

“Airway Management Education in Swiss Anaesthetic Centres: Hôpitaux Universitaires de Genève, HUG”

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Introduction

Airway management (AWM) skills are essential for anaesthesia practice and expertise. However, an important paradox needs to be highlighted: on the one hand we are often considered the “airway experts” but on the other hand problems related to AWM remain a leading cause of anaesthesia related morbidity and mortality.

It has indeed been repeatedly reported that incorrect clinical practice and poor management skills often worsen the severity of AWM difficulties and contribute to patient morbidity and mortality. Lack of knowledge, education and training contributes to these complications in up to 50% of the cases. In addition, poor communication and poor teamwork contribute to poor outcome whereas good communication and teamwork favour better outcome in difficult AWM. AWM education, training and maintenance of competences among anaesthesia practitioners is therefore of crucial importance to patient care and patient safety.

Current challenges in AWM training

In order to provide the best AWM education and training program, we must be aware of the various challenges and barriers that educators and learners are currently facing. The most obvious one are briefly presented here:

- Time, practice and acquisition of expertise: Trainees need sufficient time and practice to acquire AWM skills. Previous studies have reported that up to 50 attempts at routine (easy) direct laryngoscopy are necessary in order to achieve a 90% endotracheal intubation (ETI) success rate. Interestingly, a significant proportion of trainee will require assistance for a much longer period even for routine ETI. It is more than obvious that mastering of difficult airway situations will require even more training.
- Learning opportunities in clinical practice are decreasing: opportunities to practice AWM are variable for anaesthesia residents and caseload per trainee tend to decrease. This is in part due to the introduction of working hour limitations, increase in the number of trainees, and also in part due to some changes in practice, e.g., less tracheal intubation in obstetrics, increasing use of supra-glottic airways, less fiberoptic guided intubation, ...
- Clinical training is unpredictable: Trainees' clinical exposure to routine and difficult airway cases are highly unpredictable, heterogeneous and often insufficient

particularly in emergency situations. Residents achievement of educational objectives has been reported to be very low for some complex airway skills (e.g. fiberoptic intubation or cricothyroidotomy).

- Technical skills are essential in AWM but they must be backed up and complemented by appropriate clinical judgment, decision making, situation awareness, communication and teamworking skills. These so called "Non-Technical Skills" (NTS) are often ignored or insufficiently taught both in general, during residency training and continuing education, and in particular during specific AWM training.

Considering all these challenges and considering the limitations of traditional clinical training, non-clinical training modalities such as part task trainers, virtual simulation, and high fidelity mannequins have become necessary and must be integrated in AWM training and education program.

What do we teach at the HUG?

During the lecture I will detail the overall content of AWM education program during anaesthesia residency training at the HUG. The following Table summarizes the learning objectives in terms of knowledge, technical skills, clinical guidelines and non-technical skills that are included in our residency program.

Core AWM skills	Basic knowledge and Institutional Clinical Guidelines	Non-technical skills (NTS)
<ul style="list-style-type: none"> • Airway evaluation • Pre-oxygenation techniques • Face mask ventilation • Direct laryngoscopy • Two type of extraglottic devices • Two alternative technique a for ETI: ILMA + video laryngoscope (non-channelled + channelled) • Awake fiberoptic intubation • Rescue techniques for oxygenation: Ventrain + needle/scalpel crico • Basic extubation techniques 	<ul style="list-style-type: none"> • Airway anatomy • Paediatric, ENT and OB specificities <p><i>Institutional guidelines:</i></p> <ul style="list-style-type: none"> • Rapid sequence intubation • Unanticipated difficult intubation • Endotracheal extubation • Reversal of neuromuscal blocking agents 	<p>Generic NTS (based on ANTS scale) Prevention of fixation errors Practical tips: "Stop and think", "Declare failure", "Call for help", "SBAR", ... Interprofessional training</p> <p>Teaching occur during clinical scenarios focused on:</p> <ul style="list-style-type: none"> • Gastric regurgitation • Cannot intubate can ventilate • cannot intubate cannot oxygenate • Extubation at risk

How do we teach AWM at the HUG?

During the lecture I will present the overall organization of the AWM education program during residency training at the HUG. I will describe important aspects such as chronology of training, clinical supervision, clinical rotations and non-clinical training methods and resources used during structured teaching of AWM during anaesthesia residency at the HUG.

A special emphasis will be put on the description of the use of part-task trainers, virtual simulators and high fidelity mannequin simulation in our AWM education program during anaesthesia residency training at the HUG.

Weaknesses and future challenges

Overall the current organisation of AWM training at our institution allows our trainees to achieve the competences described in the Swiss catalogues of Learning Objectives in Anaesthesia reanimation. Nevertheless, we are fully aware that there is room for improvement in particular in the following areas:

- Documentation of the trainees' performances as well as regular constructive feedback on trainee' performances by clinical supervisors during work-based evaluation must be reinforced. To achieve this goals, we are currently developing an ePortfolio/logbook that will be based on the concept of "Entrustable Professional Activities" (EPAs). (REF)
- Increasing use of Videolaryngoscopy at a very early stage when trainees are learning the skills of tracheal intubation and direct laryngoscopy. Studies have shown a more rapid acquisition of intubation skills when a conventional geometry videolaryngoscope is used initially. Currently this is not a routine practice at our institution partly due to limited availabilities of adequate material in our numerous operating rooms and also partly due to the strong belief among supervisors that direct laryngoscopy is a core skill that must be mastered prior to any other techniques.
- Interprofessional education is essential to reinforce and improve NTS. Although interprofessional training exists at our institution it is still marginal both in term of intensity and scope. Our current sessions only include anaesthesia residents and anaesthesia nurses, and occur only two-three times during the whole residency program. Efforts should be made to increase both the numbers of these sessions and to widen the audience to other health care professionals who often collaborate with the anaesthesia providers during AWM in various setting: emergency room, radiology or endoscopy suite, out-of hospitals setting, etc...
- Finally, we currently do not offer a specific "advanced clinical airway rotation" or "Fellowship in AWM". This is something we may consider in the future since it would

offer important opportunities for some trainees to further develop their clinical, educational and research skills the field. This should contribute to the improvement of AWM practice and education at our institution.

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