Moving Beyond Animal Testing: Animal Rights and Scientific Alternatives

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In 2022, there were 3,521,143 animals used in research, teaching, or testing in Canada (Canadian Council on Animal Care [CCAC], 2023). However, this number is only representative of the institutions certified by the Canadian Council on Animal Care (CCAC), meaning that this number may be underestimating the total amount of animals used in all of Canada. Given the enormity of this number, we must examine whether the use of animals in research and testing purposes is, or is not, necessary for scientific advancement. Many Scientists, researchers and animal activists have debated this question over the years. Those in favor of animal testing argue that it is the best method to obtain scientific data for medical treatment without risking the harm, or lives, of humans. While the opposition, including animal activists and several animal researchers, emphasizes that animals feel physical pain and should not be subjected to this pain during testing. Animal testing should be prohibited because animals feel empathy and psychological pain (Li et al., 2018; Warren et al., 2013), are not protected by legislation (Black et al., 2022), there is inconsistencies between animal and human physiology (Akhtar., 2015), and the presence of viable alternative methods makes most animal testing unnecessary (Liebsch et al., 2011). Though these alternatives may not yet exist in all areas of research, animal testing is only justifiable when no viable alternatives exist, and when legislation protects these animals from experiencing unnecessary pain and suffering.

Research by Li et al. (2018) has shown that animals, such as rats, display empathetic responses and emotional pain for those they associate with, meaning that these animals should not be subjected to unnecessary emotional suffering during testing. The study conducted by Li et al. (2018) demonstrated that when a rat is displaying visual pain responses, like limping or licking the affect area, the other rat who is a familiar cage mate, "showed sharing and care by consolation through social approach, allo-grooming/allo-licking, and body-supporting toward the [affected] rat" (p. 242). This display of consolation towards the cage mate in pain indicates feelings of empathy within the rodent (Li et al., 2018). Most animals, including mice and rats, are commonly considered insignificant and inferior due to their perceived lack of emotional capability (Arnason, 2020). However, that notion is challenged by this display of a rat's empathy for the pain in those they socially associate with (Li et al., 2018). This demonstrates how we do not properly understand the emotional or psychological capabilities of animals. Evidence of empathy-based behavior also makes it more difficult to distinguish the ethical separation between humans and animals. In humans, seeing another person in pain can be distressing because we experience empathy (Singer & Klimecki, 2014). Since it has been demonstrated that rodents can also feel empathy, it may be emotionally distressing for them as well (Li et al., 2018). Animals are currently used as a replacement for humans in experiments because it is considered unethical to cause this emotional distress in humans during research (Behnke, 2009), but it is for this same reason that testing on animals would also have to be considered unethical. Ultimately, this emotional distress is an indicator that we must consider the extent and degree of psychological pain an animal experiences during experimentation.

Animals experience psychological pain during testing, which must be avoided because the harm it causes is identical to the harm caused by physical pain (Warren et al., 2013). After experimentation, Warren et al. (2013) observed how "mice that witness, but do not physically experience, stress have nearly identical changes in these classic stress measures as those subjected to [physical stress]" (p. 5). If these lab animals experience psychological pain in an equivalent manner to those who experience physical pain, then both forms of pain must be equally avoided. Especially since it will not only be the physical pain that the animal will endure during testing, but lasting psychological trauma as well. It is considered unethical to make a human endure psychological trauma which might have long-lasting effects on both their physical and mental health (Interagency Advisory Panel on Research Ethics, 2023). Now knowing that animals, including mice, are forced to endure this psychological trauma makes testing on animals unethical as well. Therefore, in addition to the legislation that protect humans from this pain or trauma during clinical testing, the legislation that would similarly protect lab animals from inhumane treatment must be improved and adhered to.

Canada's effort to protect lab animals is done through the Canadian Council on Animal Care (CCAC), however it is ineffective because it is only optional for research institutions to comply to. Black et al. (2022) conducted a review of the CCAC which explained how any institution receiving funding from the Canadian Institutes of Health Research (CIHR) or Natural Sciences and Engineering Research Council (NSERC) to conduct animal-based research is required to

follow CCAC guidelines, however, it is not required to comply with these standards if the institution is not receiving this funding. Consequently, the number and purpose of the animals used in the private research sphere of Canada cannot be reliably known or held to public accountability (Black et al., 2022). Considering that the CCAC certification has been made optional, it is easy to bypass or ignore the standards for the humane treatment of lab animals it is meant to outline and enforce. For instance, all a research group must do to avoid accountability under the CCAC, is receive funding from sources other than the CIHR or NSERC. Then there is little to stop experimenters from the callous or cruel treatment of their research animals. The lack of accountability or oversight also means that the public remains unaware and unable to speak out against any sort of unethical treatment that is conducted. It is for these reasons that there must be legislation that better protects lab animals from unnecessary harm. This could be done by making the CCAC certification mandatory for all research institutions conducting experiments involving animals in Canada. Ideally, the Canadian government could establish legislation and guidelines separate from the CCAC that bans certain types of experiments to better protect lab animals from unethical testing and experimentation. This way, all research personnel would have to uphold certain care standards and prevent unnecessary harm to these animals. However, proper legislation can only be established when we determine how necessary animal testing is for developing accurate predictions to better protect human lives in clinical trials.

