

The copyright of this thesis vests in the author. No quotation from it or information derived from it is to be published without full acknowledgement of the source. The thesis is to be used for private study or non-commercial research purposes only.

Published by the University of Cape Town (UCT) in terms of the non-exclusive license granted to UCT by the author.

**An Evaluation of Documentation of  
Endotracheal Intubation in Cape Town  
Emergency Centres.**

**By**

**Dr. Philip G. Cloete**

**CLTPHI002**

Submitted to the University of Cape Town

In partial fulfilment of requirements for degree

MMed in Emergency Medicine

Faculty of Health Sciences, University of Cape Town

Submission date: November 2010

Supervisors:

Dr H Geduld

Prof LA Wallis

## DECLARATION

Herewith I, Philip G Cloete declare that all work performed in relation with this dissertation is my own original unaided work (except where otherwise acknowledged.) It is submitted for the degree MMed in Emergency Medicine.

Neither the dissertation in full nor part thereof has been submitted to any other university or for another degree.

---

Signed on: \_\_\_\_\_ day of \_\_\_\_\_ 2010

# TABLE OF CONTENTS

<b>Table of Abbreviations</b>	<b>4</b>
<b>Abstract</b>	<b>5</b>
<b>Introduction</b>	<b>6</b>
<b>Aims &amp; Objectives</b>	<b>8</b>
<b>Literature Review</b>	<b>9</b>
<b>Methodology</b>	<b>20</b>
<b>Ethics</b>	<b>21</b>
<b>Article for submission</b>	<b>22</b>
<b>Proposal as Submitted for Ethics approval</b>	<b>44</b>
<b>Appendix A: EMSSA Guideline 10</b>	<b>56</b>
<b>Appendix B: Data Collection Questionnaire</b>	<b>57</b>
<b>Appendix C: EMJ Instructions for Authors</b>	<b>59</b>
<b>References</b>	<b>64</b>

## Abbreviations

<b>EC</b>	Emergency Centre
<b>EMSSA</b>	Emergency Medicine Society of South Africa
<b>MPS</b>	Medical Protection Society
<b>SA</b>	South Africa
<b>SASA</b>	South African Society of Anaesthesiologists
<b>AIMS</b>	Anaesthetic Information Management Systems
<b>RSI</b>	Rapid sequence intubation
<b>CO2</b>	Carbon Dioxide
<b>ICD10</b>	International Statistical Classification of Diseases and Related Health Problems (10 <sup>th</sup> Revision)
<b>EHR</b>	Electronic Health Record

## **Abstract**

### **Objectives**

To assess the quality of medical note keeping by doctors when performing endotracheal intubations in two Emergency Centres (EC) in Cape Town, South Africa.

### **Method**

We undertook a retrospective case review of medical records in two regional hospitals in Cape Town. All adult patients intubated in the EC during the 6 months 1 July to 31 December 2008 were included. A single researcher assessed the case notes to assess documentation of specific procedural criteria: indication for intubation, drugs & doses, endotracheal tube size, laryngoscopy, insertion depth, securing method, position confirmation, ventilator settings and complications. General medical documentation including demographics and legibility of physician name were also assessed. Results are presented using basic descriptive statistics of the 32 criteria analysed.

### **Results**

159 Endotracheal intubations were identified. 11 were excluded due missing or incomplete records. 148 patient records were analysed. Note keeping was generally poor with 22 from 32 specified criteria documented in less than 40 % of cases and 3 criteria not mentioned at all. Only 4 specified criteria were documented in more than 90 % of patients (date & time, sex, specified indication for intubation and legible physician name.)

### **Conclusions**

Documentation of endotracheal intubation by doctors in Cape Town is of poor quality. We recommend the design and implementation of a template / form for use in the EC to improve the quality of documentation.

## Introduction

Medical documentation remains paramount to patient care, regarding previous, current and future healthcare encounters. Medical documentation needs to be accurate, comprehensive, contain appropriate detail, be written in an organised manner and be legible to ensure quality healthcare.

Medical documentation in patient records is of relevance for planned care, communication with other healthcare providers, billing codes, evaluation of quality standards as well as for medico-legal purposes.<sup>1</sup> From the medical record another healthcare provider should be able to continue care and be certain of the presenting complaint, applicable history, positive and negative clinical findings, procedures performed, medication administered and care plan of the patient.<sup>1, 2</sup>

With the current worldwide increase in medical litigation the importance of good clinical documentation in patient records needs to be emphasised, especially as documentation is used as evidence during litigation. According to the Medical Protection Society (MPS) poor note-keeping is associated with sub-standard clinical practice.<sup>2</sup>

Documentation need to include the patient consultation, informed consent obtained, procedures performed as well as surgical notes if applicable. In Emergency Medicine, procedures are performed daily in the Emergency Centre (EC) and documentation thereof is essential. The procedure of endotracheal intubation is common in emergency medicine internationally as definitive care of the airway is required in many critically ill patients.<sup>3,4</sup>

In South Africa (SA) failed endotracheal intubation rate in the pre-hospital environment was found to be 9%, with an additional 14% recognised as oesophageal intubations. In view of this complication rate and the absence of EC data, good documentation is of utmost importance.<sup>5</sup> Documentation following endotracheal intubation needs to be accurate as this is the only evidence stipulating indications, medication administered, confirmation of successful placement and any complications of the procedure. This lifesaving procedure can and has been the subject of medical litigation as well as adversely influencing patient morbidity and mortality.<sup>6-9</sup>

Without adequate medical records, the outcome and quality of any procedure performed including endotracheal intubation cannot be proven, thus leaving the healthcare provider liable to litigation.

In South Africa there is no literature pertaining to documentation of endotracheal intubation and the current practice is thus unknown. There are no validated guidelines stipulating the minimum or suggested criteria for use in documenting endotracheal intubation in the EC in South Africa. The variation in recordkeeping lends itself to possible medico-legal litigation.

The need to assess quality of documentation of endotracheal intubation was identified by the authors and this case review aims to assess the current quality of documentation of endotracheal intubation in patient records in the EC's of two hospitals in the Western Cape.



## **Aim**

The aim of this study is to assess the adequacy/quality of documentation of endotracheal intubations in EC's in Cape Town.

## **Objectives:**

1. To review endotracheal intubation documentation against a minimum standard
2. Develop a template for use in medical documentation regarding endotracheal intubation in the Western Cape from this data.
3. Promote awareness regarding improvement of documentation following endotracheal intubation.

University of Cape Town

## **Literature review:**

The method of literature search included searching the databases of Medline, pre-Medline and Ovid from January 1995 until November 2010. The search terms (MeSH terms) for the search were: documentation and endotracheal intubation, medical documentation, electronic medical documentation, medical litigation and documentation as well as endotracheal intubation guidelines. Searches were limited to English language articles.

These produced 9901 articles of which 47 were found to be relevant.

A review of the extracted articles produces another 35 articles of which 23 were found to be relevant. Additional searches of the grey literature were performed including websites (Google scholar, greynet, biomedcentral.)

Unpublished literature as well as theses and dissertations from South Africa were also examined. These produced 5678 articles of which 39 were found to be relevant.

A total of 15 614 articles were found of which 109 were included in the literature review.

In South Africa pre-hospital intubation by paramedics in the Western Cape has been assessed and yielded a failed intubation rate of 9%.<sup>5</sup> The rate of recognised oesophageal intubations was found to be 14%; the authors of this study showed that paramedics are called upon to intubate patients in “community health centres / day hospitals” with a doctor being present in 19% of cases, but unable to perform the procedure. They also emphasised the need for skill retention, aspiration prevention, pre-oxygenation, equipment shortages (including capnography monitoring) and cervical spine immobilisation. From this data they suggested re-designing documentation

forms, centralising the storage and retrieval of completed records as well as an electronic database to improve the current documentation practise and protocol development.<sup>5</sup>

Rapid sequence intubation (RSI) is the gold standard for intubation in the emergency centre.<sup>10,11</sup> Internationally RSI has been proven to increase successful intubations and decrease complications.<sup>12-15</sup> The EMSSA Protocol for Rapid Sequence Intubation in Emergency Centres Adult and Paediatric provide guidelines on RSI performance in South Africa.<sup>16</sup> Indications for RSI include inability to protect or maintain the airway, respiratory failure (oxygenation / ventilation), trauma and expected complications during transport (ex. air transport.)<sup>16</sup> Emergency Physicians has been proven capable of performing RSI.<sup>17-19</sup>

Literature comparing the anaesthetist to emergency physician or non anaesthetist with respect to intubation skills and percentage of procedures performed by each, abounds.<sup>14, 18-21</sup> The success rate of RSI by emergency physicians range from 83% to 99% (2 or less attempts.)<sup>12-14,18,22</sup> Stevenson et al compared emergency physicians to anaesthetists in a prospective trauma cohort with both disciplines intubating 97% of patients successfully using RSI, the anaesthetist group had better laryngoscopy views and higher first attempt intubation rate compared to emergency physicians. Comparable complication rates were found between the disciplines.<sup>11</sup>

In the United States of America (USA) the responsibility for the acute airway lies with the emergency physician whereas in the United Kingdom (UK) it is still viewed to be the anaesthetist's responsibility.<sup>17</sup>

In South Africa emergency centre doctors, regardless of their level of training, skill and experience are primarily responsible for emergency airway management. This responsibility of unsupervised airway management may fall on junior staff with limited skill and training. Airway management skills and the documentation associated therewith should be emphasised in the undergraduate medical curriculums across South Africa as well as in emergency medicine registrar training.<sup>23</sup>

Good documentation impacts directly on quality patient care. MPS South Africa published guidelines on “Keeping Medical Records” and emphasise the importance of good records especially when multiple healthcare providers are involved with patient care, this implicates the importance in the EC where doctors tend to work shifts.<sup>2</sup>

Medical documentation needs to be accurate, comprehensive, contain appropriate detail, be written in an organised manner and be legible to ensure quality healthcare. Medical documentation improves communication with other healthcare providers, the notes should enable another healthcare provider continue care and be certain of the presenting complaint, applicable history, positive and negative clinical findings, procedures performed, medication administered and care plan of the patient.<sup>1, 2</sup>

Medical documentation is also used as evidence for disciplinary or medico-legal action. According to Medical Protection Society (MPS) it is self evident that poor note keeping is associated with poor clinical practice.<sup>2</sup>

Problems that recur in litigation claims include omission of the following:

- negative clinical findings
- allergies
- special investigation results
- content of discussion during consultation
- time, date and signature.

