Emergency Intubations by Anaesthetists and Emergency Physicians

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Introduction. Early and effective management of the airway is essential in the care of the critically ill patient. Advanced airway interventions may be performed by anaesthetists or suitably trained emergency physicians (EPs) depending on local policies. This study reports on the practice in the emergency department (ED) of a large, urban teaching hospital.

Materials and Methods. This is a prospective, observational study. A proforma was completed for every patient in whom endotracheal intubation was attempted in the ED between 11.01.99 and 05.10.01.

Results. Data were collected on 857 patients. RSI was performed in 434 patients. 252 patients were in non-traumatic cardiac arrest. There were 3 children under 13 years and 41 prehospital intubations performed by EPs. 171 patients were given other combinations of drugs but did not satisfy the criteria for RSI.

Discussion. In this hospital it is common for EP with training and experience to perform advanced airway management, including RSI. The complication rate in the RSI group was higher for EPs. The views and initial intubation success rates of EPs in RSI are similar to those in non-traumatic cardiac arrests, where airway control is almost exclusively undertaken by EPs. A cooperative policy has been developed between Anaesthesia/Critical Care and Accident and Emergency Medicine to increase the training and experience of EPs in airway management.

Rapid Sequence Intubation for Trauma Patients in Scotland

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Objective. Rapid sequence intubation (RSI) is now accepted as the technique of choice for securing the airway in trauma patients who require intubation in the emergency department (ED). This can be performed by an anaesthetist, an intensive care doctor, or a suitably trained and experienced emergency physician (EP). We aimed to identify any differences between anaesthetists and emergency physicians with regard to RSI in trauma patients in Scotland.

Methods. Prospective, multi-centre observational study of RSI in the EDs of seven urban Scottish teaching hospitals which contribute data to the Scottish Trauma Audit Group (STAG) an ongoing national audit of trauma care. Data were collected prospectively on every intubation attempt for two calendar years commencing 11 January 1999. Data included patient's age, sex, indication for intubation, grade and specialty of intubator, laryngoscopic grade, number of intubation attempts, and complications. STAG data (RTS, ISS, operative details, length of stay in ITU) were collected as part of the routine audit in each centre. The datasets were merged and analysed.

Results. 201 STAG patients were identified who had RSI. Patients who were intubated by emergency physicians had a higher Injury Severity Score (median 26 v 25, Mann-Whitney of rankings $P=0.024$) and a lower Revised Trauma Score (median 5.03 v 5.97, Mann-Whitney of rankings $p=0.006$) than those intubated by anaesthetists. Trauma patients in the EP group were more likely to be intubated within 15 minutes (50.6% v 18.9%, $P<0.001$, Chi square). Mortality was 33.7% in the EP group and 27% in the anaesthesia group ($P=0.385$). Although there was no difference in the proportion of Grade I & II views at laryngoscopy between the two groups ($P=0.110$), anaesthetists had a significantly higher first attempt success rate than emergency physicians (89.2% v 74.2%, $P=0.010$, Chi square). There was no difference in observed complications (10 patients in the EP group and 12 patients in the anaesthesia group, $P=1.0$, Chi square).

Conclusion. Trauma patients undergoing RSI performed by emergency physicians in this study were more severely injured, had more physiological derangement, and had a similar mortality compared with those intubated by anaesthetists. In addition, a higher proportion was intubated within 15 minutes. Anaesthetists have higher first attempt success rates for intubation.

— Session 2A —

Utstein Symposium on Patient Safety, Simulation, and Medical Education in Trauma and Critical Care (Part II)

Part C. Simulation in Medical Education

Why Use Simulation in Medical Education?

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[abstract not available]

How the Use of Medical Simulators Can Improve Airway Management

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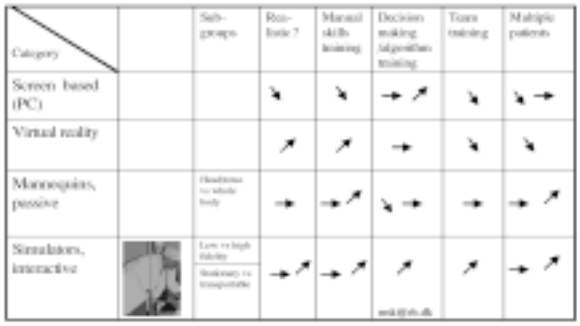
Learning objective: *To explore the distinct strengths and weaknesses of various airway simulators.*

What is the documented effect of training on airway simulators?

