

Exploitation and enrichment: the paradox of medical experimentation

M Brazier

Correspondence to:
M Brazier, School of law,
University of Manchester,
Oxford Road, Manchester M13
9PL, UK; margaret.r.brazier@
manchester.ac.uk

Received 14 March 2007
Revised 14 March 2007
Accepted 20 March 2007

ABSTRACT

Modern medicine is built on a long history of medical experimentation. Experiments in the past often exploited more vulnerable patients. Questionable ethics litter the history of medicine. Without such experiments, however, millions of lives would be forfeited. This paper asks whether all the “unethical” experiments of the past were unjustifiable, and do we still exploit the poorer members of the community today? It concludes by wondering if Harris is right in his advocacy of a moral duty to participate in medical research.

In his compelling analysis of the state of modern medicine, *Hippocratic Oaths*, Raymond Tallis rightly claims that “...scientific medicine is one of the greatest triumphs of humankind”. Yet in 2008, medicine, for all its marvels, still often attracts distrust and suspicion. As Tallis¹ puts it, “the talk is all of doom and gloom”. Consider, for example, the controversy following revelations about retention and research on human body parts in the United Kingdom (Tallis p187-99).^{1, 2} Medical research in particular arouses controversy. The media are ever ready to accuse researchers of exploiting vulnerable “human guinea pigs”.³ Yet the basis of scientific medicine depends on medical research, what Tallis calls “...the pursuit of objective knowledge” (Tallis, p14).¹ Were it not for that pursuit of knowledge, this author and many of the readers of the journal would not be alive today. Childbirth, disease or premature ageing would have seen us in our graves long ago. We owe our lives to “research” carried out over the centuries.

Much of the ethical debate about the moral legitimacy and appropriate regulation of medical research dates from the outrage generated by revelations in the Nazi war crimes trials.^{4, 5} That the Nazis were far from alone in committing atrocities in medicine’s name is well known within the medical profession and the bioethics community, but less well publicised more generally.⁶ Nor did the Nuremberg Code and the subsequent Declaration of Helsinki bring an end to flagrantly unethical research.^{7, 8} In this paper, however, I want to travel further back in time to explore an age-old paradox. Medical research has enriched our lives, and those of our ancestors. Yet such research routinely exploited the poor and the vulnerable. In delving back into history I should, I acknowledge, change my language. The surgeons of the 18th and 19th centuries did not conduct clinical trials as understood today. They experimented on their patients. What I hope to show is that to regulate research appropriately today, we should not see

1945 as the beginning of history, but recognise that some of the problems we struggle with in the twenty-first century date back hundreds of years. I shall argue that we have not solved those problems. Medical research still depends heavily on recruiting more vulnerable members of society both in the developed and the developing world.⁹ Research subjects continue to be exploited in the sense that their participation in research trials is obtained within conditions that the more fortunate members of our community would refuse to contemplate. If we are to eschew exploitation, history suggests that John Harris may be right in his advocacy of a duty to participate in scientific research.¹⁰

POOR (LIVING) GUINEA PIGS

Ruth Richardson¹¹ has charted the troubled history of the Anatomy Act 1832 whereby the dead bodies of the poor were conscripted into the service of science. I will return to experiments on the dead a little later. Richardson emphasises that the poor were equally at risk of becoming living guinea pigs. She quotes a letter from the distinguished surgeon GJ Guthrie¹² to Sir Astley Cooper:¹³

The poor frequently object to enter [hospitals] because they think they may be experimented upon. And it be admitted to men of education that when an operation is to be tried for a first time it is generally done in a hospital (Richardson, p164).¹¹

The “hospital” referred to would be either one of the charitable institutions, such as St. George’s Hospital in London, or a workhouse infirmary. Neither institution was frequented by patients who had the means to pay for medical care. Richardson (p193)¹¹ also quotes George Eliot’s *Middlemarch* where the worthy Mr Standish declares:

...I am not going to hand money out of my purse to have experiments tried on me. I like treatment that has been tested a little.¹⁴

Mr Standish was not, and is not, alone. We all prefer tried and tested treatments. Few of us enrol in clinical trials.