Other problems relating to documentation include legibility of handwriting, writing in the wrong patient folder and alterations or additions to notes afterwards. Informed consent for any procedure as well as details regarding the performance thereof is essential.<sup>2</sup>

Internationally literature regarding documentation of endotracheal intubation includes a medical record review conducted pre-and post-implementation of an educational program in Perth, Western Australia.<sup>24</sup> The educational program consisted of repeated formal lectures, distribution of written documents and pro-forma checklists, display of the pro-forma checklists in the EC and addition of the checklist as template for documentation. The authors concluded that documentation of endotracheal intubation was poor. The data showed only slight improvement in documentation of specified criteria including drugs and drug dosages, grade of laryngoscopy, endotracheal tube size, placement confirmation and adverse events/complications following endotracheal intubation following the educational program and implementation of template for documentation.<sup>24</sup>

Possible reasons for this minimal improvement include a suboptimal educational programme that might have benefitted from different delivery modalities, improved exposure to all staff and confirmation of staff exposure

by evaluation. Other reasons include time constraints in the working environment of an EC and different physicians performing the procedure and documentation thereof.<sup>24</sup>

In the USA documentation skills in emergency medicine is thought to be an integral part of emergency medicine residency training. Documentation communicates with other care providers including nurses, colleagues and other disciplines. Documentation is pertinent in medico-legal protection, and is utilised in calculating reimbursement according to ICD 10 codes. Studies suggest that even in these first world environments there is still potential to improve resident training. Weizberg et al emphasised the importance of acquiring documentation skills during residency as practice is less likely to change in senior level physicians.<sup>25</sup>

The American College of Emergency Physicians (ACEP) has a policy statement on medical records in the emergency department.<sup>26</sup> ACEP state that “high quality emergency department medical records promote improved patient care.”<sup>26</sup> Currently available medical record systems include handwritten, transcribed, template and electronic. Handwritten records are well known but require storage space for prolonged periods; transcribed records require typing from dictated verbal recordings or written records. Template use has been instituted especially for procedural documentation. Electronic records are currently topical internationally where the physician enter records real-time on computer software programmes.<sup>27</sup> Electronic Health Records (EHR) eliminates illegible handwriting, minimise interruptions

to care and improve access to medical records, but is vulnerable to internet theft and accessible for litigation purposes.<sup>27</sup> Effective documentation in emergency medicine should record clinically relevant aspects of patient evaluation, management including procedures, thought and decision making processes as well as patient disposition. The system used must not negatively impact on physician productivity and be readily accessible.<sup>26</sup> Assessment of current quality of documentation in disciplines other than emergency medicine shows similar suboptimal results. The Leeds Paediatric Intensive Care Unit experience showed formal documentation of intubation in patient records to be 64% or approximately two thirds of the total procedures performed during a prospective case review.<sup>28</sup> Review of the relevant Emergency Medicine literature failed to show any studies in South African EC's evaluating documentation and more specifically documentation related to endotracheal intubation. The only suggested guidelines regarding required documentation of endotracheal intubation is from the Emergency Medicine Society of South Africa (EMSSA).<sup>29</sup> This guideline mainly focuses on and serves as memory aid in the pre-hospital environment utilising a checklist.

Checklist items suggest including the following in documentation:

- direct visualisation during intubation
- five point auscultation
- chest movement
- endotracheal tube size
- measurement of insertion length
- name of person performing intubation
- time and date of intubation
- indication for intubation
- Glasgow coma scale
- arterial blood gas values
- medication and administration times
- degree of difficulty of intubation
- ventilator settings

**(Appendix A)**

This guideline has not been validated in a hospital environment.<sup>29</sup>

In South Africa an audit performed in Cape Town assessing anaesthetic record keeping showed only one third of anaesthetic records were complete and legible when assessing five specified criteria.<sup>30</sup> The criteria used were use of the anaesthetic record, legibility of the record, documentation of drugs used, documenting of patient observations and description of any clinical examination finding. The audit showed in 25% of cases no records were utilised and in approximately half, the records were incomplete or illegible.

Reference was made to the fact that documentation in the medical record is



of utmost importance during medical malpractice defence. The authors of this study concluded that in the study sample the documentation standards were unacceptable practice and recommended adherence to the South African Society of Anaesthesiologist's (SASA) standard of practice which include completion of a relevant anaesthetic record.<sup>30</sup>

Anaesthetic record keeping internationally shows a trend towards using electronic format anaesthetic information management systems (AIMS), even with these systems documentation in patient records is not 100% complete.<sup>31</sup> The advantages of AIMS include improved recording of intra-operative physiological data, increased accuracy of data, improved legibility and decreasing workload of written charts.<sup>32</sup> Disadvantages of AIMS include artefact recording, high cost, resistance to use from anaesthesiologists, possible increase medico-legal litigation and negligence as all data isn't necessarily interpreted by the anaesthesiologist any more.<sup>32</sup>

Emergency centre doctors generally see more patients per hour in a less controlled environment, documentation in this group would be expected to have a lower standard than that of the anaesthetists. Significant non-patient hours are occupied by note keeping in emergency centres.<sup>33</sup>

The EMSSA guidelines emphasise verification of endotracheal tube placement and concluded that the detection of end tidal carbon dioxide (CO<sub>2</sub>) is more reliable compared to direct visualisation during intubation, post intubation examination, pulse oxymetry and chest X-Ray [caveat to this end tidal CO<sub>2</sub> detection is that it becomes inaccurate in patients with poor or absent perfusion ex. patients in cardio-respiratory arrest.<sup>29</sup>]

Measurement of exhaled CO<sub>2</sub> is accepted widely as a standard of care in adult and paediatric intensive care and in anaesthetised patients.<sup>34</sup>

The 2010 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations (CoSTR) statement commented on exhaled CO<sub>2</sub> detectors including detectors displaying waveform, non-waveform (digital and colorimetry) in confirming endotracheal tube placement. They recommended continuous waveform capnography in cardiac arrest patients to confirm and monitor endotracheal tube position. The recommendation is to use exhaled CO<sub>2</sub> detection combined with clinical findings (visualisation and auscultation) to confirm endotracheal tube placement.<sup>35</sup> They also recommended that non-waveform CO<sub>2</sub> detector (capnometry) or endotracheal detector device be used as alternatives combined with clinical findings in the absence of continuous waveform capnography.<sup>35</sup> Continuous capnography might facilitate early detection of endotracheal tube dislodgement during patient transport.

Currently more emphasis is found in the literature on ultrasound use for endotracheal tube placement confirmation. Ultrasound is used to directly visualize intubation as well as confirm correct positioning by witnessing the lung sliding sign (sliding of visceral on parietal pleura.) Combining trans-cricothyroid membrane ultrasonography with ultrasound confirmation of lung-sliding has been shown to be of potential benefit in confirmation of endotracheal intubation in the emergency centre.<sup>36</sup> Testing this hypothesis in cadaver models confirmed sensitivity and specificity approaching 100 % for ultrasound visualisation of the lung-sliding sign as confirmation of

endotracheal tube placement. The same study utilising cadavers showed potential use of ultrasound to differentiate right main bronchus intubation from tracheal intubation.<sup>37</sup> Documenting of the ultrasound findings will thus be of importance as this imaging modality increases in use.

In the USA, Electronic Health Records (EHR) was prominent in political discussion leading to legislation in form of The Health Information Technology for Economic and Clinical Health Act (HITECH.) Hospitals would receive incentives when changing to and using EHR's.

EHR's potentially could improve quality of care, patient safety and physician efficiency, thus improving decision making and error prevention.<sup>38</sup> During the next decade EHR's are likely to be standard practice in US hospitals.

Electronic Health Records if integrated correctly will provide essential information on arrival of any patient to the emergency centre irrespective of ability to communicate. The interactive interface of EHR aims to minimise interruptions of flow and improve clinical records by utilising templates, narration and data input from instruments directly. Further benefit is gained by minimising the illegibility of handwritten notes.<sup>39</sup>

In European countries EHR implementation is estimated to be more advanced than the USA. Estimations of 98% implementation in the Netherlands, stands in contrast to approximately 30 % of physicians opposing the implementation of a central registry in that country. In Britain the National health service has moved toward centralising the records of the emergency system but the program implementation has been suspended following protest from the British Medical Association (BMA) that patients has

been granted insufficient opportunity to opt out. The NHS awaits improved public and physician support before re-implementing the planned EHR.<sup>39, 40</sup> Thus implementation of such a system needs to be considered carefully contrasting patient privacy, vulnerability of information to internet theft and availability of information for use in litigation to care continuity, access to medical records, special investigations and facilitation of research.<sup>41</sup> In SA several private Hospitals as well as Albert Luthuli Hospital in Durban already utilises EHR systems. Implementation of EHR's in SA will have significant logistical and financial constraints but has potential to benefit patient care.

