

## *Determination of Death in Execution by Lethal Injection in China*

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**Abstract:** Since 1997, execution in China has been increasingly performed by lethal injection. The current criteria for determination of death for execution by lethal injection (cessation of heartbeat, cessation of respiration, and dilated pupils) neither conform to current medical science nor to any standard of medical ethics. In practice, death is pronounced in China within tens of seconds after starting the lethal injection. At this stage, however, neither the common criteria for cardiopulmonary death (*irreversible* cessation of heartbeat and breathing) nor that of brain death (irreversible cessation of brain functions) have been met. To declare a still-living person dead is incompatible with human dignity, regardless of the processes following death pronouncement. This ethical concern is further aggravated if organs are procured from the prisoners. Analysis of postmortem blood thiopental level data from the United States indicates that thiopental, as used, may not provide sufficient surgical anesthesia. The dose of thiopental used in China is kept secret. It cannot be excluded that some of the organ explantation surgeries on prisoners subjected to lethal injection are performed under insufficient anesthesia in China. In such cases, the inmate may potentially experience asphyxiation and pain. Yet this can be easily overlooked by the medical professionals performing the explantation surgery because pancuronium prevents muscle responses to pain, resulting in an extremely inhumane situation. We call for an immediate revision of the death determination criteria in execution by lethal injection in China. Biological death must be ensured before death pronouncement, regardless of whether organ procurement is involved or not.

**Keywords:** execution by lethal injection; prisoners; organ procurement; organ harvesting; medical ethics; China

### Introduction

China is the only country in the world systematically using organs from prisoners for transplantation.<sup>1</sup> The harvesting of prisoner organs for transplantation violates international ethical standards. It is a fundamental principle in transplant medicine that organ donation must be made voluntarily, which in turn requires autonomous, informed decisionmaking. Even with informed “consent,” using organs from prisoners is not acceptable. Prisoners are neither free from coercion nor always fully informed, nor are they able to freely consent or decline without fearing any consequences, nor are their families.<sup>2</sup> For these reasons, the Transplantation Society (TTS)<sup>3</sup> and the World Medical Association (WMA)<sup>4</sup> are opposed to the recovery of organs from executed prisoners.

Moreover, organ procurement from executed prisoners in China is associated with severe human rights violations.<sup>5</sup> In addition to shooting, death sentences in China since 1997 have been allowed to be carried out by means of injection, performed either in mobile “death vans”<sup>6</sup> or in lethal-injection chambers.<sup>7</sup> In a recent

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publication, we discussed abuses in execution by shooting, including organ harvesting from still-living prisoners incompletely executed by deliberate shooting to the right chest instead of to the head.<sup>8</sup> In the present article, we take a closer look at the procedure of execution by lethal injection in China.

### The Interrelatedness of Execution and Organ Procurement in China

For four decades, China's transplant medicine program has relied on organ procurement from executed prisoners. Before 2010, there was no organ donation program at all. According to Chinese sources, there were as few as 130 voluntary postmortem organ donations in all of China from 1977 to 2009.<sup>9</sup> In a publication in 2008, it was disclosed that more than 90 percent of the transplanted organs in China were obtained from executed prisoners.<sup>10</sup>

In 2007, the Chinese Medical Association committed to ending organ sourcing from prisoners in a letter to the World Medical Association.<sup>11</sup> However, harvesting of prisoner organs did not stop. Even though in 2013, 38 hospitals stated in an agreement (the so-called "Hangzhou Resolution") to immediately stop using executed prisoners' organs, the ethically unacceptable practice continued, even in these hospitals.<sup>12</sup>

Finally, in December 2014, China announced that the country would completely stop the use of organs from executed prisoners for transplantation after January 2015. This announcement was welcomed and celebrated internationally as the endpoint of a formerly inhumane process of organ harvesting. This public announcement, however, is neither a law nor a regulation, nor has it so far been followed by any changes to China's organ donation laws or regulations. The use of prisoner organs remains legal, if "consent" is obtained from the prisoners.<sup>13</sup> Therefore, the implementation of the announcement is at least questionable.<sup>14,15,16,17,18,19</sup>

