

# CONCURRENT VALIDITY AND SKILL DECAY FOR THE LAP MENTOR LAPAROSCOPIC SURGICAL SIMULATOR

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**Introduction:** We hypothesized that the LAP Mentor virtual reality (VR) simulator (figure 1) can improve scores on a video test, which has previously been proven to accurately measure surgical skill, thus establishing concurrent validity. Furthermore, we suspected that a decline in performance would be noted following a one month period without training.

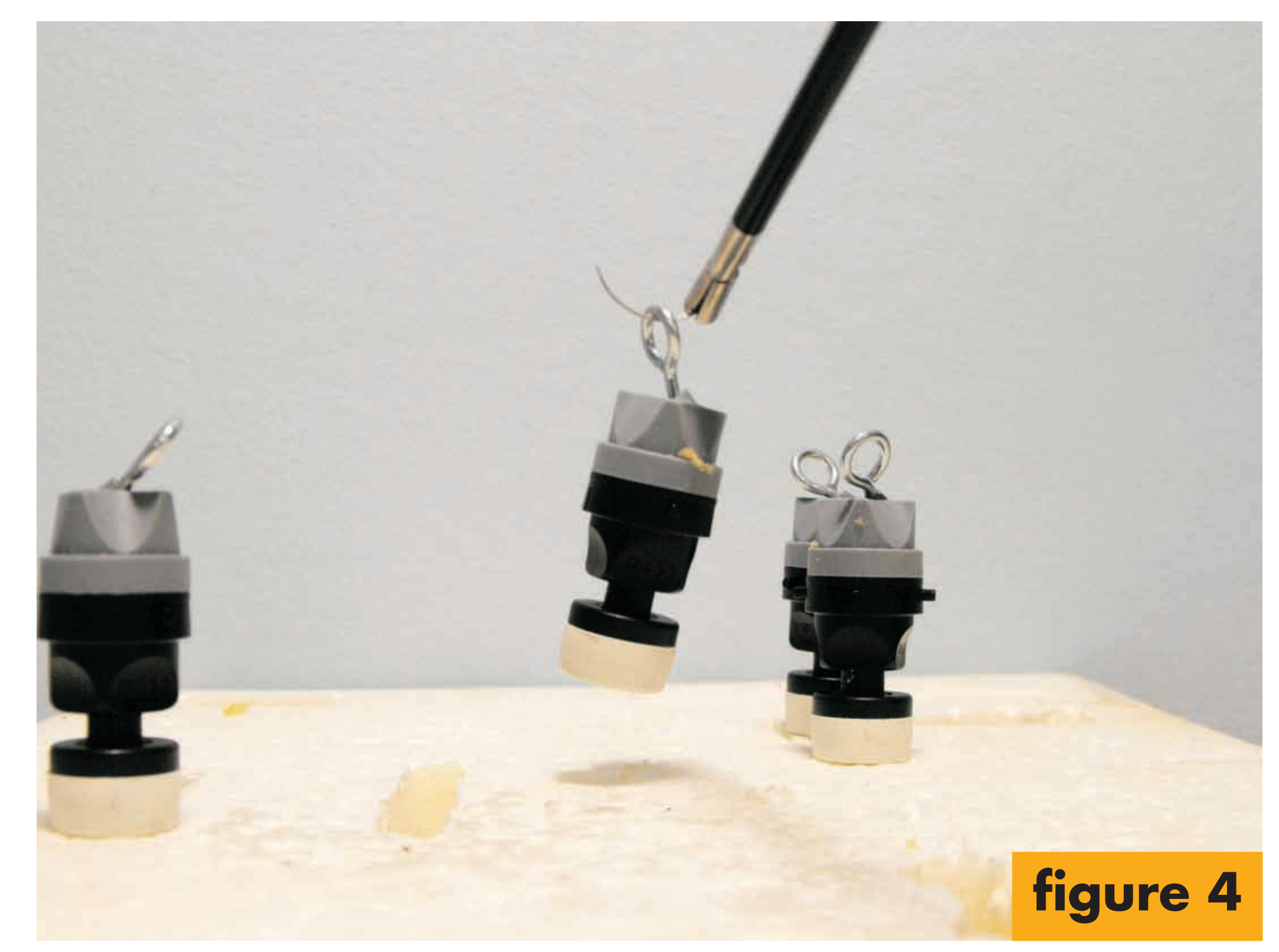
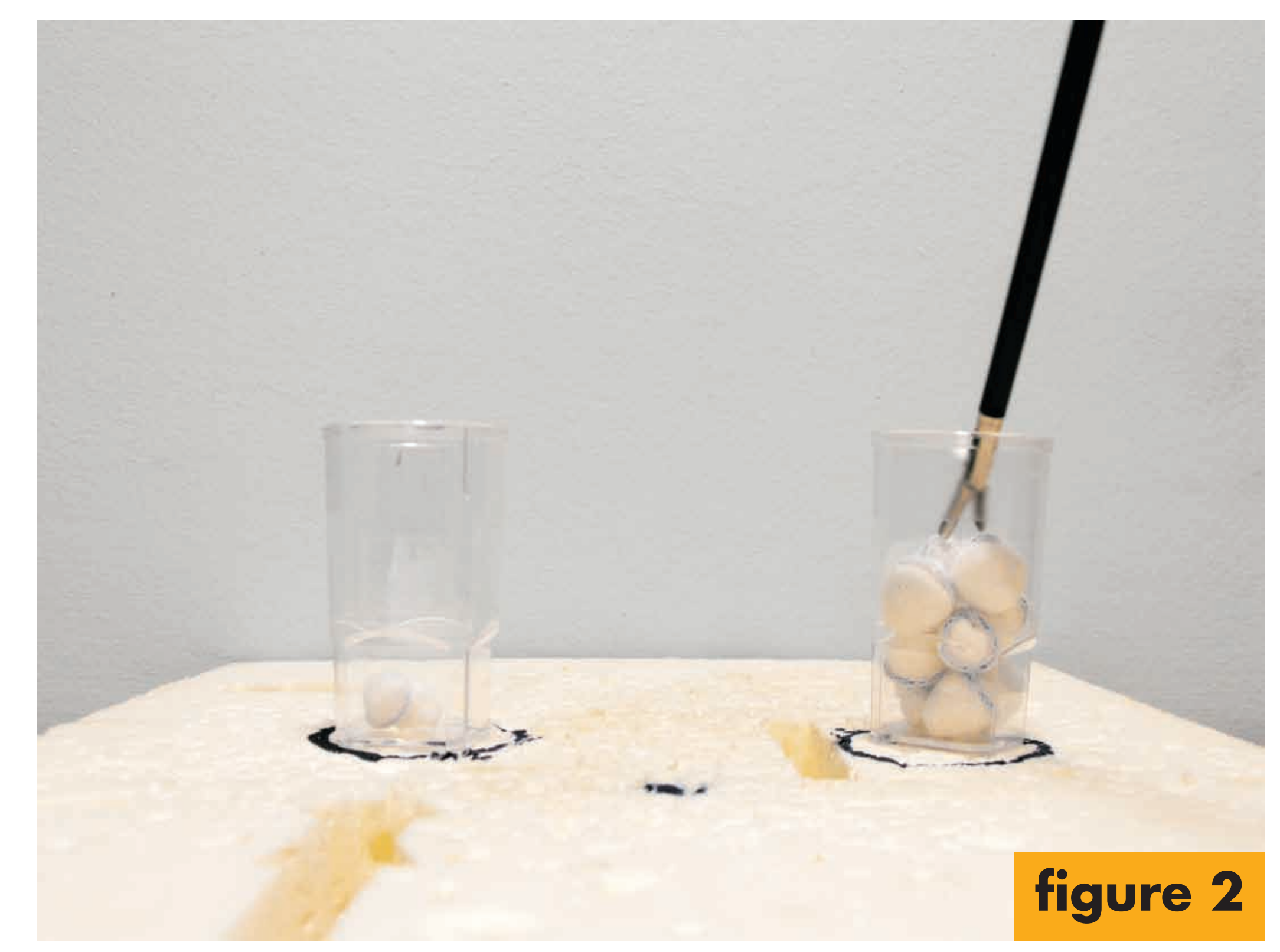
**Methods and Procedures:** We tested 20 medical students interested in becoming surgeons. Each student completed three tasks on a video trainer before training on the VR trainer: bead drop (figure 2), bead transfer (figure 3) and needle pass (figure 4).