University of Cape Town

**Methodology:**

Review of the documented case notes regarding endotracheal intubation of patients intubated in EC's of two hospitals in Cape Town, Western Cape, South Africa.

**Setting:**

The two hospitals included are Victoria and GF Jooste Hospitals. The choice of hospitals was made because of the numbers of emergency intubations performed as well as the wide spectrum of medical and trauma cases seen in these emergency centres.

**Timeline:**

6 Months from 1 July to 31 December 2008.

**Inclusion & Exclusion criteria:**

Only patients older than 18 years who were intubated in the EC of Victoria or GF Jooste were included. All patients on whom endotracheal intubations were performed were identified. Patients in whom the case notes were missing or incomplete were excluded (these mentioned patients were identified as having been intubated but on review of the patient folders the doctors documentation were missing and could thus not be included.)

**Data collection:**

The investigator performed a retrospective case review of medical records. Patients were identified utilising the resuscitation room register, "clinicom" system (administrative software used to record patient demographics and hospital admission) as well as the intensive care unit register of admissions from the resuscitation room for the mentioned period. Data collection was performed by the principal investigator from patient folders kept in the

records department of both hospitals. Data was collected by a single researcher. A data collection sheet (**Appendix B**) was used to collect data only confirming the presence (yes) or absence (no) of stipulated criteria in the documentation relating to the performed endotracheal intubation. Criteria assessed were date & time, sex, GCS, indication, drugs, drug doses, endotracheal tube size, laryngoscopy, insertion depth, securing method, position confirmation, ventilator settings, complications and legibility of physician name.

#### **Data Analysis:**

Data capturing was performed using Microsoft Excel 2007 (Microsoft Richmond Va), and analysis performed using STATA10 (Statacorp.) All data are presented using 95% confidence intervals. All data were stored in a password protected database by the principal investigator.

#### **Ethics**

Approval was obtained from the Departmental Research Ethics Committee, Department of Surgery, Faculty of Health Sciences, University of Cape Town. Rec Ref: 2009/135.

Permission to access information was obtained from the Hospital Superintendants, Heads of Emergency Centres and Heads of Medical Records at both institutions. As no patient or healthcare professional's details were used, individual patient consent was not required.

## ARTICLE FOR SUBMISSION

Documenting endotracheal intubation in South African Emergency  
Centres: what is the current practice?

Philip G Cloete, Heike Geduld, Lee A Wallis.

Division of Emergency Medicine

University of Cape Town

Cape Town

South Africa

**Corresponding Author:** Dr Philip G Cloete

16 Pondicherry Avenue, Hout Bay, Cape Town, South Africa

[pgcloete@nashuaisp.co.za](mailto:pgcloete@nashuaisp.co.za)

Cell: +2782 8006 705

Fax: +2721 790 0968

**MeSH Words:** documentation and endotracheal intubation, medical  
documentation, medical litigation and documentation and, endotracheal  
intubation guidelines

**Word Count:** 2450

## **Abstract**

### **Objectives**

To assess the quality of medical note keeping by doctors when performing endotracheal intubations in two Emergency Centres (EC) in Cape Town, South Africa.

### **Method**

We undertook a retrospective case review of medical records in two busy hospital EC's in Cape Town. All adult patients intubated in the EC over a 6 month period were included. A single researcher assessed the case notes to assess documentation of specific procedural criteria: indication for intubation, drugs & doses, endotracheal tube (ETT) size, laryngoscopy, insertion depth, securing method, position confirmation, ventilator settings and complications. Results are presented using basic descriptive statistics of the 32 criteria analysed.

### **Results**

159 Endotracheal intubations were identified. 11 were excluded due missing or incomplete records. 148 patient records were analysed. Documenting was generally poor with 22 from 32 specified criteria documented in less than 40% of cases and 3 criteria not mentioned at all. Only 4 specified criteria were documented in more than 90% of patients (date & time, sex, specified indication for intubation and legible physician name.)

### **Conclusions**

Documentation of endotracheal intubation by doctors in Cape Town is of poor quality. We recommend the design and implementation of a template / form for use in the EC to improve the quality of documentation.



## Introduction

Medical documentation remains paramount to patient care, regarding previous, current and future healthcare encounters. Medical documentation needs to be accurate, comprehensive, contain appropriate detail, be written in an organised manner and be legible to ensure quality healthcare.

Medical documentation in patient records is of relevance for planned care, communication with other healthcare providers, billing codes, evaluation of quality standards as well as for medico-legal purposes.[1] From the medical record another healthcare provider should be able to continue care and be certain of the presenting complaint, applicable history, positive and negative clinical findings, procedures performed, medication administered and care plan of the patient.[1,2]

With the current worldwide increase in medical litigation the importance of good clinical documentation in patient records needs to be emphasised, especially as documentation is used as evidence during litigation. According to the Medical Protection Society of South Africa (MPS) it is self-evident that poor note-keeping is associated with sub-standard clinical practice.[2]

In Emergency Medicine, procedures are performed daily in the Emergency Centre (EC) and documentation thereof is essential. The procedure of endotracheal intubation is common in emergency medicine internationally as definitive care of the airway is required in many critically ill patients.[3,4]

In South Africa (SA) the failed endotracheal intubation rate in the pre-hospital environment has been shown to be up to 9%, with an additional 14% recognised oesophageal intubations.[5] In view of this complication rate and the absence of EC data, good documentation is of utmost importance.[5]

Documentation following endotracheal intubation need to be accurate as this often is the only evidence stipulating the indications, medication administered, confirmation of successful placement and complications of the procedure. This lifesaving procedure can and has been the subject of medical litigation, as well as adversely influencing patient morbidity and mortality.[6,7]

Without adequate medical records the outcome and quality of any procedure performed including endotracheal intubation cannot be proven, thus leaving the healthcare provider liable to litigation.

In SA there is no literature pertaining to documentation of endotracheal intubation in the EC and the current practice is thus unknown. There is no validated guideline stipulating the minimum or suggested criteria for use in documenting endotracheal intubation in the EC in SA.

The need to assess quality of documentation of endotracheal intubation was identified by the authors and this case review aims to assess the current quality of documentation of endotracheal intubation in patient records in the EC's of two hospitals in the Western Cape.

We undertook this study to assess the adequacy of documentation of endotracheal intubations in EC's in Cape Town.

**Methodology:**

Review of the documented case notes regarding endotracheal intubation of patients intubated in EC's of two hospitals in Cape Town, South Africa.

**Setting:**

The two hospitals included are Victoria and GF Jooste Hospitals. The choice of hospitals was made because of the numbers of emergency intubations performed as well as the wide spectrum of medical and trauma cases seen in these emergency centres.

**Timeline:**

6 Months from 1 July to 31 December 2008.

**Inclusion & Exclusion criteria:**

Only patients older than 18 years, intubated in the study EC's were included.

All patients on whom endotracheal intubations were performed were identified.

Patients in whom the case notes were missing or incomplete were excluded.

**Data collection:**

We performed a retrospective case review of medical records. Patients were identified utilising the resuscitation room register, "clinicom" system (administrative software used to record patient demographics and hospital admission) as well as the intensive care unit register of admissions from the resuscitation room for the study period. Data collection was performed by the principal investigator from patient folders kept in the records department of both hospitals. Data was collected by a single researcher. A data collection sheet (**Web appendix 1**) was used to collect data only confirming the presence (yes) or absence (no) of stipulated criteria in the documentation

relating to the performed endotracheal intubation. Criteria assessed were date & time, sex, GCS, indication, drugs, drug doses, endotracheal tube size, laryngoscopy, insertion depth, securing method, position confirmation, ventilator settings, complications and legibility of physician name.

### **Data Analysis:**

Data capturing was performed using Microsoft Excel 2007 (Microsoft Richmond Va), and analysis performed using STATA10 (Statacorp.) All data are presented using 95% confidence intervals. All data were stored in a password protected database by the principal investigator.

### **Ethics**

Approval was obtained from the Departmental Research Ethics Committee, Department of Surgery, Faculty of Health Sciences, University of Cape Town. Permission to access information was obtained from the hospital authorities at both institutions. As no patient or healthcare professional's details were used, individual patient consent was not required.

### **Results:**

A total of 159 patients were identified, 11 were excluded due to missing or incomplete records. 148 patients were included in the case review.

In more than 90% of patients date & time (95.6%), sex (94.6%), indication for intubation (98%) and legible physician name (94%) were documented.

Medication used during the procedure were documented less, drugs used specified only 47.2%, with induction agents 45.2% and neuromuscular blockers 36.2% of cases reviewed. Only 6.8% of cases included mention on rapid sequence intubation (RSI.) Descriptive details of the procedure

included ETT size 50.7%, difficult airway 4.1 %, visualisation of cords 2 %, confirmation of ETT placement 11.5% and ventilator settings 10.1 %.

(Table 1.) **Table 1 here**

### **Discussion:**

This study suggests that documentation relating to endotracheal intubation in EC's in Cape Town is of poor quality. There are no previous studies to compare these results against in SA.