1) In many publications, the parameter reported is the participants' own subjective finding that simulator training is useful, including the observation from expert participants that they gained insight in their own performance under stress.
2) Better airway management-performance on the simulator itself. Certain skills (for example, face mask ventilation, placement endotracheal tube, laryngeal mask airway, Combitube, and retrograde intubation) can be learned on simple airway mannequins. The performance of the skills are afterwards evaluated on the same mannequin. Mannequins are also used to study the feasibility of already known procedures in unusual surroundings, for example, weightlessness.
3) Better airway management performance in patients. When combining simulator training and didactic training, emergency medicine technicians were taught endotracheal intubation and the performances evaluated both in the simulator and in real emergency patients. The EMTs were able to learn endotracheal intubation but the failure rate in the clinical setting was unacceptably high. A virtual reality (VR) simulator for bronchoscopy has been validated against the performances of novices and intermediate and expert bronchoscopists. The simulator was able to distinguish the performances by these three groups. After this validation, new trainees were randomised to train either on the VR simulator or have conventional training. After the training, the first group performed best both on the simulator and on their first real patients.
4) No studies were found that were able to show decreased morbidity or mortality as an effect of training on airway simulators.

The different types of medical simulators relevant for airway management can be divided into the categories shown in the table. The strengths and weaknesses of the different categories are indicated.

Airway Simulators by Category, Stengths and Weaknesses.



Airway simulators are convenient for many airway-training purposes; for some purposes they can even be essential:

1) Recognition and management of rare life threatening situations, where both skill and knowledge are necessary, can only be trained using some kind of simulation. An obvious example is the "cannot intubate/cannot ventilate" situation.
2) Some airway management skills may be used so rarely that simulation is necessary to acquire and maintain them. This could be the case for skills such as cricothyroidotomy, retrograde intubation, and placement of a Combitube.

Pitfalls. Airway simulators are strong learning tools and thus have the potential for encouraging inappropriate behaviour in the trainees. If, for example, a simulator scenario is misconstructed in such a way that the simulated patient is saved by means of an inappropriate technique, this technique may become the trainees' response in a real-life situation. This illustrates the need for an expert to guide the simulator session or at least for debriefing afterwards. Judging clinical competence from performance on simulators may give an overoptimistic estimate of real-life performance.[1]

Drawbacks. Some forms of airway simulator training are extremely demanding concerning manpower because of the need for instructors, technicians, and even actors. Airway pathology is often badly presented in the simulators. The realism of most simulators is not evaluated. Most simulators don't bleed, don't get oedema, and don't move while coughing.

What Can We Learn from the Military Use of Training Simulators?

Howard Champion, Bethesda, Maryland, USA

[abstract not available]

Defining and Assessing Professional Competence Using Debriefing and Simulation

Ulrik Juul Christensen, Copenhagen, Denmark

[abstract not available]

Video Analysis to Develop Best Trauma Practices

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Learning objective: *To discuss results of video recordings of trauma resuscitation and to describe the utility of such analysis for improvement of trauma team performance and trauma care working environments.*

Latent system failures and non-optimum team performance have an adverse effect on trauma patient outcome. Video recording in trauma centers can determine best practices for trauma patient safety and team training.

Methods. Video recordings of tracheal intubation and chest tube insertion were obtained from ceiling-mounted cameras in a trauma resuscitation unit. Video analysis used a task analysis template and aggregated data across multiple performances of the same task at two levels of task urgency. In addition, comparison was made of three types of self-reports of trauma team performance deficiencies with events identified through video analysis. Critical incident analysis was used to review two unusual video recordings.

Results. More high-priority tasks were omitted in emergency than elective tracheal intubation. Video analysis of chest tube insertion identified failures of adequate skin preparation, small peri-incision drapes, and lack of universal precautions as major sources of contamination. None of the performance deficiencies identified by video analysis were in the quality assurance reports, 2 of 28 were on the anesthesia record, and 5 were noted in a research questionnaire. Video records of individual critical incidents identified team coordination failures and need for training.