Since March 2014, China has openly announced a plan to integrate prisoner organs donated with "consent" into the citizen-based national organ donation system<sup>20</sup> in order to count these prisoner organs as "voluntary donations from citizens."<sup>21</sup> In 2015, Chinese transplant officials have repeatedly insisted that death-row prisoners have "the right" to donate organs and "if death-row prisoners are willing to atone for their crime by donating organs, they should be encouraged."<sup>22,23,24,25</sup>

In the question and answer section of the Chinese Organ Transplantation Development Foundation published on May 5, 2016, there was an explicit question (question No. 491) about organ donation by prisoners. The answer to this question was: "Provided that the basic conditions for organ donation are met, the organs are normal and the donation voluntary and unpaid, prisoners also can donate organs."<sup>26</sup> After this misleading and ethically disturbing statement had been reported by the *New York Times* on August 18, 2016,<sup>27</sup> the Foundation replaced the question with another unrelated question without any comment,<sup>28</sup> instead of changing the answer to the question. All in all, it has to be said that there is no evidence that the use of organs from prisoners has yet been prohibited by law in China.

### Execution by Lethal Injection in China

The first execution by lethal injection in China was carried out in Kunming City on March 28, 1997.<sup>29</sup> Since then, the practice has been gradually expanded. Liaoning was reported to be the first province that switched completely to lethal injection in December 2009.<sup>30</sup>

It has been reported that the Supreme People's Court has developed the drug regimen for lethal injection, and these drugs are used throughout the whole country. The identities and dosages of the drugs are kept secret.<sup>31</sup> What is known, however, is that there was a debate about the principle to be applied: either to induce death pharmacologically by using anesthetics and lethal drugs, or to simply poison the prisoners by using toxic substances. The authority finally did choose the first option.<sup>32</sup> This means that the drugs used for lethal injection in China are mechanistically not different from those used in the United States and/or other states in which lethal injection is part of the penal system. It is therefore plausible that three drugs (sodium thiopental, pancuronium bromide, and potassium chloride) are used,<sup>33</sup> especially if a meeting abstract of the 2009 conference of the Chinese Pharmaceutical Association is taken into consideration. This abstract indeed states that the drugs used for lethal injections in China are sodium thiopental, pancuronium bromide, and potassium chloride.<sup>34</sup> This is furthermore consistent with the reported fact that the lethal injection used in China consists of four injection solutions.<sup>35</sup> The fourth solution is very likely saline, used intermittently between the injection components to flush the infusion tube, thus avoiding drug precipitation.<sup>36</sup>

In the Provision on Issues in Execution by Injection issued by the Supreme People's Court in 2001, death was defined as fulfillment of all of the following three criteria: (1) cessation of heartbeat, (2) cessation of respiration, and (3) dilated and fixed pupils (diameter > 0.5 cm).<sup>37</sup>

In September 2001, a "working meeting on execution by lethal injection" was held in Kunming City. The attendees were invited to watch an execution at the site. In this demonstration case, the time from starting the injection pump to the pronouncement of death was less than 2 minutes.<sup>38</sup> In a case in Wuhan on June 8, 2002, journalists were allowed to be present and the family was allowed to follow the execution procedure via closed-circuit television. In this special demonstration case, death was declared within 3 minutes after the injection pump was started.<sup>39</sup> In routine practice, however, the time is even shorter. In an analysis article from the Intermediate People's Court of Lu'an City, it was stated that death is pronounced "within tens of seconds" after starting the injection.<sup>40</sup> By July 18, 2017, this article had been viewed 9,167 times since its publication on November 28, 2010, and the herein described practice of declaring death within tens of seconds has not ever been questioned.