In SA pre-hospital intubation by paramedics in the Western Cape has been assessed and yielded a failed intubation rate of 9%.<sup>[5]</sup> The rate of recognised oesophageal intubations was found to be 14%. The authors emphasised the need for skill retention, aspiration prevention, pre-oxygenation, equipment shortages (including capnography monitoring) and cervical spine immobilisation relating to endotracheal intubation. They suggested re-designing documentation forms, centralising the storage and retrieval of completed records as well as an electronic database to improve the current documentation practise and protocol development.<sup>[5]</sup>

We found that there were significant omissions in documentation relating to rapid sequence intubation (RSI), drugs used, and specific drug doses. RSI is the gold standard for intubation in the EC.<sup>[8,9]</sup> Internationally RSI has been proven to increase successful intubations and decrease complications.<sup>[10-12]</sup> The Emergency Medicine Society of South Africa (EMSSA) Protocol for Rapid Sequence Intubation in Emergency Centres Adult and Paediatric provide guidelines on RSI performance in SA.<sup>[13]</sup> Indications for RSI include inability to protect or maintain the airway, respiratory failure (oxygenation /

ventilation), trauma and expected complications during transport (ex. air transport).[13] Emergency physicians have been proven capable of performing RSI.[13-15]

Literature comparing the anaesthetist to emergency physician or non anaesthetist intubation skills and percentage of procedures performed by each abounds.[15-17] The success rate of RSI by emergency physicians range from 83 % to 99 % (2 or less attempts.)[10,11,15,18] One study comparing emergency physicians to anaesthetists in a prospective trauma cohort found that both disciplines intubated 97 % of patients successfully using RSI (although the anaesthetist group had better laryngoscopy views and higher first attempt intubation rate.) Comparable complication rates were found between the disciplines.[9]

In the United States of America (USA) the responsibility for the acute airway lies with the emergency physician whereas in the United Kingdom (UK) it is still viewed to be the anaesthetist's responsibility.[14] In SA EC doctors, regardless of their level of training, skill and experience are primarily responsible for emergency airway management. This responsibility of unsupervised airway management may fall on junior staff with limited skill and training. Airway management skills and the documentation associated therewith should be emphasised in the undergraduate medical curriculums across SA, as well as in emergency medicine registrar training.[19]

Good documentation impacts directly on quality patient care. The Medical Protection Society of South Africa (MPS) published guidelines on "Keeping Medical Records" which emphasise the importance of good records

especially when multiple healthcare providers are involved with patient care; this is of special importance in the EC where doctors tend to work shifts.[2]

Medical documentation needs to be accurate, comprehensive, contain appropriate detail, be written in an organised manner and be legible to ensure quality healthcare.[1] Good medical documentation improves communication with other healthcare providers.[1,2] Notes should enable another healthcare provider to continue care and be certain of the presenting complaint, applicable history, positive and negative clinical findings, procedures performed, medication administered and care plan of the patient.[1,2]

Medical documentation is also used as evidence for disciplinary action or medico-legal litigation. According to MPS, poor note-keeping is associated with poor clinical practice.[2]

Problems that recur in litigation claims include omission of the following:

- negative clinical findings
- allergies
- special investigation results
- content of discussion during consultation
- time, date and signature.

Other problems relating to documentation include legibility of handwriting, writing in the wrong patient folder and alterations or additions to notes afterwards. Informed consent for any procedure as well as details regarding the discussion thereof is essential.[2]

A medical record review of documentation of endotracheal intubation was performed in Australia. Data were collected regarding documentation of

endotracheal intubation pre-and post-implementation of an educational program. This program consisted of repeated formal lectures, distribution of written documents and pro-forma checklists (displayed in the EC and added as a template for documentation.) The authors concluded that documentation of endotracheal intubation was poor. The data showed only slight improvement in documentation of specified criteria including drugs and drug dose, grade of laryngoscopy, endotracheal tube size, placement confirmation and adverse events/complications following endotracheal intubation subsequent to the educational program and implementation of template for documentation.[20] Of great concern for local practice is that SA performed much worse in all 5 categories (Figure1.)[20]

**Figure 1 here**

In the USA documentation skills in emergency medicine is thought to be an integral part of emergency medicine residency training.[21] Documentation communicates with other care providers including nurses, colleagues and other disciplines. Documentation is pertinent in medico-legal protection, and is utilized in calculating reimbursement according to ICD 10 codes. Studies suggest that even in these first world environments there is still potential to improve resident training. The importance of acquiring documentation skills during residency have been emphasised (as practice is less likely to change in senior level physicians.)[21]

The American College of Emergency Physicians (ACEP) has a policy statement on medical records, which states that “high quality emergency



department medical records promote improved patient care.”[22] Currently available medical record systems include handwritten, transcribed, template and electronic. In the SA public health system the majority of records are still handwritten into folders by the physician.

Effective documentation in emergency medicine should record clinically relevant aspects of patient evaluation and management including procedures, thought and decision making processes as well as patient disposition. The system used must not negatively impact on physician productivity and be readily accessible.[22]

The only South African literature regarding documentation of endotracheal intubation is a guideline from EMSSA.[23] This guideline focuses on serving as memory aid in the pre-hospital environment utilising a checklist. The checklist includes multiple data and clinical parameters suggesting the inclusion thereof in documentation (**Web Appendix 2.**) The guideline has not been validated in a hospital environment.[23]

A very low percentage of our records in this study included mention of endotracheal tube position confirmation, laryngoscopy grading, difficulty in airway management and complications encountered. Vital signs (blood pressure, pulse, and respiratory rate) including oxygen saturation and specific ventilator settings (when applicable) were also only documented in minority of records reviewed. From 32 specified criteria 22 (69%) were documented in less than 40 % of cases and 3 criteria (Cormack and Lehane classification, capnography use and CO2 detector device), not mentioned at

all. 4 Criteria were documented in more than 90% of cases (Date & time, Sex, indication for intubation and legible physician name.)

The findings of this study are concerning as the low documentation rate may implicate a lack of training, patient safety, healthcare provider error risk [24] and higher oesophageal intubation rate.[5]

In SA lack of training, patient numbers, time per patient and suboptimal administration services are contributing factors to poor documentation.

An audit performed in Cape Town assessing anaesthetic record keeping showed only one third of anaesthetic records to be complete and legible when assessing five specified criteria (use of the anaesthetic record, legibility of the record, documentation of drugs used, documenting of patient observations and description of any clinical examination finding.)[25] The audit also showed that in 25% of cases no records were utilised and in approximately half, the records were incomplete or illegible. The authors of this study concluded that in the study sample the documentation standards were unacceptable practice and recommended adherence to the South African Society of Anaesthesiologist's (SASA) standard of practice which include completion of a relevant anaesthetic record.[25] Anaesthetic record keeping internationally shows a trend towards using electronic format anaesthetic information management systems (AIMS), although even with these systems in place documentation in patient records is not 100% complete.[26]

Electronic health record (EHR) systems are currently topical internationally where the physician enters records real-time on computer software programs.[27] In SA several private hospitals as well as the public Albert

Luthuli Hospital already utilise EHR systems. Implementation of EHRs will have significant logistical and financial constraints, but has potential to benefit patient care in SA. Implementation of EHR systems need to be considered carefully contrasting patient privacy, vulnerability of information to internet theft and availability of information for use in litigation, to care continuity, access to medical records, special investigations and facilitation of research.[28]

The implementation of a template for completion following endotracheal intubation will improve the quality of documentation and also serve to prevent omission of applicable criteria.[20] A template can also be implemented electronically with EHRs and this has additional benefit with regards to legibility and storage space of records.

Emergency centre doctors generally see more patients per hour in a less controlled environment and one can assume that documentation in this group would be at a lower standard than that of the anaesthetists. In the emergency centre, especially in a resuscitation scenario the physician performing the intubation are not necessarily the person documenting, which might also contribute to the poor quality of documentation [20]

The findings of this study highlight the lack of documentation in EC's relating to endotracheal intubation. It is of great concern that several notes only included few words or single sentences regarding the procedure performed. The improvement of documentation in general, as well as that specifically relating to endotracheal intubation needs to be addressed.

**Limitations:**

We may have missed some patients, but the results are so bad that we believe we have represented the best case scenario. We have not examined the nursing records, where more information may be noted. Data collection was performed by a single researcher and could potentially introduce bias and lead to loss of inter-rater reliability. Our case review has a relatively small sample size of 148 patients, despite this our findings implicate the current quality of documentation following endotracheal intubation.

**Conclusion:**

Endotracheal intubation documentation in EC's in Cape Town is of poor quality. This may reflect poor quality procedures, but at the very least represents a significant medico-legal threat. We recommend the design, implementation and validation of a template / form for use in the EC to improve the quality of documentation.

