Human valve tissue is far superior to prosthetic valves, primarily because they have far fewer thromboembolic complications and do not run the risk of mechanical failure. A large study of pediatric medical examiner cases concluded that the only significant cardiac abnormalities in this population that would likely be overlooked if heart valves were procured were conduction system defects, which are quite rare without a clinical history consistent with such a disorder.<sup>18</sup> Furthermore, the heart may be examined in a sterile fashion prior to procurement of valve tissue.<sup>19</sup> Similarly, since the heart is examined by a pathologist contracted by the TPO after valve procurement occurs, there is no reason to deny valve procurement in adults, even if a cardiac cause of death is suspected. A similar procedure has been developed for pediatric hearts.<sup>20</sup>

Given the importance of organ and tissue donation, numerous advocacy groups and political lobbies are working for this cause. The response to the perceived lack of cooperation and the categorical denials of organ/tissue procurement by medical examiners by such interested parties has resulted in legislation forcing the medical examiner release of organs and tissues in several states. New York and Tennessee passed legislation requiring the release of organs and tissues in 1991 and 1993, respectively.<sup>21,22</sup> Laws requiring the presence of the medical examiner or coroner at the procurement procedure if denial is anticipated were passed in New Jersey, Texas, and California in 1993, 1995, and 2003, respectively.<sup>23–25</sup> If the medical examiner or coroner still insists on denying the removal of an organ for transplantation after viewing the procurement procedure, he/she must provide written documentation explaining the reasons for the denial.

We believe that the medical examiner/coroner and the transplant communities should cooperate rather than legislate and establish procedures and protocols to satisfy the needs of all parties, maintaining flexibility and causing the least disruption or inconvenience, as has been accomplished in several jurisdictions.

## CONCLUSION

Medical examiners play a key role in the transplantation process. Our primary responsibility is to speak for the dead and to ensure that medicolegal issues pertinent to their deaths are appropriately addressed. The responsibility to ensure that all necessary documentation of findings and that appropriate collection of evidence take place rests with the medical examiner. As physicians and citizens, medical examiners also have a societal responsibility to enhance the health of citizens.

The procurement of organs will certainly increase in the future. The donor population is expected to markedly increase with the advent of donation after cardiac death, especially since the majority of potential donors are not brain dead but instead could become “non-beating-heart donors.” Because of donation after cardiac death, certain legal issues regarding medical examiner jurisdiction will have to be revisited due to the very limited time frame in which action must be taken. More types of tissues may also become available in the future, and obviously each would have to be evaluated with respect to medicolegal concerns.

Denial rates of 6%–10% mean that medical examiners generally approve procurement in over 90% of cases. This is an excellent figure, but it is the remaining cases that are the concern of this manuscript. To someone waiting on a transplant list, every single donor potentially makes an enormous difference. Furthermore, the different practices at different offices with respect to categorical approvals or denials lead to the appearance of arbitrariness.

Legislation in 5 states has by definition reduced the number of medical examiner denials and, conversely, increased the number of organs and tissues for transplantation. However, it is our opinion that coercive legislation imposed by outside groups is counterproductive to effective communication between medical examiners and O/TPOs. The fact that legislation dictates the course of action may actually lessen the communication between all involved parties, which may be detrimental to the death investigation of the decedents and to the public we are trying to serve. Further, legislation imposed due to our perceived lack of cooperation with O/TPOs is likely to result in far greater problems in carrying out our medicolegal responsibilities than if medical examiners and O/TPOs work together to come to a mutually beneficial understanding of one another’s needs to generate appropriate protocols for dealing with these cases.

It is possible for medical examiners to allow procurement to occur and still fulfill their medicolegal responsibilities. That being said, it remains of critical importance that O/TPOs as well as the organ procurement surgeons provide the medical examiner with everything that is requested, every time. Each situation is different; every medical examiner’s office and their O/TPO(s) need to come to a mutual understanding of what the medical examiner requires. Some denials do occur because the medical examiner may not have gotten everything he/she needed in past cases.

Other denials by medical examiners seem to be motivated by fear. Some are hesitant because they feel that they must see everything with their own eyes, prior to any procurement. Other medical examiners have concerns about a future adverse outcome such as being “blamed” if the prosecuting attorney does not secure a conviction. There are anecdotal reports that some prosecutors have allegedly dropped cases or reduced the charges because of the fear that the organ/tissue procurement process has somehow rendered the autopsy findings diminished or destroyed. Medical examiners have the responsibility to defend what is an appropriate, defensible position: that the procurement of organs and tissue

is compatible with successfully fulfilling all of our medicolegal responsibilities. This may also involve educating attorneys about the organ/tissue procurement processes to assure them that a complete and accurate examination has been performed and that all the appropriate evidence has been collected.

Providing that appropriate protocols are followed, there is no reason that procurement of organs and tissues should not be able to occur, even in cases of suspected SIDS or child abuse. The proof of principle already exists in that release even in these types of cases is routine in many jurisdictions in the United States, with no documented adverse outcomes. The only general restrictions that appear valid are the restriction of corneas or bones in cases of suspected child abuse or the restriction of skin tissue procurement in any case if the disruption of a patterned injury could not be avoided and the injury could not be adequately documented prior to procurement. Good working relationships with the O/TPO and the transplant team are of the utmost importance to ensure that all of the necessary steps are taken to perform our medicolegal duties. Although our primary function is to investigate death, enabling transplantation is one of the few opportunities we have to directly save and improve lives.

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