Postsurgical Pairing: A Discussion by the Refinement & Enrichment Forum

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"How safe is it to allow pair-housed animals to remain together when one of them is recovering from surgery" (Anonymous)?

"It is my experience with rhesus macaques that it is advisable to pair an animal after surgery as soon as possible with his or her compatible companion. We did this especially with animals after one of them had head cap implant surgery (**Figure 1**). It was the investigator's and my own subjective feeling that the animals recover better from the surgery stress when their familiar companion is with them than when they are alone.

Figure 1. Young rhesus macaque two days after head cap implantation surgery in company of her adult cage mate who is tethered for remote blood sampling.

I should perhaps emphasize the obvious, that we established new pairs well *before* surgery and always made sure that the animal who had undergone surgery had regained *full consciousness* before the companion was transferred to the post-surgery recovery cage" (Reinhardt).

"I agree, rhesus macaques do much better during postsurgical recovery when a compatible companion is with them" (Anonymous). "I would assume that the companion alleviates anxiety, fear and disorientation in the unfamiliar postsurgical recovery cage. Unfortunately, this question has not yet been examined scientifically and the results published. It has been demonstrated, however, not only in human and nonhuman primates but also in rodents, ruminants and birds that the presence of a compatible conspecific has a stress-buffering effect.1-15 Postsurgical recovery under social isolation conditions is certainly a very stressful situation for any social animal" (Reinhardt).

The practicability of postoperative pair-housing was demonstrated recently in 15 female long-tailed macaques who were returned to their partners on the day of the operation [placement of vascular access port]. "Change in hierarchy status, self-traumatic events, weight loss or diarrhea did not occur in any of these animals, and the incision sites healed unremarkably. The animals ate and drank normally, and received their postoperative treatments without problem (readily accepted oral medication)." The authors concluded "that this practice of quick return to group status postoperatively can be successfully employed, and it is a `best practice' when working with these laboratory animals".16

"In my form lab, we always paired rhesus macaques prior to surgery (head cap implants) in order to establish a bond. We would then perform the surgery on one animal, keep the partners separated with uninterrupted visual contact for 48 to 72 hours, and finally put them back together. It was beneficial for the animal's recovery and the social partners kept the implant wound margin nice and clean. I remember one of these animals had a serious chronic health problem due to liver malfunction. I am almost certain that the psychological comfort of sharing a cage with a companion helped him cope with the treatments also aided greatly in the recovery process.

Based on my experience, I fully endorse the pair-housing of macaques, especially those who are assigned to surgical procedures that cause a high level of physical discomfort and/or stress. The presence of a companion provides a psychological support that the animals very much need during their post-operative recovery.

The only thing one should be careful of are sutures. Some of the `good' groomers will groom them right out of a wound, so if your animals have sutures it's good advice to wait repairing partners before the sutures have been removed" (Skoumbourdis).

"Your observation surprises me. As clinical vet I had to deal with a large number of pair-housed rhesus who had sutured incisions, for example due to Cesarean sections or laparoscopies. I can say that it was never brought to my attention nor have I witnessed it myself that one partner removed the sutures of the other partner. Were our monkeys more disciplined than yours? But I remember Sissi, a female who was assigned to a study that required premature Cesarean sections. Sissi was paired with Ninni, but it was Sissi herself who stubbornly started two or three days after surgery removing carefully one suture after the other of the long abdominal incision on three occasions. Needless to say that this always complicated the wound healing, so it was finally decided to drop Sissi from this particular study, fortunately" (Reinhardt)!

"How does social-housing affect post-surgical recovery in rodents" (Reinhardt)?

"We have mice who are currently recovering from telemetry-implantation while being housed alone or in pairs. With several years of experience with this surgery, we now are pretty sure that socially housed mice 'feel better' than individually housed mice. Our mice are anesthetized with O2:N2O and isoflurane. They regain consciousness within a few minutes after surgery, are kept in an incubator for one hour and then returned to their group mates in a heating mat-provisioned home cage. We have encountered no problems, and it never happened that group members would bully or remove sutures from the recovering animal. It does, however, occur occasionally that a mouse removes sutures herself. We have recently changed from 'external' stitching to intracutaneous stitching. If you get the hang of it, it's not difficult and does not take more time than external stitching, but precautious removal of sutures is not possible anymore. By the way, in both situations, we used vicryl, so there is no need to remove the sutures afterwards.

I can add here an observation of a colleague, who performs spinal cord surgery in rats. Originally he lost about 20% of the animals when these were individually caged after surgery. Defying tradition, he tried keeping the rats in compatible pairs after surgery. This caused no complications. He then implemented pair-housing for all his post-operative rats. This had the effect that he no longer lost any of his animals. Unfortunately, he has not published this experience and, obviously, does not want to go back to individual-housing to get proper scientific data to support this observation" (Van Loo).

"We had rats assigned to experimental brain surgery and implantation of a gastric fistula. It always amazed me how resilient these animals were. I did not notice a difference related to the animals' post-operative housing conditions. They all recovered very quickly regardless of whether they were alone or housed with companions" (Skoumbourdis).

"Our experience-based discussion suggests that social animals benefit from compatible companionship during post-operative recovery. The traditional practice of keeping animals alone in an unfamiliar environment after surgery increases the subjects' surgery-associated stress. Providing a familiar, compatible companion is likely to alleviate the stress and enhance the post-surgical recovery process" (Reinhardt).

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