### **The Concept of Death**

Most legal determinations of death in the developed world are made by medical professionals who pronounce death when specific criteria are met. In general, two categories of legal death are internationally established. Death as determined either by irreversible cessation of heartbeat and breathing (cardiopulmonary death), or by irreversible cessation of the functions of the brain (brain death). In the United States, for example, each state has laws for determining these two categories of death, laws that are modeled on the Uniform Determination of Death Act.<sup>41</sup>

Lethal injection-induced death differs significantly in its mechanisms from natural death or death caused by disease or organ failures. Lethal injection usually consists of sequential administration of sodium thiopental for anesthesia, pancuronium

bromide to induce muscle paralysis and respiratory arrest, and finally, potassium chloride to cause cardiac arrest.<sup>42</sup> However, these drugs do not immediately induce death. At the onset time point of cardiac arrest and respiration arrest, the cessation of heartbeat and breathing is still reversible and the brain is still functioning, although under deep sedation. Although the exact mechanisms of death in lethal injection are unclear, it is conceivable that death only occurs as a consequence of brain damage caused by the lack of cerebral perfusion following cardiac arrest, which is a process that requires several minutes. For this reason, the North Carolina warden, for example, declares death only after a flat line is displayed on the electrocardiogram (ECG) monitor for 5 minutes. Death is pronounced in the time range of 14 to 18 minutes after starting the lethal injection.<sup>43</sup>

By comparison, the Chinese practice of declaring death by lethal injection within “tens of seconds” after starting the lethal injection does not conform to any international standard and is not supported by any medical knowledge. First of all, it lacks standardized procedures of objective measurement for proving the cessation of heartbeat and respiration, as well as clear-cut regulations. ECG, for example, is not required for the confirmation of heart arrest in lethal injection in China.<sup>44</sup> According to the 2001 rule, death is determined by the forensic physician by examining heartbeat, respiration, and pupils. Without objective measurements, however, these determinations can be, at least partially, rather subjective.<sup>45</sup> Therefore, it is not clear whether cessation of heartbeat, cessation of respiration, and dilated and fixed pupils really happen within a time range of tens of seconds. Moreover, even if actually occurring within this short time range, they are still reversible at this stage and more likely result from the pharmacological effects of the injections rather than from the cessation of brain activity. Collectively, prisoners are declared to be dead in China from the procedure of lethal injection at the stage of cardiac arrest, respiration arrest, and anesthesia. Under these conditions, a human being is not yet dead according to the internationally accepted definition of death. To declare the death of a still-living human being is not compliant with the most fundamental ethical value, human dignity. The breach of ethical principles is greater if lethal injections become the sole precursor of the harvesting of prisoner organs, which will be discussed subsequently.

### Flaws in Execution by Lethal Injection

It has been reliably demonstrated that thiopental and potassium do not consistently result in death.<sup>46</sup> Analysis of postmortem blood thiopental level data from the United States indicates that thiopental, as used, may not provide sufficient anesthesia—for example, compared with surgical anesthesia—for the duration of the execution.<sup>47</sup> Further, available evidence indicates that a significant number of prisoners actually suffer extreme pain during lethal injection,<sup>48,49,50</sup> a clearly unethical and inhumane situation. The flaws in the United States cases include reported failures in intravenous access by untrained staff, drug precipitation leading to blockage of intravenous tubes, and inappropriate drug doses.<sup>51</sup>

In a Chinese article published in 2010, the question was posed whether comparable flaws in the practice of execution by injection would also occur in China, and the judicial authorities were strongly encouraged to evaluate the efficacy of lethal injection in collaboration with medical institutions.<sup>52</sup> Lethal injections in China are

in part performed by judicial police officers, and in other cases by forensic physicians or by invited medical doctors.<sup>53</sup> Although scientific articles on lethal injection in China are rare, drug precipitation and infusion tube blockage have been reported.<sup>54</sup> It has also been reported that the lethal injection in an execution case at the Intermediate People's Court of Hangzhou failed because the executioner was too nervous.<sup>55</sup> Possible reasons for failure in execution by lethal injection in China have been supposed to include low or incorrect drug dosage and insufficiently trained personnel.<sup>56</sup> Furthermore, it may be difficult for nonmedical staff (e.g., a judicial police officer) to perform intravenous injection correctly, particularly if prisoners are obese, diabetic, muscular, or cachectic.<sup>57</sup>

