

# Research progress on the ethical review of experimental animal welfare in medical colleges

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**Abstract:** Despite the existence of regulatory documents addressing the ethical review of experimental animal welfare in our country, medical colleges and universities continue to grapple with numerous challenges in conducting such reviews. These challenges encompass imbalances in the constitution of ethical review committees, constraints in the ethical review process for experimental animal welfare, and the absence of a comprehensive monitoring mechanism for these committees. This paper traces the evolution of standardizing the review of experimental animal welfare in our country, elucidating the challenges faced by medical institutions during the review process. It then advocates for specific measures, including the enhancement of legislation pertaining to experimental animal welfare ethics, the establishment of a multifaceted supervision mechanism for ethical reviews in medical colleges and universities, the implementation of educational programs focusing on experimental animal welfare ethics, and the refinement of personnel training systems.

**Keywords:** Experimental Animal; Laboratory Animal Welfare; Ethical Review

## 1. Introduction

The 21st century is an era of rapid development in life science, with laboratory animal science as an integral part that attracts significant attention both domestically and internationally. Although China has introduced relevant administrative regulations and national standards for the welfare of laboratory animals, specific laws are still lacking. There are still significant gaps when compared to the laboratory animal ethics review systems in European and American countries, which affects the smoothness of international academic exchanges and the international reputation of our researchers [1]. Each year, major medical colleges and universities in our country use a significant number of laboratory animals for medical talent training and scientific research. The welfare of these animals is closely related to the accuracy of the experimental process and results. Improper handling of laboratory animals can also cause certain moral damage to experimenters. Therefore, conducting ethical reviews on the welfare of laboratory animals should become a focus in teaching and scientific research at medical colleges and universities.

## 2. The development and current status of standardization of ethical review of experimental animals in China.

### 2.1. The development of standardization of ethical review of experimental animals in China.

Although a unified national standard has not yet formed, under the nearly ten years of efforts by the Professional Committee of Laboratory Animal Welfare Ethics in China, the ethical review of laboratory animal welfare in China has also gradually become guided by guidelines, and has received widespread recognition and praise from the international community [1]. In 1988, China promulgated and implemented the 'Regulations on the Administration of Experimental Animals', but with only one article concerning experimental animal welfare, stating that 'staff engaged in the work of experimental animals must take good care of, and not tease or mistreat, experimental animals'[2]. In 2001, the Ministry of Science and Technology, in collaboration with seven departments, issued the 'Interim Measures for the Administration of Experimental Animal Licenses', mandating that applicants must establish a system for reviewing experimental animal ethics. In 2000, the 'Regulations on the Administration of Experimental

Animals', which was first revised, stipulated that experimental personnel should carry out research on animal substitution methods in line with scientific principles. When the results of the experiment don't affect the animals, they should take effective measures to avoid unnecessary anxiety, pain, and harm to the animals. After the experiment, the animals should be disposed of in the least painful way. In 2001, the Ministry of Science and Technology, in collaboration with seven ministries and commissions, released the 'Laboratory Animal License Management Measures (for Trial Implementation)', mandating that applicants must establish an experimental animal ethics review system. In 2006, the Ministry of Science and Technology issued the "Guiding Opinions on the Ethical Treatment of Experimental Animals", which clearly stipulated for the first time that animal experiments must be approved by the Ethical Committee for Experimental Animals [3]. In 2018, this new national standard "GB/T35892-2018 Laboratory Animal Welfare Ethical Review Guidelines" (hereinafter referred to as the "Guidelines"), drafted by the Professional Committee on Ethics of Laboratory Animal Welfare, was officially promulgated. This stipulates the ethical review and management requirements for the production, transportation, and use of experimental animals [4]. The 'Guide' combines practical experience from Western countries, while aligning with international practices, also provides standards to address the irregularities in the ethical review of laboratory animal welfare in line with China's national conditions, signifying a new phase in the ethical review of laboratory animal welfare in China.

