than 70 times the recommended human dose produced no changes in the electrocardiogram.[16] Mitoxantrone is another drug where tests with laboratory dogs proved to be falsely reassuring. Developed in the hope of providing effective anticancer treatment without side-effects on the heart, mitoxantrone "failed to demonstrate cardiac failure" in beagle dogs.[17] However, in clinical practice cardiac toxicity has proved to be a major problem with several patients suffering heart failure.

The most serious side-effects of oral contraceptives are on the circulatory system placing women at increased risk of blood clots. Animal tests not only failed to predict the problems, but in dogs the "pill" had totally the opposite effect, actually prolonging blood clotting times.[18] And the anti-arrhythmia drugs encainide and flecainide, although apparently safe and effective in prolonged tests with dogs, were thought to *cause* heart attacks in some types of patients, leading to an estimated 3,000 U.S. deaths.[19]

In contrast, some drugs prove toxic or do not work in dogs but are comparatively safe and effective in people. Aspirin causes birth defects in many species, including dogs, but not in human beings,[20] and while tubocurarine is used as a muscle relaxant in clinical practice, in dogs it produces a dangerous fall in blood pressure and is to be avoided.[21]

Case Studies: Heart Valves and Contraceptives

Two detailed case studies show how reliance on dogs can delay therapeutic options. Since dogs are a favorite animal in cardiac research, many experiments were carried out on them to develop an artificial mitral valve. However, the experimental valves almost always produced fatal blood clots in these animals and, as a result, many surgeons were deterred from carrying out human trials.[22]

Like other experimental surgeons, Starr and Edwards encountered the familiar problem of blood clots but eventually decided on a "caged-ball" device. Other designs were uniformly fatal to the animals and while six of the seven dogs receiving the caged-ball valve died within 17 days, one did survive for some months. Fortunately the new valve proved far more successful in human trials where blood clotting was not a problem. The surgeons concluded that "the marked propensity of the dog to thrombotic occlusion [blood clotting] or massive embolization from a mitral prosthesis is not shared by the human being."[23]

After this the story becomes decidedly bizarre. Starr and Edwards wanted to carry out further animal testing of their caged-ball device but could not use the valve that proved so successful in patients because it nearly always killed the dogs. Instead they designed a different valve specifically for use in these animals! It nevertheless still killed most of them within 46 days. The surgeons stated that "species differences have therefore led to the use in this clinic of an unshielded ball valve for human mitral replacement, and a shielded ball valve as the prosthesis of choice for further testing in the dog."[23]

The steroid drug Depo-Provera has long been available as an injectable contraceptive in several countries, but in the United States approval was delayed for many years.[24] As a result American women were denied the option of an alternative form of contraception. Much of the controversy surrounding Depo-Provera focused on experiments with beagle dogs. These indicated a host of disturbing side-effects. There were abnormal growth problems, cases of breast cancer, and many animals died of pyometra, a condition in which pus accumulates in the uterus.

None of these effects have been observed in women taking Depo-Provera, and scientists point to physiological differences between human beings and dogs which make beagles especially sensitive to certain kinds of steroids.[25] In 1991 an editorial in the *Lancet* titled, "DMPA [Depo-Provera] and breast cancer: the dog has had its day," argued that "countries such as the United States, Australia and Japan would do well to reassess their existing policies on injectable preparations, otherwise they may deprive their female citizens of a reliable, effective and safe method of contraception."[24] One year later, the Food and Drug Administration finally decided to approve Depo-Provera as a long-acting contraceptive.

Campaign Focus

In recent years dogs have been the focus of numerous campaigns: Many physicians protested U.S. Surgical's use of live dogs to train its sales representatives in surgical stapling;[26] campaigners have called for an end to pound seizure, where local shelters supply dogs to the vivisection laboratory; and the use of "dog labs" to teach medical students has been increasingly exposed as unnecessary.

The very fact that these campaigns were necessary highlights society's double standards: While many Americans share their homes with dogs and have every reason to be thankful for their loyal companionship, experimenters are permitted to use the animals as if they were just another laboratory tool, where even anesthesia can be dispensed with if it interferes with the results. Like other animals, dogs have value in their own right—they are not ours to cruelly exploit.

