

Simulation for airway management in a critical care set up

Editorial

Airway management remains challenging for any anesthesiologists. It becomes more challenging in a critically ill patient. The essential component of successful airway management requires specialized technical and nontechnical skills along with sound background knowledge and higher-order cognitive skills and behaviors (Figure 1).^{1,2} The traditional form of airway management learning has shown a drift from lecture based teaching to mannequins and handling of equipment in the past. These may be considered only for basic training as these remain static and do not provide clinical feedback of real time situations. There was further change to video based and interactive sessions along with acquisition of skills on mannequins.^{3,4} These may be considered only for basic training as these remain static and do not provide clinical feedback of real time situations. But recently with advancement in technology, simulator based learning has emerged as an important tool for airway management.^{5,6}

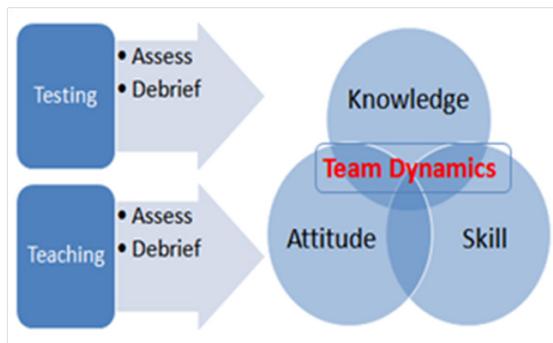


Figure 1 Ingredients of airway simulation.

The simulators have been used conventionally by pilot training wherein real time scenario and crisis situation is created for management. Similar concept has been recently extended in medical sciences for teaching and training and has found an important role in airway management as well. Simulators are inevitable for learning the technical skills and aids in learning and assessing psychomotor tasks, cognitive and affective skills.^{1,3,4,7,8} Simulation practice ensures team dynamics along with application of algorithmic approach for holistic management. Traditionally airway management training was delivered by practicing skills like laryngoscopy, fiberoptic tracheal intubation individually. In real scenario, these individuals' skills need to be choreographed into a systematic approach. We need to have primary approach for airway management, secondary approach, if it fails and also subsequent rescue approaches. This real time airway management may not be possible in airway trainers by learning individual skills. The algorithms have been proposed by various professional bodies for management of airway.¹ The simulators would help to acquire the skills and judgment of the equipments and techniques required of the algorithm.¹ The simulators in airway management helps in improving psychomotor level (skill training),

cognitive level (decision making) or affective level (interacting with peers/coworkers)¹ The simulators are an important tool for evaluation of efficacy of training and skill retention.^{1,2,9} In view of ethical concerns and patient safety, simulator training would become essential prior to interacting with real patients as compared to training on real patients. The simulator available are either partial-task or whole-task trainers or may replicate real time conditions without compromising the patient safety.¹ Though the animal models were initially used for these concerns, but many aspects of real time situations were not feasible in such models.¹ The high-fidelity patient simulation reproduce real-life patient and a similar environment may be created as to be encountered by the learners. Such environment may be considered as sensitizer for the learners for real time stressful situations to handle difficult airway situations in critically ill patient. Unlike real patients, a high-fidelity airway simulator provides various opportunities for different type of airway difficulties and complications. This provides learners an opportunity to perform multiple times under different conditions.

The steps related to airway simulation training in a critical care set up are:

- Objective of the simulation: This should be decided prior to start of simulation based on the need of the participants. It should be objectively mentioned and goals ascertained. The level of learning may also be objectively decided.
- Simulation scenario: Creation and designing: As per the requirement, the scenario needs to be prepared that covers the objective of the airway simulation in the initial step. The scenario should include options/alternatives for management and may be algorithm based which may have been introduced to the participants prior to act. The scenario should decipher the role of each members of the team and evaluation sheet for the trainer as well. The trainer should be well versed with the various flows of the scenario related to airway management and thus required equipments and other accessories also needs to be arranged.

Volume 4 Issue 4 - 2016

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Received: January 21, 2016 | **Published:** February 20, 2016

- c. Simulation performance: This is the real act after the stage is set for airway management. The various steps should be predicted by the trainer and positive and constructive inputs and guidance provided through the act. The participants are made aware of the simulation environment and then continued with the simulation drill. The requisite of such simulation is recording of the events that were the initial objectives.
- d. Debriefing and evaluation: This process involves critical appraisal of the simulation keeping in mind the initial objective. This may require a flow chart or video recording based discussion. This should be done in positive and constructive manner and trainer should conduct debrief in a team-building atmosphere.

The presence of trained team improves the success of airway management. The team dynamics needs to be learnt and simulation provides team practice as well. The simulation in airway requires basic elements of team dynamics including clear communication and understanding among team members. The role and responsibilities needs to be clarified and practiced. Team members needs to practice and share their knowledge and expertise in respectful environment. The advantage of expertise of particular skill by an particular individual needs to be kept at advantage or in other words the limitation of the members needs to be appropriately tackled. These all team dynamics elements can be practices on simulation bases airway learning.

The learning of specific training skills like surgical airway, laryngoscopy, fiberscopy or supraglottic airway device placement is important. But its correct selection, its use in specific situations in a timely manner with appropriate team dynamics is also essential for successful patient outcome.⁴ It remains to be emphasizing airway learning in critical care set up should follow an holistic approach and based on situations and resources available and should be comprise of knowledge acquisition, skill practice and simulation scenario based practice.¹⁰

Acknowledgments

None.

Conflicts of interest

Author declare that there is no conflict of interest.

Funding

None.

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