**Competing interests:**

None to declare

## References:

1. Murphy BJ. Principles of Good Medical Record Documentation. *J Med Pract Manage.* 2001;Mar/Apr:258-260
2. Medical Protection Society 2010. Keeping Medical Records. Available from: [www.medicalprotection.org/southafrica](http://www.medicalprotection.org/southafrica). Accessed 11/11/2010.
3. Butler JM, Clancy M, Robinson N, Driscoll P. An observational survey of emergency centre rapid sequence intubation. *Emerg Med J.* 2001;18:343–348
4. Divatia JV, Bhowmick K. Complications of Endotracheal Intubation and other airway management procedures. *Indian Jour Anaesth.* 2005;49(4);308-318
5. Roos J, James MFM. Prehospital Endotracheal Intubation Practices by Paramedics in the Provincial Ambulance Service of the Western Cape Province of South Africa [M.MeD Thesis]. Cape Town, University of Cape Town 2006.
6. Cheney F. The American Society of Anesthesiologists Closed Claims Project: what have we learned, how has it affected practice, and how will it affect practice in the future? *Anesthesiology.* 1999;91:552-556.
7. Mavroorou A, Stamatiou G, Koutsias S, Michalodimitrakis E, Vretzakis G, Giannoukas AD. Malpractice issues in modern anaesthesiology. *Eur J Anaesthesiol.* 2007;24:903-911
8. Adnet F, Lapostolle F, Ricard-Hibon A, et al. Intubating trauma patients before reaching hospital: revisited. *Crit Care.* 2001;5:290-1

9. Stevenson AGM, Graham CA, Hall R, Korsah P, McGuffie AC. Tracheal Intubation in the emergency department: The Scottish district hospital perspective. *Emerg Med J.* 2007;24:394–397.
10. Sagarin, MJ, Barton, ED, Chng, YM, Walls, RM. Airway management by US and Canadian emergency medicine residents: a multicenter analysis of more than 6,000 endotracheal intubation attempts. *Ann Emerg Med.* 2005; 46:328.
11. Sakles JC, Laurin EG, Rantapaa AA, Panacek EA. Airway management in the emergency department: a one-year study of 610 tracheal intubations. *Ann Emerg Med.* 1998;31:325–32.
12. Cowling KM, Chaney WC, Jones CA. American College of Emergency Physicians Policy Compendium 2010 Edition. Available from: <http://www.acep.org>. Accessed 30/09/2010.
13. Emergency Medicine Society of South Africa. Protocol for Rapid Sequence Intubation in Emergency Centres: Adult and paediatric. Available from: URL: <http://emssa.org.za/practice-guidelines>. Accessed 21/11/2010
14. Nolan J, Clancy M. Editorial IV Airway management in the emergency department. *Br J Anaesth.* 2002;88:9-11.
15. Kovacs G, Law JA, Ross J et al. Acute airway management in the emergency department by non-anesthesiologists. *Can J Anaesth.* 2004; 51:174–80.

16. Carley SD, Gwinnutt C, Butler J, Sammy I, Driscoll P. Rapid sequence induction in the emergency department: a strategy for failure. *Emerg Med J.* 2002;19:109–13.
17. Mackay CA, Terris J, Coats TJ. Prehospital rapid sequence induction by emergency physicians: Is it safe? *Emerg Med J.* 2001;18:20–24
18. Tayal VS, Riggs RW, Marx JA, Tomaszewky CA, Schneider RE. Rapid-sequence Intubation at an Emergency Medicine Residency: Success Rate and Adverse Events during a Two-year Period. *Acad Emerg Med.* 1999;6:31-37.
19. Hobgood C, Anantharaman V, Bandiera G, Cameron P, Halperin P, Holliman J, et al. International Federation of Emergency Medicine model curriculum for medical student education in emergency medicine. *Emerg Med Australas.* 2009;21:367-372
20. Winton J, Celenza A, Jackson T. Improving documentation of endotracheal intubation in an adult emergency centre. *Emerg Med Australas.* 2008;20:488-493.
21. Weisberg M, Cambria B, Farooqui Y, Hahn B, Dazio F, Maniago EM, et al. Pilot study on documentation skills: is there adequate training in emergency medicine residency ? *Emerg Med J.* Published online 23 December 2009. Available from:  
<http://www.sciencedirect.com/science/journal>. Accessed 6/10/2010
22. American College of Emergency Physicians Policy Statements. Patient Medical Records in the Emergency centre. *Ann Emerg Med.* 2009;54(1):143-144.

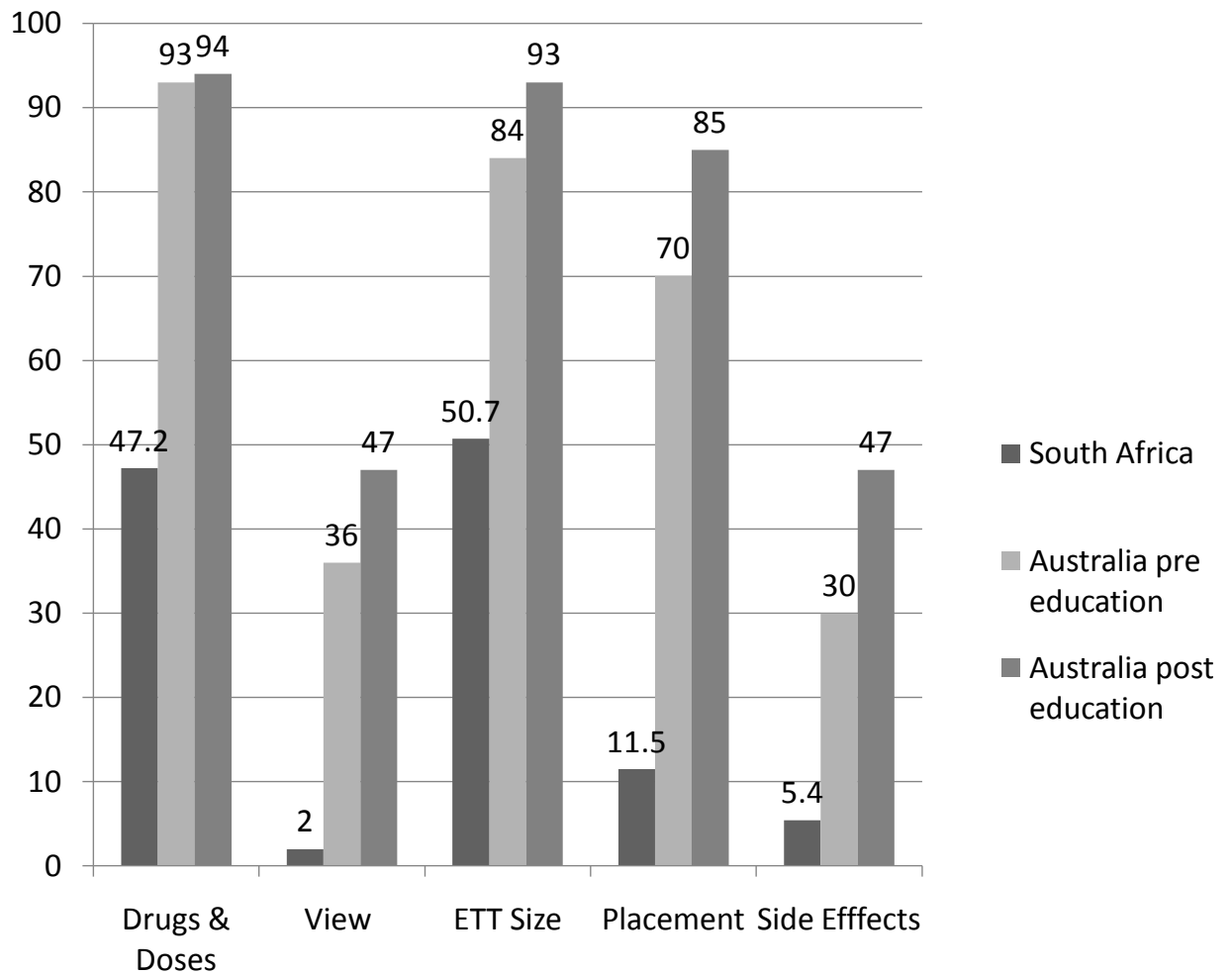
23. Emergency Medicine Society of South Africa. Practice guidelines Verification of endotracheal tube placement. EM010 Available from: <http://emssa.org.za/practice-guidelines>. Accessed 29/08/2010.
24. Griesdale DEG, Bosma TL, Kurth T, Isac G, Chittock DR. Complications of endotracheal intubation in the critically ill. *Intensive Care Med.* 2008;34:1835-1842.
25. Raff M, James MFM. An Audit of anaesthetic record keeping. *SAJAA.* 2003;Jul:7-9
26. Driscoll WD, Columbia MA, Peterfreund RA. An observational study of anesthesia record completeness using an anesthesia information management system. *Anesth Anal.* 2007;104:1454-1461.
27. Millard WB. Electronic Health Records: Promises and Realities Part III. *Ann Emerg Med.* 2010;56(4):A19-A25
28. Millard WB. Electronic Health Records: Promises and realities, Part II: Some Early Voyages in Partially Charted Waters. *Ann Emerg Med.* 2010; 56(3):17A–21A.



<b>Web Appendix 1: Data Collection Sheet</b>		
<b>Information documented in patient folder / notes</b>	<b>Yes</b>	<b>No</b>
Date & Time		
Sex		
GCS		
Was info documented		
Indication for intubation		
Specified:		
Rapid sequence intubation		
Drugs used:		
Induction agent		
Neuromuscular blocker		
No drugs used		
Specified names & dose		
Size of endotracheal tube		
Difficult airway		
Number of attempts		
Visualization of cords described		
Cormack & Lehane Classification		
Additional airway equipment used		
Surgical airway performed		
Depth of insertion - length @ lips/ teeth		
ETT Secured		
Method of securing tube in place		
Tube position confirmed		
5 point auscultation		
CO2 detection: Capnometry / Capnography		
EDD device		
CXR		
Vital signs post intubation		
SaO2		
Ventilator used		
Ventilator settings specified		
Complications of procedure		
Legible physician name		