The results found from animal testing are not always representative of the results found during human clinical trials. Akhtar (2015) examined cases of stroke therapies, among drug developments for other illnesses, where the translation of animal testing results to human clinical trials had a high failure rate despite the attempts to improve animal testing methods (p. 410). This was demonstrated in 2006 where all the human volunteers of an experimental drug trial suffered severe adverse reactions to the experimental drug, and ultimately led to systematic organ failure (Akhtar, 2015, p. 413). However, the animals used in the preliminary drug testing did not develop these issues even though they were given 500 times the human dose for at least four consecutive weeks (Akhtar, 2015, p. 413). Even with the knowledge that the scientific community has gained from animal testing, not all the results are an accurate representation of what happens in human anatomy. In some cases, the successful animal tests were misrepresentative of the effects in humans and actually led to the fatal harm human patients experienced during clinical testing (Akhtar, 2015). This blatantly contradicts the notion that animal testing can be used to reduce the harm of human clinical trial volunteers. Ignoring the ethical considerations of animal testing, this failure for animal models to predict results in humans means that the animal model holds no use as a precursor to human trials. It can no longer be used as a safety measure for drug testing and development because what is physiologically viable for the animals is not necessarily physiologically compatible for humans (Akhtar, 2015). Due to this questionable accuracy in the determination of human safety, the ethical nature of animal testing should now be considered. This unsuccessful translation between animal testing and human clinical trials means that we must pursue alternative methods of experimentation, then the ones currently practiced.

Scientists erroneously argue that animal testing is the most accurate method for finding new medications for human patients. For instance, Garattini & Grignaschi (2017) caution that animal testing is necessary because it would be unethical to test unproven chemicals in humans. They recognize that there are alternative methods for testing drugs, however, they point out that cell or tissue cultures are incapable of adequately mimicking the complexity of a living organism which is influenced by many factors, such as the hormonal system (Garattini & Grignaschi, 2017). They continue to give examples, such as the blood brain barrier, intestines, and liver which may change the chemical formula or distribution of drugs (Garattini & Grignaschi, 2017, pp. 32-34). While it can be agreed that animal testing may currently be the most beneficial method for understanding new medications, pathogens, or viruses, there is experimentation like cosmetic testing where alternative methods provide sufficient results. The Center for Alternative Methods to Animal Experiments (ZEBET), is a group that works to reduce the number of animals used for research by developing, modifying, or validating alternative methods for animal testing in many research areas including cosmetics (Liebsch et al., 2011, pp. 841-854). For example, epidermis layers can be reconstructed to create a human skin model in a petri dish by culturing a small sample of human skin cells, which acts as an "in vitro alternative to the rabbit test for skin irritation and corrosion" (Liebsch et al., 2011, p. 850). Even if there are not yet adequate models or systems for testing medical drugs or diseases in an entire organism, Garattini and Grignaschi (2017) fail to consider that this does not mean that all forms of animal testing are necessary. Considering the human skin model and other research methods supported by ZEBET, there are appropriate alternatives to animal testing for at least some experiments. These alternatives are important because they may test things like skin sensitization accurately but also avoid the unnecessary pain and suffering that it would cause a live animal. Since the test is being conducted in a petri dish, rather than directly on

the body of a living person, it avoids harming a human test subject. Also, these alternatives demonstrate the effects of toxins or drugs directly on the affected human cells, which helps avoid the issue of misrepresentation between animal and human physiology. If the same accuracy of results can be achieved through alternative methods, there is no ethical reason to continue the use of live animal testing for these types of experiments. Overall, the knowledge of alternative experiment methods must persuade countries like Canada to ban all animal testing that is not strictly necessary for accurate results.

On June 27, 2023, the Canadian government announced the passing of Bill C-47, which will amend the Food and Drugs Act to officially ban cosmetic testing on animals (Health Canada, 2023). Canada must continue to prohibit all unnecessary animal experimentation and improve the legislation to more effectively protect animals from inhumane treatment during research (Black et al., 2022). In addition to that, more resources or incentive should be put into finding better alternatives for medical testing, such as the development of a non-animal viable model to better predict or test the effects of new treatments on an entire organism. These changes must be made because it was shown that animals feel empathy and psychological pain, making the use of animal testing unethical (Li et al., 2018; Warren et al., 2013). The inconsistencies between animal and human physiology also makes animal testing and unreliable precautionary measure to human clinical trials (Akhtar., 2015). Though Garattini & Grignaschi (2017) argue that alternatives to animal testing do not yet exist in all areas of research, there are viable alternative methods that make most animal testing is only justifiable when no viable alternatives exist, and when legislation protects these animals from experiencing unnecessary pain and suffering.

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