Comparison of screen based simulation versus problem based discussion for teaching in Neuro-anesthesia during residency

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METHODS
This was a randomized trial conducted between September of 2011 and March 2013 at the Cleveland Clinic. We received prior approval from the institutional review board of the Cleveland Clinic to conduct the study and written informed consent from the trainees participating in the study. The anesthesiology residents undergoing neuroanesthesia rotation for the first time at the CA-2 level were eligible to participate in the study.

The neuro-anesthesia rotation occurs during the CA-2 year and only residents who were to undergo their first neuro-anesthesia rotation of their residency were eligible for the study.

Prior to the start of the neuro-anesthesia rotation (4 weeks), they took a multiple choice question test on the two cases.

Case A Venous air embolism in a patient undergoing surgery for posterior fossa tumor

Case B Anesthesia for raised intracranial tension in a patient coming for neuro surgery.

Primary outcomes:
Short-term retention: the absolute difference in the test scores (score improvement, calculated as post minus pre) between prior to and shortly after the training session on written examination for each training method.
Long-term retention: the absolute difference in the test scores (score improvement, calculated as post minus pre) between prior to and eight weeks after the training session on written examination for each training method.

Secondary outcome
Resident satisfaction measured based on a 10-question survey with 5-point Likert's scale framed as attitudes toward simulation training.

RESULTS
Twenty residents participated in the study. Raw score improvements in the on-screen baseline were not different in short and long term for each of the training methods. Resident's satisfaction for simulation is shown on a Likert scale in Table 1. P value < 0.05 was considered statistically significant.

Table 1: Summary of the raw derived scores for short-term and long-term retention for the simulation and PBLD training methods, given on written examination (N = 20).

<table>
<thead>
<tr>
<th>Method</th>
<th>Short-term retention</th>
<th>Long-term retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-score</td>
<td>Post-score</td>
<td>Post-score</td>
</tr>
<tr>
<td>Simulation</td>
<td>101.9 ± 1.2</td>
<td>111.9 ± 1.8</td>
</tr>
<tr>
<td>PBLD</td>
<td>101.4 ± 1.2</td>
<td>111.8 ± 1.8</td>
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</tbody>
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CONCLUSIONS
We hypothesized that teaching through computer simulated scenarios are as effective as the standard PBLD scenario, and if that hypothesis proves sound, we will be able to provide extra educational scenarios in the form of a game and time suitable for an individual resident rotating through neuro-anesthesia.

DISCUSSION
Current anesthesiology residencies must ensure that trainees progress through training acquiring and retaining knowledge in all the specialty areas which will enable them to perform well in their written boards. Our study investigated whether a screen based simulator could be used as an additional educational method in neuro-anesthesia and could lead to score improvements on multiple choice questions. We feel that these score improvements could translate into better scores in the written AKT and ITE exams as well. Our results support the contention that screen based simulators are good devices to acquire technical skills of crisis management. Mannequin simulators would probably provide better training for behavioral aspects of crisis management, such as communication, leadership, and interpersonal conflicts.

CONCLUSIONS
Simulation and traditional training methods did not differ in the short or long term mean score improvement.

• There were no records on the order of the training sessions. Therefore, we were not able to account for possible training order effect on the relationship between educational methods and the outcomes.
• The resident satisfaction on the traditional training method was not recorded; therefore, we were not able to compare the educational methods based on the resident attitude.

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