Reviewer's report

Title: Refining animal models in fracture research: seeking consensus for changing the agenda in optimising both animal welfare and scientific validity for appropriate biomedical use

Version: 1 Date: 7 February 2007

Reviewer: Paul Flecknell

Reviewer's report:

General
This is a timely and important paper, that deals with complex and difficult issues. Many of the points made and concerns raised have applications to many areas of research that involve the use of animal models. I therefore strongly recommend publication. However, in order to have a significant impact, some short-comings in the manuscript should be addressed. My main concerns are as follows:

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

1) The report is excessively long, and as such is unlikely to be read in detail by the target audience. A significant reduction in length could be achieved by avoiding repetition of key points in each of the sections. The current document contains separate sections dealing with each of the broad types of animal model (eg for fracture repair, implant testing etc). I suspect these were drafted by different individuals on the working group, who all make similar points – the need for standardised models, the need for good study design, for competency in surgery and anaesthesia etc. These are all valid points, but do not need to be repeated, and dealt with at length in each section. Carefully selected examples to illustrate the confounding influences of these factors, for each of the groups of models mentioned, could be included in a single general section. Alternatively, a table of the model groups with examples could be provided.

2) The sentence structure is often over-long, making the text very difficult to read – even for someone with English as a first language. This report will be of international interest, and I strongly advise editing of the style of the manuscript to make it more accessible. This would also provide further opportunity for reducing it in length.

3) There are a few sections that require grammatical corrections but these can easily be addressed in the editing process.

4) The majority of statements made are referenced appropriately, but some quite contentious areas are not supported by references. For example, on page 12, the discussion of pain and its consequences makes many statements that are only supported by references to the IASP education curriculum. It would be far better to reference this section more fully. The whole area of analgesic use in musculoskeletal research is contentious, and it is disappointing that the document does not address this more directly. Simply stating that “concerns have been raised...” does not provide any support for ethics committees that may be requiring analgesic use following musculoskeletal surgery. Some more definite statements about the relative effects of analgesic use compared to other sources of variation in such studies would be of value.

5) The statement “Unfortunately, human surgeons sometimes appear to lack compassion for their research animals...” on p26 is rather contentious, and is not supported by any data. I agree that examining the reported frequency of analgesic use in papers in this field suggests a lack of concern, it may simply reflect a lack of awareness of the potential animal welfare consequences of their research.

6) Although I agree that obtaining input and advice from veterinary professionals is important, the number of veterinary anaesthesia specialists with further research qualifications is relatively low. Similarly the number of laboratory animal specialists with high levels of expertise in anaesthesia and analgesia is also limited. This imposes some practical constraints on implementing some recommendations. I support the recommendations, but the need to develop appropriate professionals to support research perhaps should be highlighted.

In summary, this is a potentially high impact report that is significantly weakened by its excessive length. I strongly recommend redrafting to make it more readily accessible to its intended audience.

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Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)
Discretionary Revisions (which the author can choose to ignore)

**What next?:** Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

**Level of interest:** An article of outstanding merit and interest in its field

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

I declare that I have no competing interests