In 17th and 18th century England, the numbers of charitably funded hospitals rose dramatically. Those who subscribed to such hospitals and those who practised in them, were no doubt motivated in part by a desire to relieve the “poor-sick”.¹⁵ Such hospitals also offered a fertile training ground for medicine and medical research.¹⁶ So a hospital in Winchester is described as:

...of infinite Use to All Other Persons as well as the Poor, by furnishing the Physicians and Surgeons with more experience in one Year than They could have in ten without it. (Elmer & Gregg, p165).¹⁵

Once an inmate in hospital, the indigent patient was at the mercy of his doctors. Disease stalked the wards. Unregulated experiments were often of little utility to the patient or the wider community. Surgical staff at such hospitals were mostly unpaid. Their income derived from the pupils they attracted, (Richardson, p363-4)¹¹ and the opportunity to boost their reputation and thus their private client list. Medicine was a competitive market place with different species of doctors (physicians, surgeons and apothecaries) battling for dominance. Physicians enjoyed the highest social status. Paradoxically, these grandees of medicine distanced themselves from research until well into the 19th century (Porter, p229-30).¹⁶ The surgeons (usually also anatomists) dominated “research”.

The fate of most of the living human guinea pigs from the 17th and 18th centuries is little known. They lived and died in obscurity. However, we can find informative accounts of experiments which undoubtedly exploited the vulnerable, but also enriched medicine.¹⁷ Porter (p363-4)¹⁶ recounts the work of the American surgeon, James Marion Sims. He developed surgery to correct vesico-vaginal fistulae, experimenting on female slaves who had suffered this then common complication of childbirth. Sims has been the subject of vigorous criticism for his unethical behaviour in experiments on enslaved women.¹⁸ A modern American obstetrician has recently come to his defence.¹⁹ Any account of his work is gruesome. Sims operated on his first patient (or subject) at least thirty times without anaesthetic. Ultimately his work succeeded. He developed a technique which saved women from the horrors of double-incontinence, and so often from both isolation and consequent death. No ethics committee vetted Sims’ experiment. We may doubt whether informed consent was obtained. No wealthy lady would have been likely to submit to 30 experimental operations. Yet gynaecology made a major development. Sims’ “...patients then and countless thousands of women since, benefited from his success”.¹⁹

Sims’ work is instructive. We should note that it would be classified today as *therapeutic* research. His enslaved subjects stood to gain. And this may be equally true of many of the patients experimented on in the public hospitals and workhouse infirmaries. The aversion to entering any hospital meant that those who entered the hospital would be grievously ill. The surgeon would be their last hope. The “experiment” conducted on them would lie exactly on the boundary of “experimentation” and what we might now call innovative medicine.

Judging the past is a task fraught with danger. It is easy to slide into cultural relativism. It is equally easy to be swayed by appearances alien to modern niceties. The British surgeon John Hunter, made an unrivalled contribution to modern surgery. His insistence on questioning established practice, his knowledge of anatomy and his surgical experiments, laid the foundations for operations still performed today. One of his earliest experiments was performed on a hackney coach driver suffering a popliteal aneurysm at the back of his knee. The lump was agonisingly painful and the patient, on admission to St. George’s Hospital, could barely walk. The traditional options for treatment were for physicians to administer useless medicines followed by an early death, or the leg could be amputated by a surgeon. Once his leg was amputated, the man would be unable to work. He and his family would be destitute.

Hunter proposed to attempt a new form of surgery tying the artery at the thigh. Wendy Moore²⁰ describes the operation vividly. As was the practice of the time, the unfortunate patient was held down by Hunter’s assistants. Neither anaesthetic nor antiseptic were yet in use. The operation was witnessed by an audience of both interested doctors and the general public. The coachman was both guinea pig and spectacle.