Finally, after a 3-4 week absence of training, students completed the video tests for a third time. Completion time and number of errors on the video trainer tasks were compared using analysis of variance.

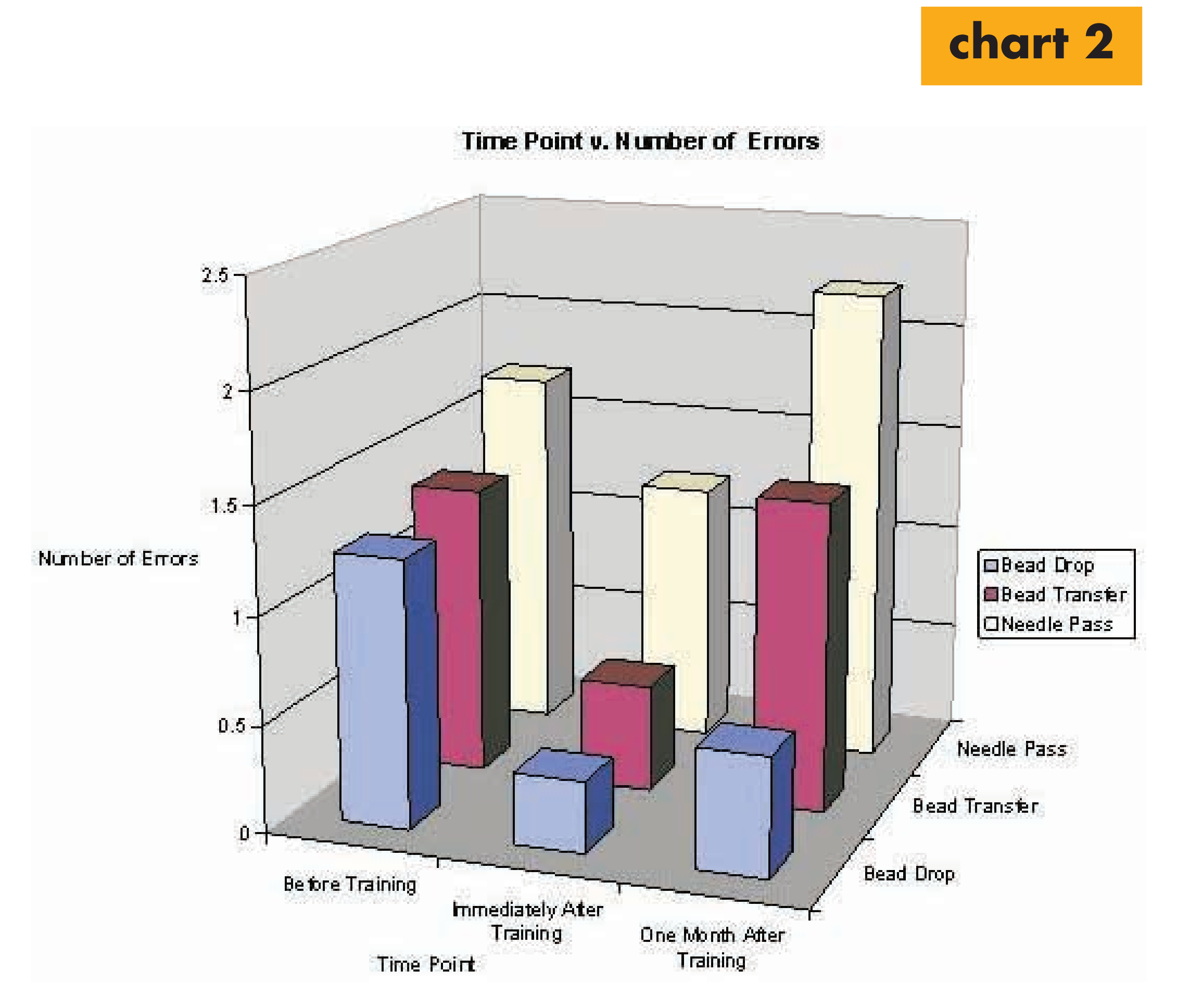
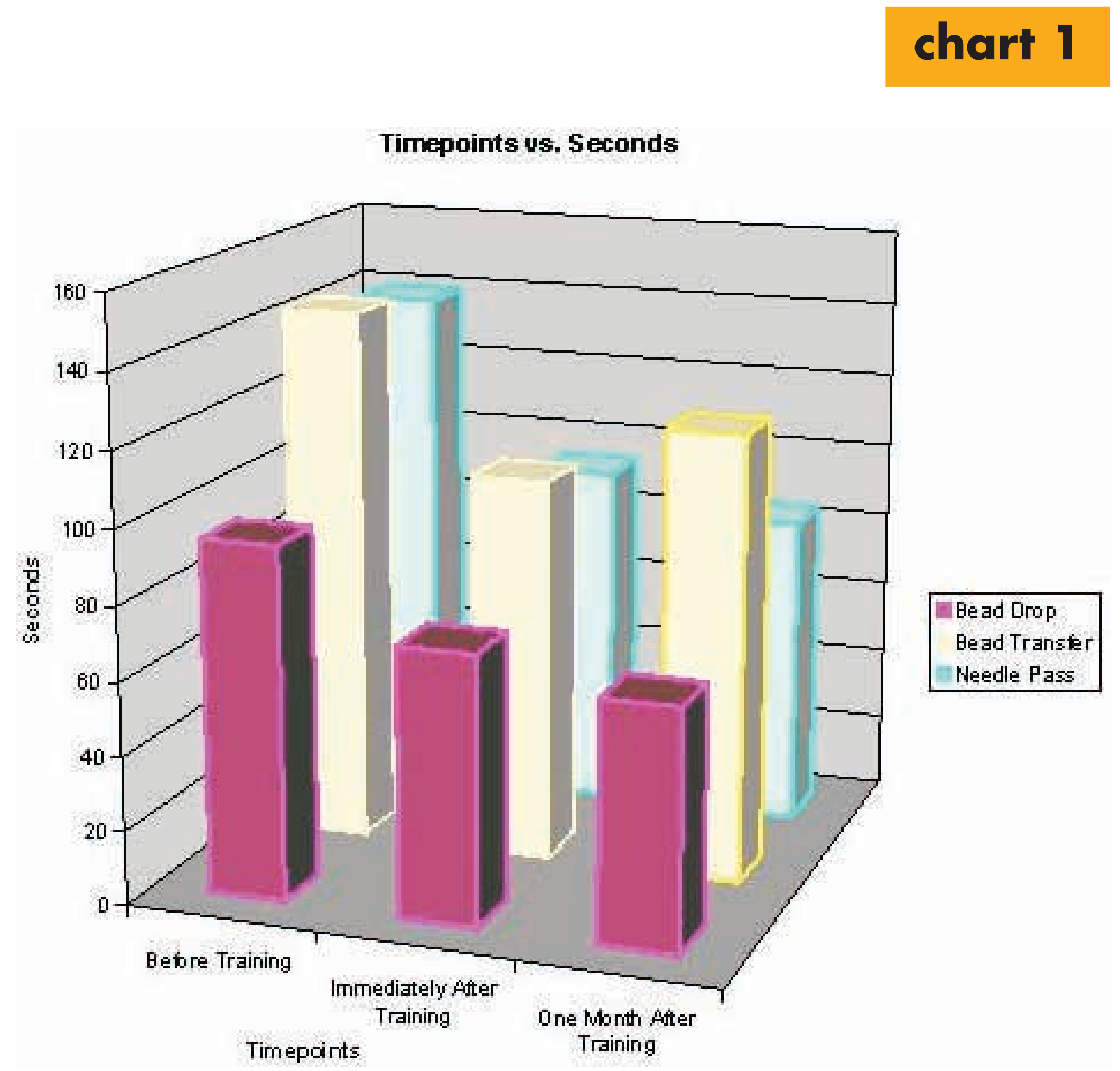
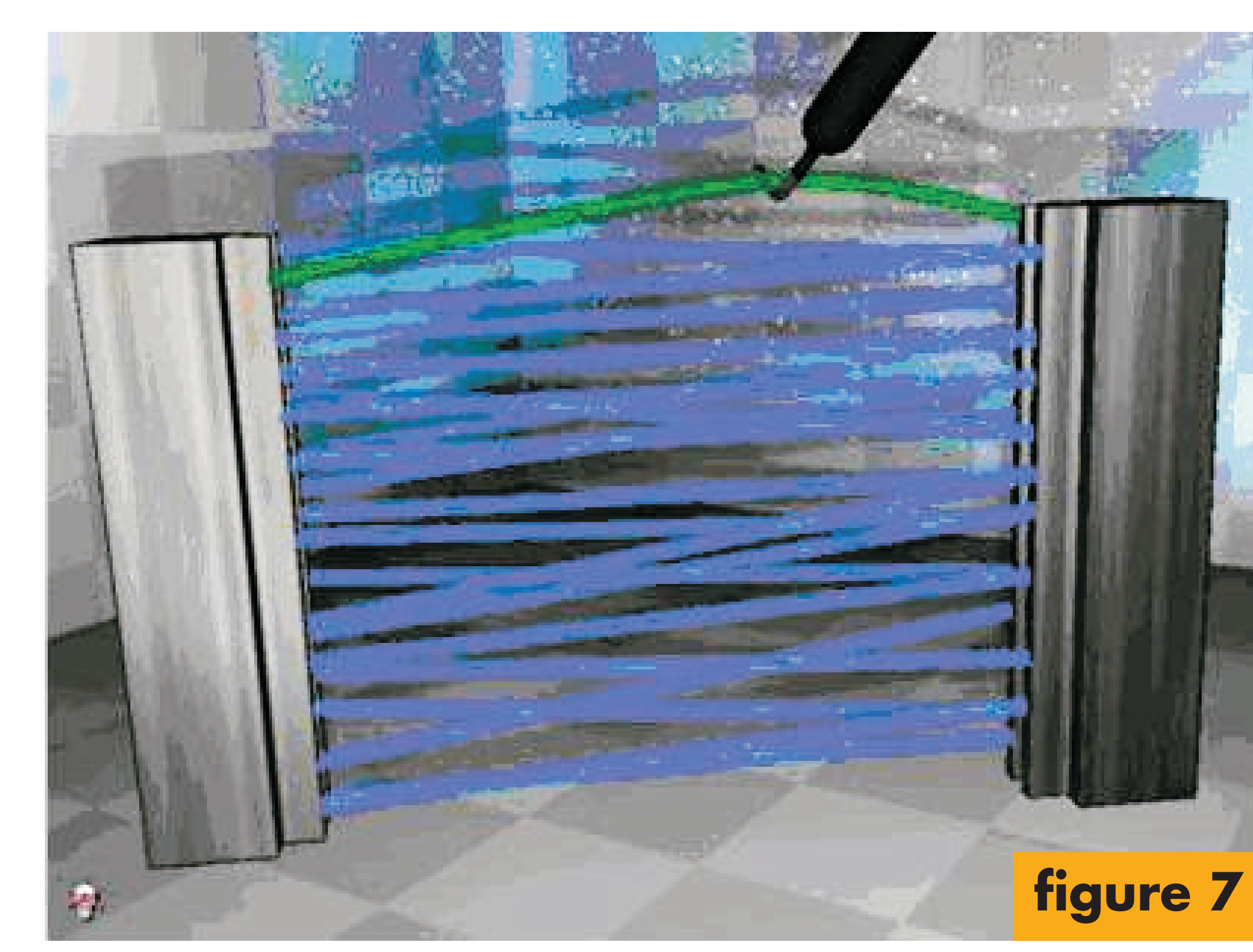
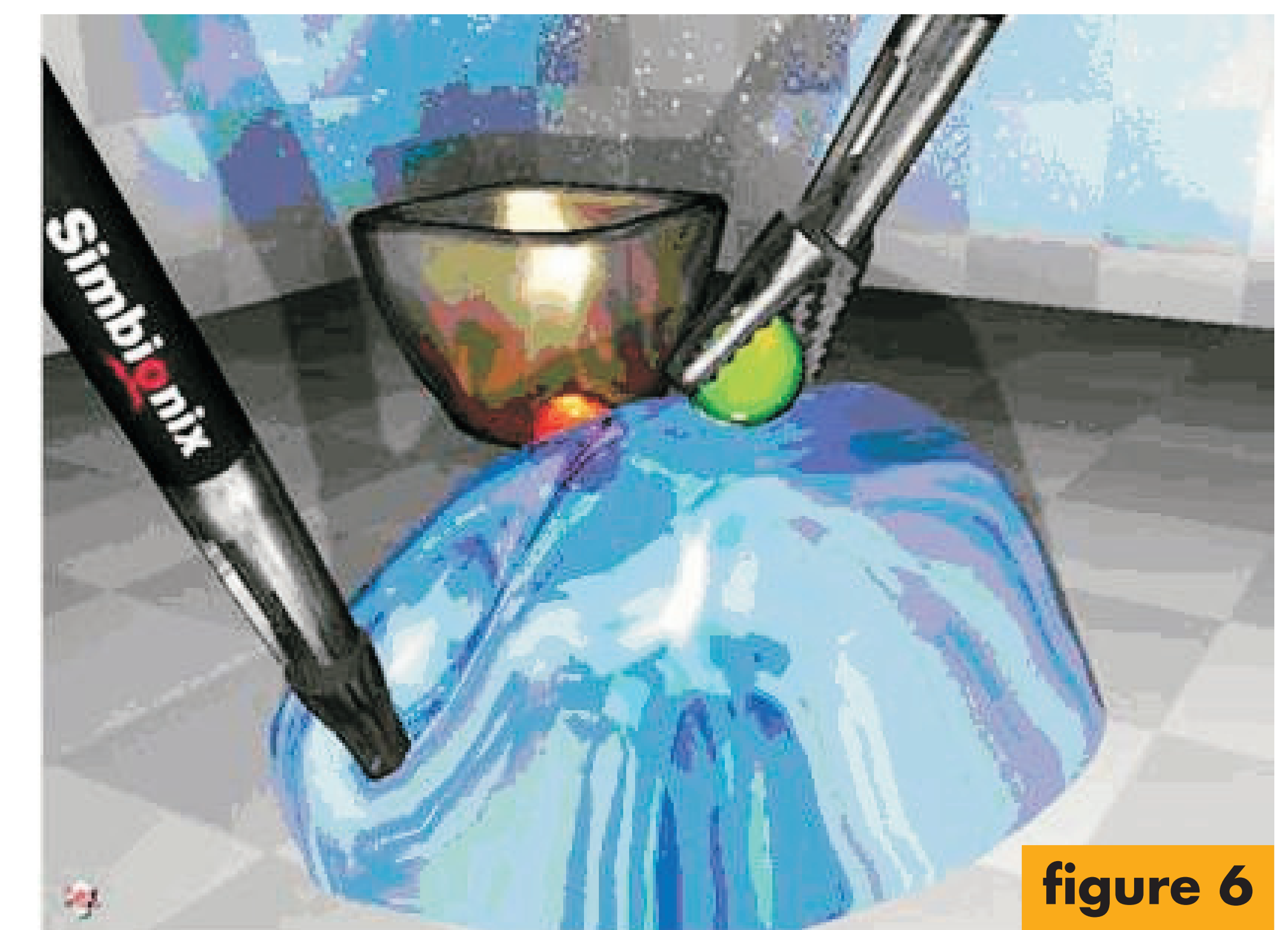
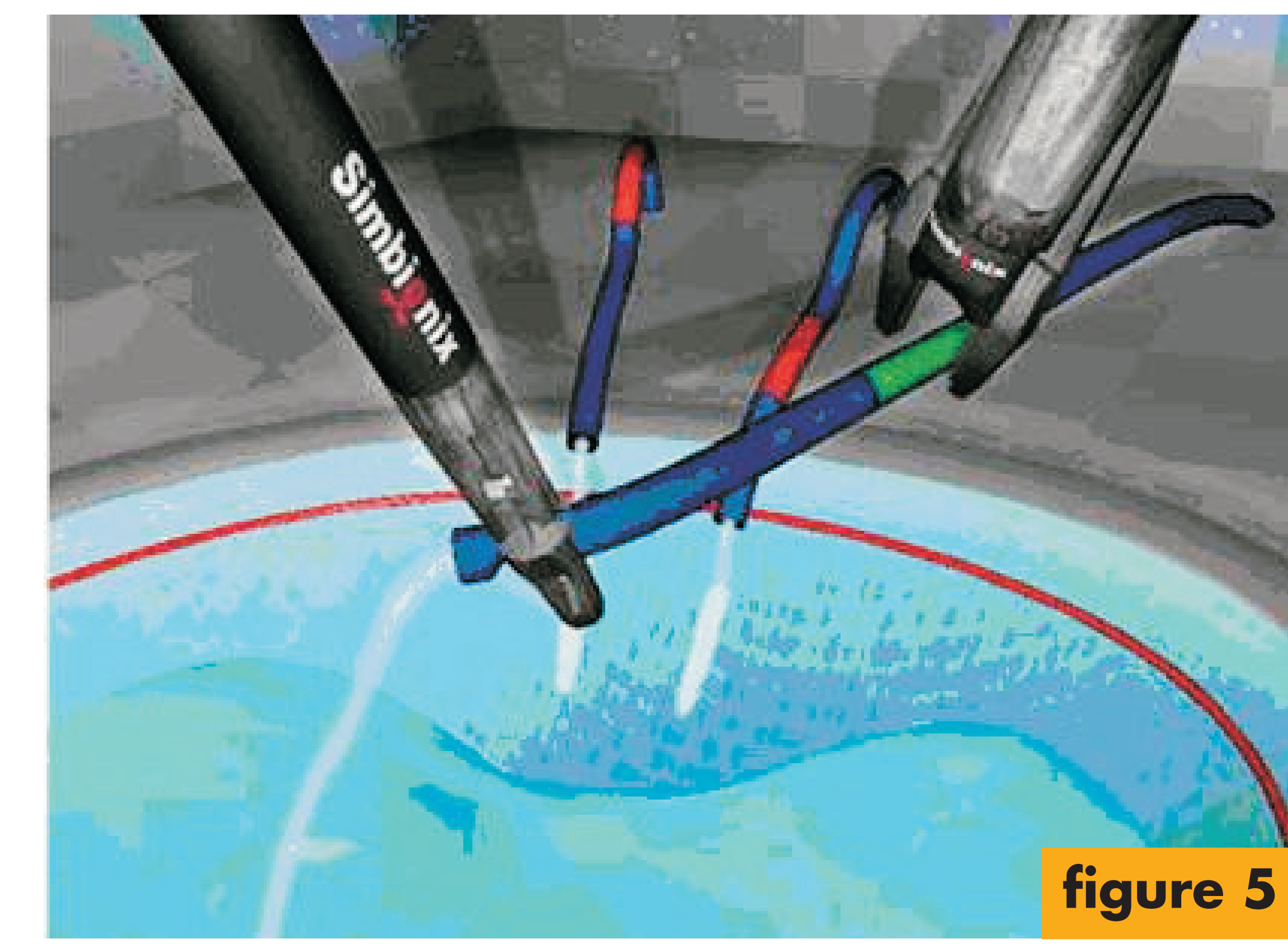
**Results:** A total of 20 students were tested. For all three tasks, completion times