

# Intubation practice patterns in Tuscan emergency departments

Leon D. Sanchez · Paolo Di Martino ·  
Matthew Babineau · Michele Lanigra · Kevin M. Ban

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## Abstract

**Introduction** Intubation is one of the most important life-saving procedures performed by emergency physicians (EPs). There is variation in practice when different countries are compared.

**Methods** A written questionnaire on intubation practices was administered to a group of Italian doctors practicing in Tuscany during the examination period of a year-long course in emergency medicine.

**Results** The survey was administered to 153 participants. Of these, 143 (93.4%) returned a complete survey. In the sub-group of physicians who work in the emergency department (ED), 73.6% report intubating patients. Of those that intubate patients, 92.3% use some sort of sedation, and 49.3% use paralytics. While direct visualization of the cords for intubation and auscultation of breath sounds after intubation are almost universal (97% and 100%, respectively), only 11.9% use colorimetric CO<sub>2</sub> detectors for confirmation of intubation. After intubation 58.2% commonly place a nasogastric tube and 50.7% obtain a post intubation chest radiograph.

**Conclusions** Practice patterns in the USA and Tuscany are different. RSI and post-intubation radiographs are the standard of care in EDs in the USA. This is not the case in Tuscany.

**Keywords** Airway · Intubation · Emergency medicine

## Introduction

Emergency medicine (EM) is an established specialty in the USA. Intubation is one of the most important life-saving procedures performed by emergency physicians (EPs) and is considered a defining skill of the specialty [1]. After years of standardized residency training in EM, intubation practice in the USA has become uniform with rapid sequence intubation (RSI) representing the widely accepted standard of care. In other countries where EM is at an earlier stage in its professional development, larger practice variations in airway management may exist.

The Tuscan Emergency Medicine Initiative is a comprehensive program initiated in 2003 to create a sustainable emergency medicine (EM) training and qualification process in Tuscany, Italy. The program is a collaboration among the Tuscan Ministry of Health, the Universities of Florence, Pisa and Siena, the Harvard Medical Faculty Physicians at Beth Israel Deaconess Medical Center and Harvard Medical International. The program has the goal of training several hundred practicing EPs. At the inception of the program there was no official recognition of EM as a primary training specialty.

The qualification course for practicing EPs is a 12-month part-time course. Physicians need a minimum of 3 years of work in the emergency department (ED) or 5 years in the prehospital system to be eligible to participate in this course. Successful course completion leads to physician

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L. D. Sanchez (✉) · M. Babineau · K. M. Ban  
Department of Emergency Medicine,  
Beth Israel Deaconess Medical Center,  
One Deaconess Road WCC-2,  
Boston, MA 02215, USA  
e-mail: Leon\_sanchez@bidmc.harvard.edu

P. Di Martino  
Tuscan Emergency Medicine Initiative,  
Tuscany, Italy

M. Lanigra  
U. O. Emergenza ed Accettazione Ospedale  
Misericordia e Dolce USL4 Prato,  
Prato, Italy

recognition by the regional government. The program includes 8 weeks of clinical rotations, 5 full-day workshops, and 48 1-h lectures based on the American and European core contents of EM [2, 3]. One of these workshops as well as some lectures were dedicated to airway management. At the end of the course, written and oral exams were administered to all participants who successfully completed the training. At the end of the written exam a survey regarding intubation practices was answered by all the candidates.

## Methods

A written questionnaire was administered at the end of the written exam for the qualification course. A total of 153 people received the survey. These were all doctors that worked either in the ambulance system or the emergency department. Questions were asked regarding type of work environment (ambulance or ED), whether the physician performed intubations, use of medications and methods to confirm endotracheal tube placement (Table 1). Data were entered and analyzed with a Microsoft Excel 2003 (Redmond, WA) database. The IRB waived consent for the study.

## Results

The survey was administered to 153 participants. Of these 143 (93.4%) completed the survey. Of the survey participants 52 (36.4%) were doctors in the ambulance system and 91 (63.6%) were doctors that worked in the ED. All doctors that work in the ambulance system need to intubate as part of their job. Their primary method of confirmation of placement is direct visualization and auscultation. Since these are prehospital intubations they are normally intubations done in arrest situations or for patients in extremis. Because of the setting limited resources are available, and few if any medications are utilized. Many of the peri- and post-intubation questions in the survey are not relevant to this group. The ambulance physicians were not included in the rest of the analysis since most of the questions were not relevant to their scope of practice.