The man survived and Hunter’s operation became standard treatment. Moreover, grisly though the circumstances appear, was the experiment unethical? The evidence suggests that Hunter took pains to explain what would be done, and obtained the man’s consent. That the patient’s other options were so limited cannot be blamed on Hunter. Hunter set his own standards to regulate his practice declaring both that he would not operate unless the patient “acquainted with the consequences of the disease” desired him to do so, and that he would perform no procedure that “...I would not have performed on myself were I in the same situation”.²¹ It might be questioned whether the coachman’s surgery should properly be classified as experimental. Or was Hunter simply a last ditch chance to save his patient’s life? I would argue that the operation on the coachman must be seen in the context of Hunter’s own agenda. He had tested and refined the procedure on countless animals (Moore, p30-3).²⁰ He actively sought an opportunity to test his emergent skill on a human patient. As with much experimental therapy, Hunter’s motives were mixed. He sought to benefit the coachman; he also sought to add to knowledge.

The wealthier citizens who used the coachman’s services might well have avoided becoming experimental subjects. Afflicted by the same condition as the coachman, their fate would be likely to have been a protracted and expensive death, little eased by the remedies advanced by their personal physicians. Perhaps the refusal to experiment, and to risk failure should be seen more unethical than Hunter’s risk-taking?

Hunter’s coach driver, like Sims’ slave patients, stood to gain from being guinea pigs. What of another well known experiment at the end of the 18th century? Hunter’s pupil, Edward Jenner, injected an eight year old boy, James Phipps, with cowpox. Months later, he injected the boy with small pox. The vaccination “took” and the boy survived. Jenner’s experiment has saved millions of lives and led to the virtual eradication of smallpox. Weatherall²² notes that it has often been said no modern ethics committee would have sanctioned such an experiment. Consider the case—the experiment used a child subject, who was too young to consent for himself, in non-therapeutic research where there was a high risk of death or disfigurement. The “exploitation” of James Phipps undoubtedly saved the lives of some of us reading this journal today.

RICHER (LIVING) GUINEA PIGS

Patients at charitable hospitals may have been the main source of research subjects in the 18th and 19th centuries. “Private” patients were usually treated at home so were less likely to be candidates for experiments needing the facilities (however primitive) of a hospital and its staff. Paying patients however were also on some occasions “experimented” on. The paucity of evidence of how the law viewed surgical research derives in part from the very obvious point that patients too poor to pay their doctors would not have been able to afford a lawyer. Mr Slater, however, could afford both. He broke his leg while away from home. The leg was set by a surgeon and a callous formed. After nine weeks, Mr Slater was well enough to return home. He could walk with crutches. The first defendant, Mr Stapleton, an apothecary, was sent for to remove the bandages. He in turn

summoned the surgeon, Mr Baker. Both doctors took the view that the leg needed to be straightened by an operation of extension to avoid further complications and disability. The procedure disunited the callous that had formed over the fracture. Mr Slater remained in pain and ill for some further months. He refused to pay Stapleton or Baker, and he sued for damages on the grounds that the defendants ignorantly and unskillfully broke his leg again.²³ A multitude of experts were called. The majority testified that established practice was not to disunite a callous unless a leg had set “very crooked”. The experts suggested that Mr Baker wanted to try an experiment with his new instrument.

The court found for Mr Slater, essentially on two grounds. (1) The defendants acted “ignorantly and unskillfully, contrary to the known usage of surgeons” and (2) It “...was improper to disunite the callous without consent”. A patient must be told what is to be done to them that they “...make take courage and put himself in such a situation as to enable him to undergo the operation”. This second ground endorsing the need for consent cannot be quibbled with. What of the judges’ judgment on experimentation? The court condemned the procedure as rash. Yet, within a few years, Baker’s rash experiment became standard treatment for fractures (Mason & Laurie, p668).⁴ Future patients benefited. Too ready a condemnation of experiment excludes the hope of such benefit. The court’s suspicion of experiment in *Slater v Baker and Stapleton* is not an isolated example of judicial qualms about innovative medicine. In the 17th century, the College of Physicians enjoyed quasi-criminal powers to punish *mala praxis*. In *Dr Groenvelt’s Case*,²⁴ Holt CJ endorsed the view that *mala praxis* was a “great misdemeanour” “...whether it be for curiosity and experiment or by neglect”. Negligence and experimental medicine seem to be viewed as one and the same.

Perhaps it is the case that Mr Baker took less care to obtain his paying patient’s consent than did John Hunter with his impoverished coachman. The fundamental question in both cases and that of the boy, James Phipps, is what magnitude of risk should law and ethics sanction? And what will persuade the experimental subjects to run such risks?