## ***2.2. The current development status of the ethical review of laboratory animal welfare in China.***

The rapid advancement of biotechnology and medicine cannot be separated from the contributions of experimental animals. The Western countries paid early attention to the welfare ethics of experimental animals, offering significant insights for China's reference. The ethical review system for experimental animals was initially established by the American Association for Laboratory Animal Science (AALAS) [5]. Before the mid-20th century, the mistreatment of laboratory animals occurred continuously, and there were varying standards of management among different laboratories. As a result, the American scientific community established the Institutional Animal Care and Use Committee (IACUC), which is composed of experts in laboratory animal care, physicians, laboratory animal managers, researchers who work with animals, and members of the public [6]. The IACUC is an ethical review committee for experimental animals, responsible for specialized review and approval of the necessity, reasonableness, and ethics of experiments on animals. Following the release of our country's guide in 2018, research institutions and organizations in our country have also established their own IACUCs. After further enhancing their ethical review systems for laboratory animal welfare, some, in an effort to quickly align with international standards, have sought certification from the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC). According to the official website of AAALAC, 93 organizations in China (including Hong Kong, Macao and Taiwan) have already received certification. However, only 6 out of 85 medical undergraduate institutions in Chinese mainland have passed the certification, which are the Institute of Medical Laboratory Animals at Peking Union Medical College, the Experimental Animal Center at Peking University, the College of Medicine at Shanghai Jiao Tong University, the Center for Drug Safety Evaluation at Zhejiang University, the Experimental Animal Research Center at Zhejiang Traditional Chinese Medicine University, and the Comparative Medicine Research Center at the University of Hong Kong. All certified institutions have improved their experimental animal welfare ethics review systems in accordance with the requirements of AAALAC. Apart from the aforementioned six universities, most of the other institutions are of a commercial nature. This indicates an urgent need for Chinese medical colleges and universities to align their experimental animal welfare ethics review with international standards, and emphasizing such review is also a necessary path towards enhancing international recognition in academic exchanges. The aforementioned ethical review institutions in Colleges and universities that have passed international certification do not constitute a significant proportion, but in the face of the enormous demand for ethical review of experimental animals, although the ethical review committees of various institutions have established sub-committees for the ethical review of experimental animal welfare in accordance with relevant rules and regulations or expert consensus to satisfy the review needs, they face many challenges in the construction of their standardized management and cooperation and exchange mechanisms.

### **3. The dilemmas faced by medical colleges in conducting ethical reviews on laboratory animal welfare.**

#### ***3.1. The uneven development of ethics committees for the welfare of experimental animals stems.***

Despite relatively comprehensive national standards, the lack of unified supervision has led to inconsistent enforcement and uneven development among different regions and institutions[7]. For instance, medical colleges in first-tier cities like Beijing, Shanghai, and Guangzhou place relatively more emphasis on experimental animal ethics review, enacting local regulations for supervision, while the same cannot be said for medical colleges in the central and western regions where focus is more on human ethics review and the review of experimental animal welfare lags relatively behind. Apart from regional differences, the compliance and reasonableness of the organizational structure of the Experimental Animal Welfare Ethics Committee also determines whether ethical reviews can be conducted effectively. The guidelines stipulate that the committee should consist of at least laboratory animal experts, physicians, laboratory animal managers, researchers who use animals, public representatives, and individuals from various sectors. No more than three members from the same subsidiary are allowed [4]. However, in the actual operation of the Ethical Review Committee for the welfare of experimental animals, due to the fact that most of its members come from the same unit, when the content of the ethical reviews conflicts with the unit's interests, they inevitably have to consider the pressure from their superiors and maintain a friendly demeanor with colleagues, which makes it impossible for the committee to carry out the reviews in a fair, impartial, objective, and neutral manner [8].

#### ***3.2. The drive to conduct ethical reviews on the welfare of laboratory animals is not strong.***

Apart from challenges at the institutional level, the review of laboratory animal welfare ethics must often meet the requirements of inspections or external journals during its implementation. Firstly, the concept of laboratory animal welfare ethics has yet to deeply resonate among the public. Ethical reviews find themselves in a passive situation. In 2019, Scholar Lin Jiaxi [9], through the analysis of 777 Chinese articles related to medical animal experiments, discovered that only 82 papers stated that they had received ethical approval, and only 14 had ethical review numbers stated. Furthermore, there are varying standards among journals regarding the acceptance and inclusion of articles after ethical review concerning the welfare of laboratory animals. Although most scientific journals require an ethical review report at the time of acceptance, thereby encouraging researchers to prioritize the welfare of laboratory animals, the ethical review requirements of each journal vary, with some only requiring an ethical review report without considering the qualifications of the review committee. Medical and scientific journals should expedite the consensus-building process for ethical review guidelines of animal experiments, thereby incentivizing research institutions to promote ethical reviews of experimental animal welfare.

#### ***3.3. The Ethical Review Committee for Laboratory Animal Welfare lacks a multi-dimensional regulatory mechanism.***

Without correct cognition of laboratory animal welfare, the experimental design and results will be lack of scientificity. Due to the weak awareness of the ethical review of laboratory animal welfare and the unclear understanding of the composition system of the ethical review committee in some medical colleges, it is easy for one person to have multiple duties. During the ethical review, it is possible that the results of the review may be falsified and other acts that violate the ethical principles of the welfare of experimental animals out of consideration for the interests of the unit. In practical scientific research, the ethics review committee should have two dimensional regulatory mechanisms. One is the full closed-loop supervision of the application for the ethical review of experimental animals; The other is that the work of the Ethical Review Committee for the welfare of experimental animals should also be subject to a higher level of supervision. The ethical protection of laboratory animal welfare possesses great confidentiality and unpredictability in practical scientific research. Although there are restrictions of ethical review before the experiments, without comprehensive and continuous supervision and management of the ethical review in the later stages, the ethical review of laboratory animal welfare will become a mere formality, and the full potential of the ethics committee cannot be realized. If the ethics committee lacks a higher level of supervision, it will be more difficult to ensure the impartiality and independence of the whole process when accepting the application for ethical review that has a conflict of interest with its unit. In addition, the lack of external supervision and coordination may also lead to inefficient review by the ethics review committee and repeated review of research projects, resulting in a

waste of human and material resources.