## Table 1: Data Summary

	Yes (n [% (95% CI)])
<b>Info documented in patient folder / notes</b>	
Date & Time	142 [95.6 (91.4-98.5)]
Sex	140 [94.6 (89.6-97.6)]
GCS	89 [60.1 (51.8-68.1)]
<b>Was info documented</b>	
Indication for intubation	
Specified:	145 [98 (94.2-99.6)]
Rapid sequence intubation	10 [6.8 (3.3-12.1)]
Drugs used:	70 [47.2 (39.0-55.7)]
Induction agent	67 [45.2 (37.1-53.7)]
Neuromuscular blocker	54 [36.4 (28.7-44.8)]
No drugs used	78 [52.7(44.3-61.0)]
Specified names & dose	45 [64.2 (51.9-75.4)]
Size of endotracheal tube	75 [50.7 (42.3-59.0)]
Difficult airway	6 [4.1 (1.5-8.6)]
Number of attempts	4 [2.7 (0.7-6.8)]
Visualization of cords described	3 [2 (0.4-5.8)]
Cormack & Lehane Classification	0 [0 (0-2.5)]
Surgical airway performed	1 [0.7 (0.02-3.7)]
Depth of insertion - length @ lips/ teeth	26 [17.6 (11.8-24.7)]
Tube position confirmed	17 [11.5 (6.8-17.8)]
5 point auscultation	6 [4.1 (1.5-8.6)]
CO2 detection: Capnometry / Capnography	0 [0 (0-2.5)]
EDD device	0 [0 (0-2.5)]
CXR	38 [25.7 (18.9-33.5)]
Vital signs post intubation	18 [12.2 (7.4-18.5)]
SaO2	30 [20.3 (14.1-27.7)]
Ventilator used	34 [23 (16.5-30.6)]
Ventilator settings specified	16 [10.1 (6.3-16.9)]
Complications of procedure	8 [5.4 (2.4-10.3)]
Legible physician name	139 [94 (88.8-97.2)]



**Figure 1: Comparing Cape Town documentation percentages to Australian data pre-and post-educational program [20.]**

# Web Appendix 2: EMSSA Guideline 10

**ENSURE THAT YOU HAVE DOCUMENTED ALL POINTS IN PATIENT'S CASE NOTES**

DATE:  TIME:

ONLY X OR

**CONFIRMATION OF ET TUBE PLACEMENT**

Physical measures <small>(ensure you have documented visualisation, 5 point auscultation, chest rise, tube size and length at lips)</small>	
Continuous End Tidal CO2 monitoring	
CXR	

**DOCUMENTATION**

Ensure you have documented <u>time</u> of intubation & by whom ( <u>name</u> )	
Indication(s) for intubation (clinical parameters) & pre-intubation GCS	
Blood gas investigations results before and after intubation	
Drugs (& times given) used for Rapid Sequence Induction / non-RSI induction	
Whether simple or difficult intubation	

**VENTILATOR REQUIREMENTS**

**T-PIECE SHOULD NEVER BE USED FOR TRANSFERS**

Ensure you have documented ventilator settings (Mode/TV/RR/FiO2/Airway Pb/PEEP/IE Ratio)	
Calculate O <sub>2</sub> requirements according to SOP	

**TRAVEL DRUG REQUIREMENTS**

**NEVER MIX MEDICATIONS IN SAME INFUSION BAG / SYRINGE**

Ensure drugs given via infusion (concentration, rate and start time) & boluses (dose and time) are documented	
Ensure you have adequate medications (including analgesia and sedation) (infusion and/or repeat boluses) to complete the journey safely, allowing for unexpected delays	

**EN ROUTE**

Ensure you have documented departure observations and time	
Continuous monitoring including at least ETCO <sub>2</sub> /O <sub>2</sub> Sats/ECG/BP/FiO <sub>2</sub> /GCS	
Interventions documented (including time)	

**ARRIVAL AT RECEIVING HOSPITAL**

Arrival observations, time & tube position confirmed & documented	
All case notes handed over to receiving staff	

EMSSA Practice Guidelines provide advice on recommended practice for emergency centres, emergency personnel and emergency care activities.

The information within these papers statements is advice only. EMSSA will not be held liable for clinical outcomes related to these Guidelines.

# **Research Proposal: An Audit evaluating documenting of endotracheal intubation in the Emergency Centres of two secondary Hospitals in the Western Cape**

**PG Cloete**

## **Introduction:**

Currently there are no guidelines stipulating the minimum or suggested criteria to use in documenting endotracheal intubation in the emergency centre. The variation in recordkeeping is thus variable and lends itself to possible medico-legal litigation.

Medical documentation in patient records is of importance for further or future medical care as well as medico-legal purposes. With the current worldwide increase in medical litigation the importance of good clinical note keeping is increasing.

The procedure of endotracheal intubation is practiced worldwide to achieve definitive airway control in emergency Centres. This lifesaving procedure can and has been the subject of medical litigation as well as adversely influenced patient morbidity and mortality. <sup>1</sup> Without adequate medical records the outcome and quality of any procedure performed cannot be proven.

This case review aims to assess the current documentation of endotracheal intubation in the emergency centre of two district level hospitals in the Western Cape.

### **Literature review:**

Review of the relevant Emergency Medicine literature failed to show any studies in South African emergency Centres evaluating note keeping and more specifically note keeping related to intubation. In Perth Western Australia a slight improvement in documentation of specified criteria for endotracheal intubation was achieved in 2005 following an educational program.<sup>2</sup> The Leeds PICU experience showed formal documentation in patient notes (although not defined) to be 64% or two thirds of total during a prospective case review.<sup>3</sup>

In South Africa a small study performed in Cape Town assessing anaesthetic record keeping showed only one third of anaesthetic records were complete and legible using specified criteria.<sup>4</sup>

Anaesthetic record keeping internationally shows a trend towards using electronic format anaesthetic information management systems (AIMS), even with these systems in place record keeping is not 100% complete.<sup>5</sup> Emergency centre doctors generally see more patients per hour in a less

controlled environment and one can assume that note keeping in this group would be poorer than that of the anaesthetists.

Literature comparing the anaesthetist and emergency physician intubation skills and percentage of procedures performed by each abounds. In America responsibility for the acute airway lies with the emergency physician whereas in the United Kingdom it is still viewed to be the anaesthetist's responsibility.<sup>6</sup> In South Africa emergency centre doctors, regardless of their level of skill and training, are primarily responsible for emergency airway management.

Rapid sequence intubation (RSI) is the method of choice when performing emergency centre intubations using a variety of drugs.<sup>7, 8</sup> The Emergency Medicine Society of South Africa (EMSSA) has drafted a guideline for the recommendation and quality maintenance of RSI.<sup>9</sup>

Multiple guidelines to documenting endotracheal intubation in the pre-hospital environment exists, the NEAR (National Emergency Airway Registry) in USA requires completion of specific criteria when managing an emergency airway, this info is then nationally collated and used for statistical analysis and quality improvement.<sup>10</sup> This is the only national registry currently functional internationally. Denmark and Austria both have difficult airway registries.<sup>11, 12</sup>

## **Aims & Objectives**

The aim of this study is to assess the adequacy of current note keeping related to endotracheal intubation in Emergency Centres in Cape Town in terms of clinical and medico-legal criteria. Using this data it is aimed to develop a template to be used to document endotracheal intubation in patient notes in the Western Cape.

## **Methods:**

A retrospective case review of medical records of two secondary hospitals in Cape Town (Victoria and GF Jooste Hospitals.) These hospitals were chosen for the numbers of emergency intubations that occur there and the wide spectrum of medical and trauma cases.

Patient will be identified using the resuscitation room register for the period 1 July to 31 Dec 2008, from which all patients receiving endotracheal intubations will be selected. Only patients 18 years and older intubated in the department will be used for this case review. Patients intubated pre-hospital will be excluded.

Review of the patient records will be performed by the researcher and a data sheet completed.



Chart review will evaluate specific criteria:

- indication
- Drugs and doses used
- Size of endotracheal Tube
- visualization of vocal cords during procedure
- difficulty and number of attempts
- depth of insertion
- securing method,
- confirmation of correct position
- ventilator settings
- complications
- Physician experience level
- Date and time
- Legible physician name

(see Addendum A: Data Sheet)

The names of the patient and the doctor performing the procedure will NOT be included.

A preliminary review has suggested a pickup rate of between 15 and 20 patients per unit per month. This will correlate with a sample size of 240.

Statistical input has been sought and this appears to be adequate.

Data capturing will be performed using MS Excel, and analysed using Statistica version 9 (Statsoft inc. Statistica 2009 (data analysis system.)) A p-value of  $p < 0.05$  will represent statistical significance in hypothesis testing

and 95% confidence intervals will be used to describe unknown parameter estimation.

Data collection will only commence following approval from the Departmental Research Committee and Ethics Committee. Presentation to the Thesis Committee by March 2011

### **Ethics:**

Approval will be requested from the Research Ethics Committee of University of Cape Town.

Permission to access information will be requested from the Superintendents, Heads of Emergency Centres and Heads of Medical Records at Victoria and GF Jooste Hospitals. (Addendum B)

As no patient or healthcare professional personal detail is to be used / divulged consent from each patient will not to be obtained.

All data will be stored in a password protected database by the researcher.

### **Dissemination:**

This study is done for the purpose of obtaining a MMed degree in Emergency Medicine. The findings will be summarised as an article and presented for publication in a peer review journal.

## References:

1. Caplan RA, Posner KL, Ward RJ, Cheney FW. Adverse Respiratory Events in Anesthesia: A Closed Claims Analysis. *Anesthesiology* 1990; 72:828-833.
2. Winton J, Celenza A, Jackson T. Improving documentation of endotracheal intubation in an adult emergency centre. *EMA* 2008; 20:488-493.
3. Walker A, Timperley J, Brown J. Training of pediatricians in emergency intubation with drugs – the Leeds PICU experience. Available from: URL: <http://www.leedsteachinghospitals.com/sites/emibank/clinicians/emerg/documents/picupost.pdf>
4. Raff M, James MFM. An Audit of anaesthetic record keeping. *SAJAA* 2003 Jul: 7-9
5. Driscoll WD, Columbia MA, Peterfreund RA. An observational study of anesthesia record completeness using an anesthesia information management system. *Anaesth Annals* 2007; 104:1454-1461.
6. Nolan J, Clancy M. Editorial IV Airway management in the emergency centre. *BJA* 2002; 88:9-11.
7. Butler JM, Clancy M, Robinson N, Driscoll P. An observational study of emergency centre rapid sequence intubation. *Emerg Med j* 2001; 18:343-348.