RICH AND POOR (DEAD) GUINEA PIGS

Fears of experimentation while still alive may have kept the “poor-sick” away from the hospitals of Georgian and Victorian England. That fear paled into insignificance in comparison with the horror of being dissected when dead. Legislation in the reign of Henry VIII allowed the Company of Surgeons a limited number of the bodies of executed criminals (Richardson, p33-4).¹¹ In 1752, a statute “for better Preventing the Horrid Crime of Murder” allowed judges to impose dissection as an additional penalty to hanging (Richardson, p35).¹¹ Dissection and post mortem examinations became inextricably linked in the public mind with crime and infamy. Religious belief in the literal resurrection of the body bred a horror of the mutilation of the body. A shortage of bodies to dissect led to the grave robbing enterprise of the Resurrectionists, and ultimately the murderous activity of Burke and Hare. There can be no doubt that those same doctors who were laying the foundations of medical science were at the least complicit in body snatching (Moore, p84-97).²⁰ The remedy ultimately endorsed by government was the Anatomy Act 1832 giving legal sanction to the snatching of the bodies of those paupers who died unclaimed in the workhouse. The history of dissection in the 18th and 19th centuries is peopled with outrage and literal riots. Anatomists thought to be in league with, or trading with, the

Resurrectionists were at risk of their lives. The Anatomy Bill sparked riots. After the Act became law, the anatomy school at Cambridge was attacked in 1833, and in 1835, the school in Sheffield was completely demolished (Richardson, p263).¹¹

The subterfuge and outright theft used to obtain corpses before 1832 and the discriminatory treatment of the poor within the 1832 Act cannot be excused. The knowledge generated from those stolen bodies was invaluable. It was the meticulous teaching of anatomy which began to transform medicine from quackery into science. Hunter’s successful experiment on the coachman depended on his years of practising dissection to understand the arterial system. Enrichment depended on exploitation. It did so in part because of a degree of hypocrisy among the rich, and even those doctors who themselves practised anatomy and surgery.

William Hunter, elder brother of John, was equally involved in procuring bodies for dissection and more anxious about his public reputation as a great scientist. He gave instructions to ensure no autopsy was performed on his body and his corpse was secured in a vault (Moore, p418).²⁰ The Anatomy Act 1832 provided for the post of Inspector of Anatomy to oversee the Act. Only one Inspector has ever bequeathed his body for dissection. The richer and better educated sector of society in the 18th century tended to deride the superstitious fears of the poor relating to dissection, just as they do today. Most took pains to ensure that their bodies would never be dissected. Just a few, including the botanist, Daniel Solander, and the Prime Minister, the Marquess of Rockingham, authorised post mortem examinations in advance of their death (Moore, p412-4).²⁰ A few aristocrats took pleasure from the prospect of their body parts being displayed in pathology museums (Moore, 427-8).²⁰ However, voluntary bequests by the rich were too few, and did not exclude a need for the bodies of the poor. The Anatomy Act 1832 created a climate of fear and suspicion that endures today. Fear of a lack of funds to pay for a “decent” funeral still prompts older people to pay for expensive insurance to cover their obsequies. Folk memories of the dissectors’ knives persist. We can only speculate why dissection and research on dead bodies angered our ancestors more than experimenting on the living. Maybe there are two principal reasons? First, could patients see that some benefit was at least possible from experimental surgery? Second, the sheer discrimination in a system where relatively wealthy medical practitioners sang the praises of anatomy and dissection, but it was the poor’s bodies that were cut up, must have had its effect.

WHAT SHOULD WE LEARN FROM HISTORY?

The fierce controversy unleashed by the publication of the Redfern Report²⁵ into organ retention in Liverpool seemed at the time to be without modern precedent. The pain and anger of families who discovered that parts of a relative’s body had been retained was matched by dismay on the part of many scientists that such fury should be aroused by routine practice (Tallis, p187-90, 192-5).[41] No-one who had read Ruth Richardson’s book on the Anatomy Act 1832 should have been surprised. We had forgotten too much and learned nothing from history.