#### **4. Thoughts on improving the ethical review of laboratory animal welfare in Medical colleges**

##### ***4.1. Promoting the establishment of ethical review legislation for laboratory animal welfare at the university level.***

Law is the most effective means to govern and standardize behavior [10], and adopting legal measures to oversee the ethical review of experiments on laboratory animals results in twice the impact with half the effort. Compared to developed Western countries, the research on and practices of legislation concerning the ethical review of experimental animal welfare in China started relatively late. However, in recent years, with the continuous efforts of the Professional Committee for Ethics in Experimental Animal Welfare, initial results have been achieved. Apart from the aforementioned "Guidelines", a national standard that focuses on the welfare of experimental animals, and the "Regulations on the Administration of Experimental Animals", which underwent its third revision in 2017 and are administrative regulations, the legal field remains blank. Medical colleges and universities, as key locations for the use and management of experimental animals, should leverage their influence and provide suggestions based on practical scenarios, integrating these into reforms in medical humanities education, to effectively advance the legislative process of ethical review for laboratory animal welfare. The protection of laboratory animal welfare is not only related to the scientificity of scientific research, but also related to the cultivation of humanistic spirit of medical talents.

##### ***4.2. Establish a multi-dimensional supervision mechanism for the ethical review of experimental animals in Medical Colleges.***

In order to ensure the fairness, independence and efficiency of the ethical review of experimental animals in medical colleges, it is necessary to supervise the ethical review from both internal and external dimensions. Internally, we should improve the continuous closed-loop supervision system after the ethical review of laboratory animal welfare. The "Guidelines" clearly require the ethics committee to conduct daily inspections on projects already approved for animal experiments [4]. The ethics review committee can regularly and randomly inspect the experimental projects through both written review and on-site supervision. During the review process, the ethics review committee can negotiate with the experiment leader in advance about the time and location of on-site supervision and inform them of the specific content of supervision, to help the experiment leader prepare the necessary materials for the report [11]. The ethics review committee will evaluate and determine the project based on the results of the on-site review, possibly leading to its approval, rejection, or suspension. Externally, a single ethical review model can be used to establish a mutual recognition alliance or regional Ethics Committee (ERC) for the ethical review of laboratory animal welfare among medical colleges. This model could be used as a reference by medical colleges and universities, thereby integrating the high-quality resources of ethics review from schools and their affiliated hospitals in the region, thereby enhancing the overall quality of ethical reviews in the region[12].

##### ***4.3. Conduct education on the ethical understanding of laboratory animal welfare and improve the personnel training system.***

There should be a focused and phased approach to training and deepening for different groups involved in the ethical review of laboratory animal welfare. For members of the IACUC, in addition to a yearly training and evaluation schedule, opportunities for external learning, networking, and further education should also be provided, aiming to close the knowledge gap in laboratory animal welfare ethics with foreign countries. For researchers, a training system should be established, leveraging the ethical review committee for experimental animal welfare and the center for experimental animals. As the primary force behind scientific research at the university, the level of understanding medical postgraduates have towards experimental animal welfare ethics largely reflects the development of experimental animal welfare ethics at this university. It might be possible to incorporate education on experimental animal welfare ethics into the training program for postgraduates, thereby addressing the lack of understanding from a conceptual basis. Scholar gave an introduction to a hospital's development and application of software for managing the use of experimental animals and training personnel. The software integrates training, assessment, review, and regulatory electronic information. Only after the animal experiments are completed and pass ethical review, will the issuance of the laboratory animal

ethical review certificate take place. While minimizing human factor interference, it also enhances review efficiency, making it a valuable reference for major medical colleges.

## 5. Conclusion

In summary, attaching importance to the welfare of laboratory animals represents a sign of a maturing social civilization, and has now become a widespread international consensus. As China rises to become a leading force in global biomedicine, the welfare ethics of experimental animals is an essential component. As an important base for biological research, medical colleges and universities should shoulder the responsibility of standardizing the welfare of experimental animals. Whether it's through establishing regional ethics committees for the review of Ethical review of experimental animal welfare, aimed at ensuring the welfare of experimental animals and regulating the ethical behavior of researchers, or through educating researchers to raise their awareness of Laboratory animal welfare, the goal is to safeguard the welfare of experimental animals, standardize researchers' ethical conduct, and ensure the authenticity and scientific nature of the research outcomes.

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