Purpose:
It is well known that mass practice results in inferior performance compared to distributed practice in terms of cognitive and psychomotor learning. While it is clear that break periods are desirable, it is unclear what learners should do during these breaks. Some educators recommend that learners should abstain from all task-related practice; however, it is possible that switching to an alternate exercise during break periods can also be effective.

A construct in cognitive psychology known as proactive interference (PI) posits that new learning is disrupted by prior learning. PI can be “released” when the nature of the target task is changed after several practice trials. This effect is often replicated in laboratory settings by asking learners to recall items in a list. When the list contains only consonants, participants recall a limited number of items. However, when the list presents a series of consonants followed by a series of numbers, participants recall significantly more list items, with recall reverting to being almost perfect after switching from consonants to numbers. Controversy exists as to whether PI also impacts motor learning.

In this study, we examined the existence of PI in motor learning under five training conditions that differed in terms of contrast to a target exercise.

Methods:
Laparoscopic novices (75 preclinical medical students) performed one trial of peg transfer as a pretest. Participants were then randomly assigned to training conditions: Mass practice (n=15), similar exercise (laparoscopic bean transfer, n=15), dissimilar exercise (open suturing, n=15), observation (watching an expert, n=15), or rest (watching unrelated videos, n=15). Participants in the mass practice condition practiced peg transfer in three training blocks of 15 minutes, each separated by a 5 minute break. Participants in the other conditions performed three 30-minute training blocks consisting of 15 minutes of peg transfer followed by 15 minutes of the alternate exercise (observation was in 10 and 5 minute blocks). After the three training blocks were completed, participants performed one additional peg transfer trial as a posttest.

Results:
Analysis of Covariance on posttest scores using pretest scores as the covariate indicated a significant main effect for training condition (p=.009). Trainees engaging in mass practice performed significantly worse than participants in the dissimilar (p=.012), observation (p=.022), and rest (p<.001) conditions. Additionally, trainees in the similar exercise condition performed worse than participants in the rest condition (p=.03).

Conclusions:
Mass practice resulted in significantly worse performance than practice on a dissimilar exercise, observation, and rest. When learning a laparoscopic task, a break comprised of dissimilar practice or unrelated activities is effective in releasing PI and improving performance.