Therefore, it cannot be excluded that some of the executions by lethal injection were performed in China under insufficient anesthesia. The clinical picture of a seemingly peaceful process of dying does not necessarily indicate a painless death, but may be caused by pancuronium-induced paralysis. The inmate may potentially experience asphyxiation (pancuronium-induced muscle paralysis and respiratory arrest) and pain (potassium-induced burning) for quite a long time in cases in which the anesthetic effect of thiopental is insufficient.<sup>58,59</sup>

### **Organ Procurement from Prisoners Executed by Lethal Injection**

In the Chinese literature, scholars discuss three major factors in the comparison of lethal injection with execution by shooting. Lethal injection is considered to be more humane, more expensive, and, to provide organs of better quality.<sup>60,61,62,63</sup> The high quality of the organs hereby obtained for transplantation is generally perceived in China as a great advantage, as shown in published sources: "In cases of organs procured from execution by shooting, transplantation success rate is hampered by severe blood loss, too long a warm ischemia time, and tissue/cell degeneration of the organs, if organ procurement is performed after reaching clinical death. In execution by injection, the problems of blood loss and long warm ischemia time do not exist. Therefore, under the same condition [of the prisoner], execution by injection provides donor organs of superior quality."<sup>64,65</sup>

The use of prisoners as a source for transplant organs is against ethical standards deeply rooted in concepts of human dignity and autonomy. Harvesting organs from prisoners violates fundamental human rights that are interculturally and internationally accepted. If organ harvesting is performed in the context of execution by lethal injection, the ethical impact is even further aggravated. In cases in which thiopental's effect is insufficient and organ explantation begins immediately after cardiac arrest, the inmates may suffer from excruciating pain induced by organ explantation surgery, the surgical opening of the abdomen and/or chest. Yet this can be easily overlooked by the medical professionals performing the explantation surgery, because pancuronium prevents muscle responses to the sensations of pain.

From an ethical perspective, the use of death-row prisoners as an organ source has no justification whatsoever, even through pragmatic or utilitarian arguments (see aforementioned WMA and TTS policies). From a medical perspective, the hasty declaration of death in execution by lethal injection in China favors a quick yet inhumane shortcut to organ explantation, which violates professional standards.

## Suggestions

The death determination criteria currently being used in the process of execution by lethal injection in China conform neither to current medical science nor to any standard of medical ethics. Moreover, no objective measurements are required in confirmation of death. The organ explantation practice according to the death determination criteria currently being used is not compatible with any known medical and ethical standards. Only an irreversible loss of brain function can safeguard the inmate from inhumane practices and further offenses against human rights and dignity. Even though cardiac death is the legal standard in China,<sup>66</sup> injection-induced death differs significantly in its pharmacological context and physiological mechanisms. The current practice of certifying death immediately after cardiac and respiratory arrest is ethically not acceptable. Death must be ensured by clear-cut protocols such as those in the practice of death determination in the United States penal system: 5 minutes of cardiac inactivity shown on an ECG combined with a thorough clinical examination performed and documented by medically trained personnel and in the best case, augmented by further diagnostic tools such as electroencephalography. However, this suggestion should not be misunderstood as a contribution for improvement in the context of unethical and inhumane practices of organ harvesting in particular, nor as being supportive of death penalty in any sense. Hopes are, however, that if this inhumane practice cannot be brought to an end by the international community, we could at least contribute to the amelioration of suffering caused by inhuman practices of lethal injection.

## Conclusion

The unethical practice of organ procurement from prisoners should be addressed by the international community and prevented by international and national laws prohibiting the explantation, possession, implantation, and trade of prisoner organs. Beyond the context of organ procurement, death determination criteria for execution by lethal injection in China must be revised to reflect current scientific knowledge and to ensure respect for human dignity. Death must be assured (e.g., at least 5 minutes after cardiac arrest or by an end of brain electrical activity) before death pronouncement.

## Notes

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