Author's Postscript

When writing my book, *The Cruel Deception*, I decided to include an appendix of American animal experiments reported during the 1980s. Although by then a fairly seasoned campaigner, I was still shocked by some of the examples. In one case beagle puppies were burned using kerosene-soaked gauze which was then ignited.[27] Although anesthetized, the animals were later allowed to recover conciousness, and many died with burn-wound sepsis. These experiments were performed by the Shriners' Burn Institute-Cincinnati and the University of Cincinnati Medical Center.

In another report titled "Comparison of Tracheal Damage from Laser-Ignited Endotracheal Tube Fires," a blowtorch-type airway fire was produced in the anesthetized mongrel's throat, producing acute inflammation and ulceration.[28] The tests were performed by Northwestern University Medical School, Chicago and the Medical College of Wisconsin, Milwaukee. I do not know whether either of these experiments are continuing. ❑❑

References

1. *Animal Welfare Enforcement*, Fiscal Year 1991, United States Dept. of Agriculture, APHIS 41-35-008.
2. C. Holden, *Science*, July 14, 1989, pp. 124–125.
3. R. W. Summers & B. Hayek, *American Journal of Physiology*, 1993, Vol. 264, G1024–30.
4. M. F. Otterson et al, *American Journal of Physiology*, 1992, Vol. 263, G518–526.
5. K. Kuboyama et al, *Critical Care Medicine*, 1993, Vol. 21, pp. 1348–1358.
6. A. M. D'Alessandro et al, *Transplantation*, 1993, Vol. 55, pp. 695–701.
7. R. F. Raff et al, *Transplantation*, 1992, Vol. 54, pp. 813–820.
8. G. E. Billman, *Integrative Physiological & Behavioural Science*, 1992, Vol. 27, pp. 23–31.
9. A. Renaud et al, *European Journal of Pharmacology*, 1991, Vol. 205, pp. 11–16.
10. D. F. Bandyk et al, *Journal of Vascular Surgery*, 1993, Vol. 18, pp. 398–406.
11. G. Brock et al, *Journal of Urology*, 1993, Vol. 150, pp. 1306–1309.
12. O. P. McGuinness et al, *American Journal of Physiology*, 1993, Vol. 265, E314–E322.
13. J. M. Antario et al, *Urology*, 1992, Vol. 39, pp. 478–480.
14. M. J. Legato, *Journal of Molecular & Cellular Cardiology*, 1993, Vol. 25, pp. 501–508.
15. *British Medical Journal*, July 19, 1952, pp. 136–138.
16. R. N. Brogden et al, *Drugs*, 1982, Vol. 24, pp. 360–400.
17. R. Stuart-Harris et al, *Lancet*, July 28, 1984, pp. 219–220.
18. M. H. Briggs in *Biomedical Research Involving Animals*, (eds.) Z. Bankowski & N. Howard-Jones (CIOMS, 1984).
19. *Washington Times*, July 26, 1989.
20. D. F. Hawkins, *Drugs & Pregnancy–Human Teratogenesis and Related Problems* (Churchill Livingstone, 1983).
21. J. M. Hime in *The UFAW Handbook on the Care and Management of Laboratory Animals*, (ed.) UFAW (Churchill Livingstone, 1976).
22. G. H. A. Clowes, Jr., *Annals of Surgery*, 1961, Vol. 154, p. 740.
23. A. Starr & M. L. Edwards, *Journal of Thoracic & Cardiovascular Surgery*, 1961, Vol. 42, pp. 673–682.
24. *Lancet*, October 5, 1991, pp. 856–857.
25. *Bulletin of the World Health Organization*, 1982, Vol. 60, pp. 199–210.
26. See for example, *PCRM Update*, July–August 1991.
27. J. D. Stinnett et al, *Surgery*, 1981, Vol. 89, pp. 237–242.
28. R. H. Ossoff et al, *Annals of Otology, Rhinology & Laryngology*, 1983, Vol. 92, pp. 333–336.