Complete information about the results can be seen in Table 1.

A total of 73.6% of ED-based physicians report intubating patients. Of those that intubate, 92.3% use sedation and 49.3% use paralytics. No physician was using paralytics in the absence of sedation. While direct visualization of the cords during intubation and auscultation of breath sounds

**Table 1** Questionnaire information

	Summary of data	
	N	%
Surveys administered	153	
Surveys completed	143	93.4%
MDs working in ED	91	63.6%
MDs from ambulance service	52	36.3%
ED doctors that intubate in their ED	67 (out of 91)	73.6%
<i>Of those that intubate:</i>		
Use of paralytics	33	49.3%
Sedation	132	92.3%
Midazolam	45	59.7%
Propofol	31	46.3%
Fentanyl	14	20.9%
Methods of confirmation		
Direct visualization	65	97%
Auscultation of breath sounds	67	100%
CO2 detector	8	11.9%
Post intubation		
Nasogastric tube placement	39	58.2%
Chest radiograph	34	50.7%
Questionnaire administered (translated from the Italian)		
Place of work:	Ambulance or hospital	
Do you intubate	Yes/no	
Do you use sedation	Yes/no	
If yes, what medications		
Do you use paralytics	Yes/no	
If yes, which paralytics		
For ET tube placement confirmation do you:		
Auscultate	Yes/no	
Directly visualize	The cords yes/no	
Use CO2 detector	Yes/no	
Routinely place an NGT post intubation		Yes/no
Routinely obtain a post intubation radiograph		Yes/no

after intubation are the most common methods used to confirm correct endotracheal tube (ETT) placement (97% and 100%, respectively), only 11.9% use colorimetric CO2 detectors for confirmation of tracheal tube placement.

After intubation, 58.2% routinely place a nasogastric tube, and 50.7% obtain a post-intubation chest radiograph.

## Limitations

This was a survey study and therefore relies on the accuracy of the answers of the participants. It was limited to one region of Italy so it may not reflect intubation practices in the whole country.

## Discussion

While airway management is part of what defines EPs in the USA, this may not be the case throughout the world. Emergency medicine is not a recognized specialty in Italy. Because of this there is a wide variation in the physicians that practice in EDs. Although the majority of doctors that work in the Tuscan EDs intubate patients, there are several differences in practice between EPs in Tuscany and in the US. In many EDs intubations are primarily or exclusively done by anesthesia. Even in EDs where EPs intubate, they may only be doing so in arrest or peri-arrest situations.

The use of paralytics for intubation together with sedation was used at least sometimes by only 49.3% of Tuscan EPs. This is in contrast to uniform training in RSI during residency and a 78% to 84% rate of RSI use in the US [4, 5]. We can only speculate as to the reason for this, but training, level of comfort with the performance of the procedure as well as availability of medications may play a role.

The use of clinical methods to confirm ETT placement, both visualization of the cords and auscultation of breath sounds, is almost universal. Secondary methods of ETT confirmation are less widespread. While colorimetric CO<sub>2</sub> detectors have been recommended for quick confirmation of endotracheal intubation, their use is not widespread in Tuscany [6]. This may be due to practice patterns or lack of availability of the device. We did not ask whether the device was available in the practitioner's ED, so cannot differentiate between these two possibilities.

Post intubation chest radiographs are routinely obtained in the US after emergency intubation. Several studies recommend its use [7–9]. This is not the case in Tuscany where only 50.7% of subjects say they routinely obtain a post-intubation chest radiograph. Many of the EPs that do not routinely obtain a post-intubation radiograph feel that clinical methods for confirmation of tube position are adequate. They point to anesthesiologists in the operating room and the fact that radiographs are not the standard of care post-intubation in this group. Whether these two groups are comparable is debatable.

In retrospect, questions regarding the availability of specific medications and colorimetric CO<sub>2</sub> detectors as well as barriers to obtaining chest X-rays would have given us

more information that may have helped delineate some of the reasons for differences in practice.

## Conclusions

In summary, practice patterns in the US and Tuscany are different. Management of the airway by EPs, RSI and post-intubation radiographs are the standard of care in EDs in the US. This is not the case in Tuscany. We would expect the rate of RSI to increase as EPs in Tuscany receive specific training and become more comfortable with the procedure. Evaluation of the utility of post-intubation radiographs warrants prospective study in Tuscany. Validation of the utility of the practice in the US may also be indicated.

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