Implementation of a novel synchronous multi-site all day high-fidelity simulation

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Abstract
Integration of simulation in educational curricula for anesthesia and intensive care residents is a hot topic. There is a great interest for simulation centers to share their experiences through multi-site synchronous simulation sessions. The present study results from an experience conducted at three sites in France (Paris, Lyon, and Caen), which involved 16 instructors and 25 residents facing the same scenario across 1 day. Synchronous simulations were performed at each site with local and shared debriefing via teleconference. This innovative approach to simulation was found to be feasible, although certain difficulties were encountered with connectivity.

Keywords: High-fidelity simulation training

Introduction
There is a growing willingness, both nationally and internationally, for simulation program implementation in curricula of anesthesia and intensive care residents. This is associated with effectiveness in improving performance, patient outcomes, and team management [1–3]. Clear recommendations for the implementation of a simulation program, including financial, human resources, pedagogical, deontological and quality management demands, and infrastructure and equipment requirements, have been published in 2012 by the French health authorities [4]. These have been used by simulation centers across the country, and it is now of interest to share their experiences through a multi-site synchronous simulation session. Shared tele-debriefing using videoconferencing technology was adapted, as has been reported for high-fidelity simulation (HFS) [5]. Although simultaneous simulation sessions between a center performing HFS and a center visualizing it simultaneously for a shared debriefing, or between two centers performing HFS alternatively with a shared trans-Atlantic debriefing [6] have been reported, synchronous multicenter simulation over a whole day has yet to be described.

Method
This multi-site multi-modality simulation was performed on April 11, 2017, in France between Lyon (CLESS, Université Claude Bernard Lyon 1), Caen (NorSimS Simulation center, Caen University Hospital), and Paris (Ilumens Simulation Department, Sorbonne Paris Cité University).

Twenty-five anesthesiology and intensive care medicine participated in the session requiring 16 instructors and 3 technicians. All residents participated on a voluntary basis. The simulation was organized by all three centers with the support of the French Society in Anesthesia and Intensive Care Medicine (SFAR) youth committee.

Among the Internet protocol-based teleconference software available, such as Polycom™, Skype™, or GoTo Meeting™, we selected the latter since it provides better quality audio and video. Each center had a broadband internet connection, and the connectivity was tested the day prior to the simulation session by center technicians. During the trial session, a full-scale test of all connections and equipment, using exactly the same materials that were to be used during the experience, was performed. The three centers had already standardized the HFS timeline following the French health authority recommendations [4]. This consisted of a first general...
This synchronous one-day multi-site simulation was found to be feasible. Furthermore, sharing debriefing
with other centers provided insightful comments and thoughts on simulated scenarios. This approach may also become a valuable tool for simulation centers to benefit from the experience of external experts in specific fields of critical care. However, there were certain aspects that require attention in the future, most notably the quality of the videoconference which was suboptimal and impeded the participation of all centers on two occasions. This may be related to the use of free internet teleconference software, and therefore, it may be of interest to consider using professional services for future sessions.

Informal feedback from the residents was very positive, and all were willing to participate in this kind of workshop in the future. The response rate to our survey was low and likely impacted by the 1-week delay in collection.

This collaborative work paves the way for simulation centers to start sharing with others their experiences, expertise, scenarios, resources, and research projects. Such networking between French simulation centers may be extended to an international network and could promote exchanges in terms of practice and organizational skills between different countries. Cooperation, with sharing of human and material resources for a common project, may benefit the present and future generations of intensive care and anesthesiology caregivers thanks to improved simulation-based learning sessions.

Abbreviation
HFS: High fidelity simulation

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PA and FV drafted the manuscript. ML designed the manuscript and made critical revisions for important intellectual content. AT and CB made critical revisions. All authors read and approved the final manuscript.

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