Medical research is heavily regulated today. The well-being of the human subject is given the highest priority and accorded precedence over the interests of science and society.²⁶ Harris questions privileging research subjects at the expense of those who will benefit from research.¹² James Phipps, and Sims’ slave subjects, were accorded no such privilege. Those experiments would not be allowed today in the form they took centuries ago. Declaring that people who had been on benefits for more

than 20 years of their working life would automatically have their corpses confiscated for medical education and research, would be likely to provoke a riot, even today. Without research on the living, and investigation of the bodies and the body parts of the dead, medicine will stultify. It is well known that the demand for organs for transplant exceeds supply.²⁷ Concerns have been expressed that too few bodies were being donated under the Anatomy Act 1984 to meet the needs of teaching future doctors.²⁸ Society needs more people to be willing to be research subjects in life, and after death. That need is no less than it was two centuries ago.

Nor has much changed in terms of recruiting research subjects. The disastrous outcome of the recent trial of a new monoclonal antibody drug which left six young men in intensive care has been much publicised.²⁹ The subjects were all paid volunteers. Debate has focused on *inter alia* the use of payments as inducements to consent and the degree of risk to which the young men were exposed. Litigation is likely. The full facts remain to be elucidated. Two points are relevant to this paper. (1) The level of payment (£2000) was of itself unlikely to attract anyone who was not in some immediate need of cash. Students,³⁰ the unemployed, and resting actors make up the majority of research subjects in non-therapeutic trials. The poor are still more commonly research subjects than the rich. (2) It seems that volunteers were warned of the risk of a "...cytokine release [causing a hives-like allergic reaction] or anaphylaxis [a generalised allergic reaction that can be life-threatening]"³¹

The volunteers have suffered terribly to benefit others. Privileging them absolutely might mean that any life-threatening risk should never be allowed. Without any inducement, it may be that none of the volunteers would have entered the trial. Harris sees no objections to financial inducements. I remain dubious. In an unequal society, the risk of economic duress should not be taken lightly. The need for, or lure of, cash may impair the potential subject's ability to make the necessary risk/benefit analysis required to give an informed consent. What does seem clear is that if medical research is to flourish, society must *either* overtly accept a role for inducements to participate in research, and to "donate" our organs and bodies, *or* all of us must see participation in medical research as a social obligation. If we follow the route of allowing inducements in terms of financial reward, must we vastly increase the level of reward to an amount sufficient to attract this Journal's learned editors? Perhaps not, as society accepts very different rewards for contributions to its overall well-being. Nor are the levels of such rewards always based on objective merit. I am paid more for my pleasant life of the intellect than the nurse labouring to care for the sick. That discrepancy of itself does not necessarily render society's payment of nurses, exploitation. The issue for the nurse and the research subject is whether the payments (inducements) made to them are a fair reward for what they are asked to do. Putting your health at risk in medical research demands substantial reward, at a level high enough to ensure that poverty alone does not motivate participation. So rewards must be increased, or we must accept the exploitation of the poor as the price of enrichment of our health.

I find myself in agreement with Harris's diagnosis of a moral obligation to participate in research. I would prefer a different "cure". And that would be a general willingness to volunteer to accept risks to benefit us all. I am a coward. I have agreed to be a Biobank volunteer and participated in a therapeutic research trial of new forms of anaesthetic agent. Would I take greater risks and suffer pain? I do not know. But there are many other

things which I know I ought to do that I do not. Is it unrealistic to call for altruism in an increasingly materialistic society? It may be so. Yet I am not convinced that altruism in the contexts of participation in research or donation of organs has ever been fully tested. Insufficient efforts have been made to recruit volunteers and donors without promise of material reward. Millions of pounds have been expended in advertising to encourage people to stop smoking to benefit their own and others' health. Advertisements to encourage participation in research (or donation of organs) are few and far between.

Acknowledgements: The author acknowledges the stimulus and support of the European Project (EU-RECA) sponsored by the European Commission, in the preparation of this paper (D-S Research as part of the Science and Society research programme - 6th framework). And I am grateful to the two referees, A Alghrani, S Devaney, S McGuinness, M Quigley and C Stanton for comments on earlier drafts of this paper.