8. Sackles JC, Laurin EG, Ranrapaa AA, Panacek EA. Airway management in the emergency centre: A one-year study of 610 tracheal intubations. *Ann Emerg Med* 1998; 30(3): 325-332.
9. Emergency Medicine Society of South Africa. Guidelines on Rapid Sequence Intubation. Available from: URL: <http://www.emssa.org.za>
10. Walls RM. National Emergency Airway Registry. Available from: URL: <http://www.near.edu/>. Accessed 15/10/2009
11. Austrian Difficult Airway/Intubation Registry. Available from: URL: <http://www.adair.at>. Accessed 15/10/2009
12. Afshari A, Khridin V, Knudsen J, Pedersen E, Miran A The Danish Difficult Airway Registry (DDAR). *Ugeskr Laeger* 2005;167(23):2543-4.(Danish language)

## Addendum A

<b>Data Collection Sheet</b>	<b>Yes</b>	<b>No</b>
Hosp. Nr:		
<b>Information documented in patient folder / notes</b>		
Date & Time		
Sex		
GCS		
Was info documented		
Indication for intubation		
Specified:		
Rapid sequence intubation		
Drugs used:		
Induction agent		
Neuromuscular blocker		
No drugs used		
Specified names & dose		
Size of endotracheal tube		
Difficult airway		
Number of attempts		
Visualization of cords described		
Cormack & Lehane Classification		
Additional airway equipment used		

<b>Surgical airway performed</b>		
<b>Depth of insertion - length @ lips/ teeth</b>		
<b>ETT Secured</b>		
<b>Method of securing tube in place</b>		
<b>Tube position confirmed</b>		
<b>5 point auscultation</b>		
<b>CO2 detection: Capnometry / Capnography</b>		
<b>EDD device</b>		
<b>CXR</b>		
<b>Vital signs post intubation</b>		
<b>SaO2</b>		
<b>Ventilator used</b>		
<b>Ventilator settings specified</b>		
<b>Complications of procedure</b>		
<b>Legible physician name</b>		

Notes:

# **Addendum B**

## **Proposed letter to Hospital Management**

The Medical Superintendent

Head Emergency Centre

Head Administration Services

Victoria / GF Jooste Hospital

**RE: An Case review evaluating documenting of endotracheal intubation  
in the Emergency Centres of two secondary Hospitals in the Western  
Cape**

Herewith my application for permission to use medical records to obtain data for completion of my dissertation, MMED in Emergency Medicine degree.

Proposal for this dissertation is to access medical records of all patients intubated in the resuscitation area of the emergency centres of Victoria Hospital / GF Jooste Hospital for the period 1 July 2008 to 31 December 2008. A Data sheet with yes / no answers will be completed to assess the quality of documentation of the above named procedure performed. No healthcare provider or patients details would be used or divulged. The aim of this dissertation is to evaluate current documentation practices and reemphasize the importance of complete medical documentation.

Permission is also requested for the cooperation of the administration personnel in acquiring mentioned folders using the resuscitation register for above stated period.

A written letter of consent regarding this application is required by the dissertation committee of University of Cape Town and would be appreciated.

Thank you for your attention to this matter.

Dr PG Cloete

Emergency Medicine Registrar

0828006705

pgcloete@nashuaisp.co.za

University of Cape Town



# Appendix A

**ENSURE THAT YOU HAVE DOCUMENTED ALL POINTS IN PATIENT'S CASE NOTES**

DATE:

TIME:

ONLY **X** OR

**CONFIRMATION OF ET TUBE PLACEMENT**

Physical measures  
(ensure you have documented visualisation, 5 point auscultation, chest rise, tube size and length at lips)

Continuous End Tidal CO<sub>2</sub> monitoring

CXR


**DOCUMENTATION**

Ensure you have documented time of intubation & by whom (name)

Indication(s) for intubation (clinical parameters) & pre-intubation GCS

Blood gas investigations results before and after intubation

Drugs (& times given) used for Rapid Sequence Induction / non-RSI induction

Whether simple or difficult intubation


**VENTILATOR REQUIREMENTS**

**T-PIECE SHOULD NEVER BE USED FOR TRANSFERS**

Ensure you have documented ventilator settings (Mode/TV/RR/FiO<sub>2</sub>/Airway Pb/PEEP/IE Ratio)

Calculate O<sub>2</sub> requirements according to SOP


**TRAVEL DRUG REQUIREMENTS**

**NEVER MIX MEDICATIONS IN SAME INFUSION BAG / SYRINGE**

Ensure drugs given via infusion (concentration, rate and start time) & boluses (dose and time) are documented

Ensure you have adequate medications (including analgesia and sedation) (infusion and/or repeat boluses) to complete the journey safely, allowing for unexpected delays


**EN ROUTE**

Ensure you have documented departure observations and time

Continuous monitoring including at least ETCO<sub>2</sub>/O<sub>2</sub> Sats/ECG/BP/FiO<sub>2</sub>/GCS

Interventions documented (including time)


**ARRIVAL AT RECEIVING HOSPITAL**

Arrival observations, time & tube position confirmed & documented

All case notes handed over to receiving staff


*EMSSA Practice Guidelines provide advice on recommended practice for emergency centres, emergency personnel and emergency care activities.*

*The information within these papers statements is advice only. EMSSA will not be held liable for clinical outcomes related to these Guidelines.*

## Appendix B

<b>Data Collection Sheet</b>	<b>Yes</b>	<b>No</b>
Hosp. Nr:		
<b>Information documented in patient folder / notes</b>		
Date & Time		
Sex		
GCS		
Was info documented		
Indication for intubation		
Specified:		
Rapid sequence intubation		
Drugs used:		
Induction agent		
Neuromuscular blocker		
No drugs used		
Specified names & dose		
Size of endotracheal tube		
Difficult airway		
Number of attempts		
Visualization of cords described		
Cormack & Lehane Classification		
Additional airway equipment used		

<b>Surgical airway performed</b>		
<b>Depth of insertion - length @ lips/ teeth</b>		
<b>ETT Secured</b>		
<b>Method of securing tube in place</b>		
<b>Tube position confirmed</b>		
<b>5 point auscultation</b>		
<b>CO2 detection: Capnometry / Capnography</b>		
<b>EDD device</b>		
<b>CXR</b>		
<b>Vital signs post intubation</b>		
<b>SaO2</b>		
<b>Ventilator used</b>		
<b>Ventilator settings specified</b>		
<b>Complications of procedure</b>		
<b>Legible physician name</b>		

Notes:

## Appendix C: Emergency Medical Journal Instruction to Authors

### Original articles

For full length accounts of original research, often shorter articles are better.

Additional information may be placed on the web site as a data supplement.

Word count: up to 3000 words.

Illustrations and tables: up to 6.

References: 25.

Peer review: all papers are reviewed by at least one reviewer. If there is uncertainty about acceptance after review, papers are reviewed by the editors.

All material submitted is assumed to be submitted exclusively to the journal unless the contrary is stated. Submissions may be returned to the author for amendment if presented in the incorrect format.

The title page **must** contain the following information:

1. The title.
2. The name, postal address, e-mail, telephone and fax numbers of the corresponding author.
3. The full names, institutions, city and country of all co-authors.
4. Up to five keywords or phrases suitable for use in an index (it is recommended to use MeSH terms).
5. Word count - excluding title page, abstract, references, figures and tables.

The manuscript format must be presented in the following order:

1. Title page
2. Abstract (or summary for case reports)
3. Main text (tables should be in the same format as your article and embedded into the document where the table should be cited; images must be uploaded as separate files)
4. Acknowledgments, Competing interests, Funding
5. Copyright licence statement
6. References
7. Appendices

Do not use the automatic formatting features of your word processor such as endnotes, footnotes, headers, footers, boxes etc. Provide appropriate headings and subheadings as in the journal. We use the following hierarchy: **BOLD CAPS**, **bold lower case**, Plain Text, *Italics*. Cite illustrations in numerical order (fig 1, fig 2 etc) as they are first mentioned in the text. Tables should be in the same format as your article and embedded into the document where the table should be cited. Images **must not** be embedded in the text file but submitted as individual files.

**Statistics:** Statistical analyses must explain the methods used.

**Style:** Abbreviations and symbols must be standard and SI units used throughout except for blood pressure values which are reported in mm Hg.

Acronyms should be used sparingly and fully explained when first used.

**Figures/illustrations:** Black and white images should be saved and supplied as GIF, TIFF, EPS or JPEG files, at a minimum resolution of 300 dpi and an image size of 9 cm across for single column format and 18.5 cm for double column format. Colour images should be saved and supplied as GIF, TIFF, EPS or JPEG files, to a minimum resolution of 600 dpi at an image size of 9 cm across for single column format and 18.5 cm for double column format. Images should be mentioned in the text and figure legends should be listed at the end of the manuscript. During submission, when you upload the figure files please label them as Figure 1, Figure 2, etc. The file label will not appear in the pdf but the order in which the figures uploaded should be sufficient to link them to the correct figure legend for identification. Histograms should be presented in a simple, two-dimensional format, with no background grid.

**Tables:** Tables should be submitted in the same format as your article and embedded into the document where the table should be cited. Tables should be self-explanatory and the data they contain must not be duplicated in the text or figures.