significantly decreased after training and maintained this improvement after a one month absence of training (chart 1). Regarding number of errors, for two tasks, there was a significant decrease in errors immediately after training. However for the third task, no significant difference in numbers of errors was found, regardless of training (chart 2).

After an absence of training of one month, there was no significant change in timing of performance (chart 1).

For one of the two improved tasks, the number of errors continued to decrease significantly after an interruption in training, while for the other task, there was an increase in the number of errors after absence of training (chart 2). Overall, virtual training improved video trainer times significantly immediately after training, and they remained so a month later. The differences in numbers of errors amongst tasks before and after absence of training varied according to each task.



Students then completed the three tasks again immediately after completing the VR basic skills training program. The VR training consisted of the following tasks: clipping and grasping (figure 5), two-handed maneuvers (figure 6), and electrocautery (figure 7).



**Conclusions:** The LAP Mentor basic skills module has concurrent validity. Completion of the LAP Mentor training protocol improved completion times and number of errors on the video trainer, which correlates with improved surgical skill. After an interruption of training for one month, completion times generally remained improved as compared to the initial scores, but did not significantly increase or decrease from the scores achieved immediately after training. Thus, LAP Mentor training provided a lasting improvement in skill. The results regarding number of errors cannot be generalized among the three tasks, demonstrating that errors are a more task-specific measurement than completion time. The effects of longer-term interruptions in training may be examined in future studies.