

# Impact of learner's role (active participant-observer or observer only) on learning outcomes during high-fidelity simulation sessions in anaesthesia: single centre, prospective and randomised study.

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### Introduction and Aims

High-fidelity simulation has recently been implemented in France in the Anaesthesia training curriculum. However, due to an increasing imbalance between the growing number of students and the human resources available, all residents cannot play a role during scenarios. The study objective was to assess the impact of learner's role (active participant-observer or observer only) on learning outcomes immediately after high-fidelity simulation and the 3-month retention of knowledge.



### Methods

This prospective randomised study was conducted at LabForSIMS (Paris Sud University) simulation centre. All third to fourth-year anaesthesia residents of Paris were invited to attend a one-day training session which included 4 different scenarios using a high-fidelity mannequin. During each scenario, 3 residents played an active role while others observed the scenario in a separate room using direct video-retransmission. All residents participated to the common debriefing which was delivered after each scenario. After obtaining consent to study participation, the residents were randomised between active participant-observer group (active participant during one scenario and observer of the 3 others) (AP-O group) or observer group (observer during all the 4 scenarios) (O group). A similar questionnaire was recorded immediately after the session and at 3 months and included self-reported evaluation of satisfaction, medical knowledge (noted 0-16), non-technical skills and perceived transfer of learning using 1 to 10 Likert scales (Kirkpatrick level 1, 2 and 3 respectively). Data are expressed as medians [interquartile range] and analysed using a Wilcoxon test. A p value < 0.05 was considered statistically significant.



### Results

107 anaesthesia residents were included and 104 questionnaires analysed. Satisfaction regarding the training session was high in both groups but higher in the AP-O group (9 (8-9) vs 8 (8-9) /10, p = 0.019). A significant increase in medical knowledge scores was recorded in both groups immediately after simulation with a higher score in the AP-O group (median score: before: 6 (5-8) vs 7 (5-8) /16, p=0.382, and after: 10 (8-11) vs 9 (7-10) / 16, in AP-O and O groups respectively, p=0.001, Fig 1). High scores for non-technical skills and learning transfer were observed after the session, without any difference between the two groups (p > 0.05). Retention of knowledge was difficult to interpret because of limited participation (48%).

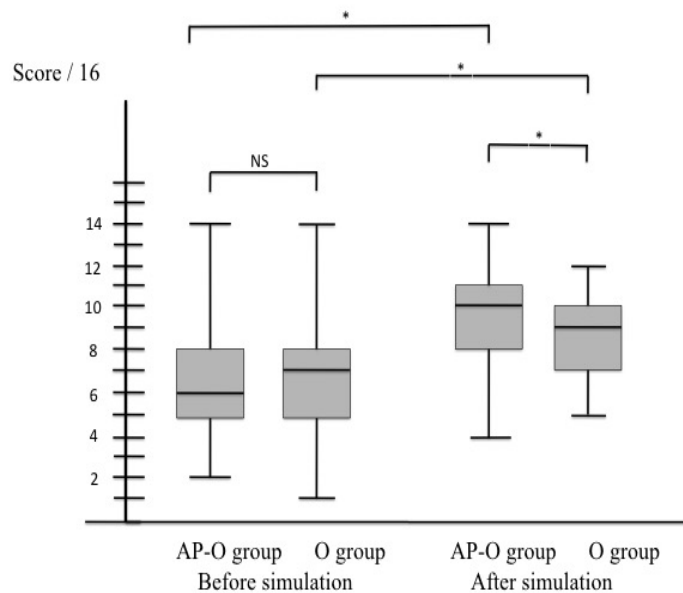


Figure 1: Comparison of medical knowledge scores between AP-O group and O group before and immediately after simulation training (\* if p<0.05).



### Discussion

This study suggests an immediate improvement of learning outcomes for both roles after immersive simulation but some learning outcomes may be better for residents engaged as players in scenarios.

Keywords : Simulation – Anaesthesia training– observer role- learning