Competing interests: None.

REFERENCES

1. **Tallis R.** *Hippocratic Oaths*. London, Atlanta Books, 2004:1.
2. *Remembering the past; looking to the future* Final Report of the Retained Organs Commission, 2004 HMSO.
3. See, for example, Elephant man drugs firms seeks more volunteers. *The Daily Mail* 29 April 2006.
4. **Mason JK**, Laurie GT. *Mason and McCall Smith's Law and Medical Ethics*. 7th edn. Oxford: Oxford University Press, 2005:648–51.
5. **Annas G**, Grodin M, eds. *The Nazi doctors and the Nuremberg Code: human rights in human experimentation*. New York, Oxford University Press, 1992.
6. In particular, the notorious 'Tuskegee study' and the Willowbrook experiments in the USA; see Annas, G.T. *The Rights of Patients* 2nd edn., New Jersey, Humana Press, 1992:146–7.
7. See **Plomer A**. The Law and Ethics of Medical Research: International Bioethics and Human Rights London. Cavendish Publishing, 2005:29–30.
8. **Beecher H**. Ethics and Clinical Research. *New Engl J Med* 1964;**274**:1354–60.
9. Nuffield Council on Bioethics *The Ethics of Research Relating to Healthcare in Developing Countries*. (2002); available at www.nuffieldbioethics.org.
10. **Harris J**. Scientific research is a moral duty. *J Med Ethics* 2005;**31**:242–8.
11. **Richardson R**. *Death, dissection and the destitute*. 2nd edn. Chicago: Chicago Press, 2000.
12. The two men were in correspondence about the progress of the Anatomy Bill.
13. Surgeon to the King and later to become President of the Royal College of Surgeons.
14. **Eliot G**. *Middlemarch*. 1871, Chapter 10.
15. As they are described by the Dean of Exeter, responsible for setting up the Devon and Exeter Hospital; see Woodward, J. An Account of the Establishment of the County Hospital at Winchester in *To Do the Sick No Harm: A Study of the British Voluntary Hospital System to 1875*. London and Boston, Routledge and Kegan Paul, 1974 at 149–52; extracted in Elmer P, Gregg OP. *Health and disease and society in Europe 1500–1800* Manchester, Manchester University Press, 2004:163–6.
16. See **Porter R**. *The greatest benefit to mankind: a medical history of humanity from antiquity to the present*. London, Fontana Press, 1999:292–3.
17. **Davies H**. The importance of both research and proper review: a historical perspective. *RER* 2005;**2**:40–6.
18. **Ojanuga D**. The medical ethics of the 'father of gynaecology', Dr J Marion Sims. *J Med Ethics* 1993;**19**:28–31.
19. **Wall LL**. The medical ethics of Dr J Marion Sims: a fresh look at the historical record. *J Med Ethics* 2006;**32**:346–50.
20. **Moore W**. *The Knife Man*. London: Bantam Books, 2005:17–39.
21. **Palmer J**, ed. JH The Works, vol. 1, *Lectures on the principles of surgery*. London: Lanaman, Rees, Orme, Brown, Breen. 1835:210.
22. **Weatherall D**. *Science and the Quiet Art: Medical Research and Patient Care*. Oxford: Oxford University Press, 1995:70–1.
23. Slater v Baker and Stapleton (1797) 95 English Reports 860.
24. 9 Will. 3 B.R. 1697.
25. The Royal Liverpool Children's Inquiry Report. London: HMSO, 2001.
26. World Medical Association *Declaration of Helsinki* 2000.
27. NHS Blood and Transplant. *Transplant Activity in the UK*. 2005–6; 4–5.
28. *The Guardian*, 30 January 2006. Note that the Anatomy Act 1984 is now repealed and replaced by the Human Tissue Act, 2004.
29. See MHRA Investigations into Adverse Incidents during Clinical Trials of TGN142 Clinical trials suspension interim report (2006) (www.mhra.gov.uk); Department of Health Expert Scientific Group on Phase One Clinical Trials Final Report (HMSO, 2006).
30. **Mandeville K**. My life as a guinea pig. *BMJ* 2006;**332**:735–6.
31. *The Observer* 09 April 2006.