**References:** Authors are responsible for the accuracy of references cited: these should be checked against the original documents before the paper is submitted. It is vital that the references are styled correctly so that they may be hyperlinked.

*In the text:* References must be numbered sequentially as they appear in the text. References cited in figures or tables (or in their legends and footnotes) should be numbered according to the place in the text where that table or figure is first cited. Reference numbers in the text must be given in square brackets immediately after punctuation (with no word spacing) - for example, [6] not [6]. Where more than one reference is cited, separate by a comma - for example, [1, 4, 39]. For sequences of consecutive numbers, give the first and last number of the sequence separated by a hyphen - for example, [22-25]. References provided in this format are translated during the production process to superscript type, which act as hyperlinks from the text to the quoted references in electronic forms of the article.

***In the reference list:*** References must be double spaced (numbered consecutively in the order in which they are mentioned in the text) in the [slightly modified] Vancouver style. Only papers published or in press should be included in the reference list. (Personal communications or unpublished data must be cited in parentheses in the text with the name(s) of the source(s) and the year. Authors should get permission from the source to cite unpublished data.)

**Punctuation of references must follow the [slightly modified]**

**Vancouver style:**

12 Surname AB, Surname CD. Article title. Journal abbreviation.

Year;Vol:Start page-End page.

Use one space only between words up to the year and then no spaces. The journal title should be in italic and abbreviated according to the style of Medline. If the journal is not listed in Medline then it should be written out in full.

University of Cape Town



## References:

1. Murphy BJ. Principles of Good Medical Record Documentation. *J Med Pract Manage.* 2001;Mar/Apr:258-260
2. Medical Protection Society 2010. Keeping Medical Records. Available from: [www.medicalprotection.org/southafrica](http://www.medicalprotection.org/southafrica). Accessed 11/11/2010.
3. Butler JM, Clancy M, Robinson N, Driscoll P. An observational survey of emergency centre rapid sequence intubation. *Emerg Med J.* 2001;18:343–348
4. Divatia JV, Bhowmick K. Complications of Endotracheal Intubation and other airway management procedures. *Indian Jour Anaesth.* 2005;49(4);308-318
5. Roos J, James MFM. Prehospital Endotracheal Intubation Practices by Paramedics in the Provincial Ambulance Service of the Western Cape Province of South Africa [M.MeD Thesis]. Cape Town, University of Cape Town 2006.
6. Cheney F. The American Society of Anesthesiologists Closed Claims Project: what have we learned, how has it affected practice, and how will it affect practice in the future? *Anesthesiology.* 1999; 91:552-556.
7. Beckmann LA, The influence of the current medicolegal climate on New SouthWales anaesthetic practice. *Anaesth Intensive Care.* 2005; 33: 762-767.
8. Case Report Notekeeping Anaesthetics. Don't blame in on the bougie. MPS Casebook 2008; 16:2:24

9. Mavroorou A, Stamatiou G, Koutsias S, Michalodimitrakis E, Vretzakis G, Giannoukas AD. Malpractice issues in modern anaesthesiology. *Eur J Anaesthesiol.* 2007; 24:903-911
10. Adnet F, Lapostolle F, Ricard-Hibon A, et al. Intubating trauma patients before reaching hospital: revisited. *Crit Care.* 2001; 5:290-1
11. Stevenson AGM, Graham CA, Hall R, Korsah P, McGuffie AC. Tracheal Intubation in the emergency department: The Scottish district hospital perspective. *Emerg Med J.* 2007; 24:394–397.
12. Sagarin, MJ, Barton, ED, Chng, YM, Walls, RM. Airway management by US and Canadian emergency medicine residents: a multicenter analysis of more than 6,000 endotracheal intubation attempts. *Ann Emerg Med.* 2005; 46:328.
13. Sakles JC, Laurin EG, Rantapaa AA, Panacek EA. Airway management in the emergency department: a one-year study of 610 tracheal intubations. *Ann Emerg Med.* 1998; 31:325–32.
14. Dufour DG, Larose DL, Clement SC. Rapid sequence intubation in the emergency department. *Emerg Med J.* 1995; 13:705–10.
15. Cowling KM, Chaney WC, Jones CA. American College of Emergency Physicians Policy Compendium 2010 Edition. Available from: <http://www.acep.org>. Accessed 30/09/2010.
16. Emergency Medicine Society of South Africa. Protocol for Rapid Sequence Intubation in Emergency Centres: Adult and paediatric. Available from: URL: <http://emssa.org.za/practice-guidelines>. Accessed 21/11/2010
17. Nolan J, Clancy M. Editorial IV Airway management in the emergency department. *Br J Anaesth.* 2002; 88:9-11.

18. Kovacs G, Law JA, Ross J et al. Acute airway management in the emergency department by non-anesthesiologists. *Can J Anaesth*. 2004; 51:174–80.
19. Walker A, Brenchley J. Survey of the use of rapid sequence induction in the accident and emergency unit. *J Accid Emerg Med*. 2000; 17:95–97
20. Carley SD, Gwinnutt C, Butler J, Sammy I, Driscoll P. Rapid sequence induction in the emergency department: a strategy for failure. *Emerg Med J*. 2002; 19: 109–13.
21. Mackay CA, Terris J, Coats TJ. Prehospital rapid sequence induction by emergency physicians: Is it safe? *Emerg Med J*. 2001; 18:20–24
22. Tayal VS, Riggs RW, Marx JA, Tomaszewky CA, Schneider RE. Rapid-sequence Intubation at an Emergency Medicine Residency: Success Rate and Adverse Events during a Two-year Period. *Acad Emerg Med*. 1999; 6:31-37.
23. Hobgood C, Anantharaman V, Bandiera G, Cameron P, Halperin P, Holliman J, et al. International Federation of Emergency Medicine model curriculum for medical student education in emergency medicine. *Emerg Med Australas*. 2009;21:367-372
24. Winton J, Celenza A, Jackson T. Improving documentation of endotracheal intubation in an adult emergency centre. *Emerg Med Australas*. 2008; 20:488-493.
25. Weisberg M, Cambria B, Farooqui Y, Hahn B, Dazio F, Maniago EM, et al. Pilot study on documentation skills: is there adequate training in emergency medicine residency ? *Emerg Med J*. Published online 23 December 2009.

Available from: <http://www.sciencedirect.com/science/journal>. Accessed 6/10/2010

26. American College of Emergency Physicians Policy Statements. Patient Medical Records in the Emergency centre. *Ann Emerg Med.* 2009; 54(1):143-144.
27. Millard WB. Electronic Health Records: Promises and Realities Part III. *Ann Emerg Med.* 2010;56(4): A19-A25
28. Walker A, Timperley J, Brown J. Training of pediatricians in emergency intubation with drugs – the Leeds PICU experience. Available from: <http://www.leedsteachinghospitals.com/sites/emibank/clinicians/emerg/documents/picupost.pdf>. Accessed 26/10/2010
29. Emergency Medicine Society of South Africa. Practice guidelines Verification of endotracheal tube placement. EM010 Available from: URL: <http://emssa.org.za/practice-guidelines>. Accessed 29/08/2010.
30. Raff M, James MFM. An Audit of anaesthetic record keeping. *SAJAA.* 2003 Jul: 7-9
31. Driscoll WD, Columbia MA, Peterfreund RA. An observational study of anesthesia record completeness using an anesthesia information management system. *Anesth Anal.* 2007; 104:1454-1461.
32. Devitt JH, Rapanos T, Kurrek M, Cohen MM, Shaw M. The Anesthetic Record: Accuracy and completeness. *Can J Anaesth.* 1999; 46(2):122-128.
33. Howell J, Chisholm C, Clark A, Spillane L. Emergency Medicine Resident Documentation: Results of the 1999 American Board of Emergency Medicine In-Training Examination Survey. *Acad Emerg Med.* 2000; 7(10):1135-1138.

34. Wyllie J, Carlo WA. The Role of Carbon Dioxide Detectors for Confirmation of Endotracheal Tube Position. *Clin Perinatol.* 2006; 22(1):111-119
35. Morrison LJ, Deakin CD, Morley PT, Callaway CW, Kerber RE, Kronick SL, et al. Part 8: Advanced Life Support: 2010 International consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science with Treatment Recommendations. *Resuscitation.* 2010;122:S345-S421.
36. Park CS, Ryu JH, Yeon SR, Jeong JW, Cho SJ. Confirmation of endotracheal intubation by combined ultrasonographic methods in the emergency centre. *Emerg Med Australas.* 2009; 21(4) 293-297
37. Weaver B, Lyon M, Blaivas M. Confirmation of Endotracheal Tube Placement after Intubation Using the Ultrasound Sliding Lung Sign. *Acad Emerg Med.* 2006; 13(3) 239–244.
38. Blumenthal D, Tavenner M. The “Meaningful use” Regulation of electronic Health Records. *NEJM* published online July 13, 2010. Available from: <http://www.NEJM.org>. Accessed 30/09/2010
39. Millard WB. Electronic Health Records: Promises and realities, Part I: The digital Sea Change, Ready or Not. *Ann Emerg Med.* 2010; 56(2): 17A–20A.
40. Timmins N. NHS suspends electronic record project. *Financial Times.* April 16, 2010. Available from: <http://www.ft.com/cms/s/0/9c0377b2-498e-11df-906000144feab49a.html>. Accessed 23 October 2010.
41. Millard WB. Electronic Health Records: Promises and realities, Part II: Some Early Voyages in Partially Charted Waters. *Ann Emerg Med.* 2010; 56(3):17A–21A.