Discussion. Video provides a permanent source document that can be reviewed by multiple analysts. Multiple uses of video recording are reported to improve ergonomic, behavioral, and safety performance of teams in dynamic workplaces such as trauma resuscitation. Prototypical task sequences with the assistance of a core group of trauma care experts can allow extraction of quantitative data from video recordings.

Conclusion. Video recording and task analysis can be used to promote best practice performance in dynamic, risky, and complex medical work places such as a trauma center.

Simulation Based Medical Education: Is There Evidence That Simulation Can Reduce Medical Errors and Improve Patient Safety?

Amitai Ziv, Tel Aviv, Israel

[abstract not available]

Use of the Internet to Improve Trauma Care: An Update from *www.trauma.org*

Karim Brohi, Director, trauma.org, Royal London Hospital, London, UK

Learning objectives: *To describe the genesis and evolution of trauma on the Internet, to discuss how the Internet impacts on global trauma care, and to identify some future applications of the medium.*

The Internet has changed the way much of the world communicates. Near-instantaneous global interaction and a planet-sized distributed information database have allowed the Internet to penetrate areas where textbooks, journals, and conferences cannot.

There are many reasons why the Internet has become such a potent method of communication during its brief history. Primarily, it is the invisible social network aspect of the Internet that makes it so different from broadcast media. People from either ends of the planet, both geographically and economically, can find and communicate with each other. Communities spring up based not on physical location but on interests and concerns. We are living in a global village.

Trauma is a worldwide, multidisciplinary disease and is therefore highly suited to using the Internet as a medium for communication and education. The multispecialty, multinational discussions and case conferences that take place on the Internet are difficult, if not impossible, to recreate in a physical location.

Using the Internet as an education tool allows the rapid, inexpensive dissemination of guidelines, protocols, latest research, and opinions. Areas where textbooks or journals are impossible to find can now have instant access to Medline, textbooks, and Internet-only education tools.

The quality of information provided on the Internet is an issue. There is little peer review and much vanity publishing. A lot of the information carries no details of authorship, date of publication, references, or disclosure of conflicts of interest. This problem has been recognised by several organisations, and some Web sites now subject themselves to internal and external audit of the quality of information provided on their pages.

Trauma.org, founded in 1995, was one of the first medical specialty sites on the Internet. It now serves 900,000 pages of information to 80,000 users each month. The e-mail discussion group has about 1600 members and exchanges more than 3000 messages per year. It has since been joined by several other trauma-related Web sites from specialty associations and various trauma centres around the world.

The site carries several innovative features such as interactive trauma simulations, global databases trauma fellowships and medical student electives, and a database of educational trauma images for download and use in presentations.

In the future, the Internet will become further integrated with all aspects of trauma care. Coordination, management, and communication within local, regional, and national trauma networks are ideally suited to the Internet. New distributed trauma registries will combine with educational resources and patient management systems. Multicentre research trials will be coordinated via secure sites. Published research will bear little resemblance to the print journals available today. Wireless access will take the benefits of the Internet to the prehospital environment. The ultimate applications of the medium have yet to be discovered.

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Trauma Nurse Training: TNCC, ENPC, ATNC, or ATCN? More Than Just a Difference in Names?

Lisa Hadfield-Law, Oxfordshire, UK

[abstract not available]

— Session 2B —

Symposium on Living with the Trauma Deaths

When Children Die Suddenly and Unexpectedly: A Study of the Parents' Grief Reactions

Leif Jon Paulsen
Stavanger, Norway

"Life–a prison with walls made of loss and mourning"

Learning objectives: *To discuss parental reaction to the death of a child and to understand the need for and use of coping mechanisms in this devastating situation.*

The results of a survey among eight couples and one single parent in the middle phase of adulthood are presented. These parents all lost young adult children to sudden, unexpected death. A fairly broad presentation of the parents' own descriptions of their grief is given. Their mourning periods varied from 9 months to 8 years. The author's findings imply that the mourning process for this group of people will last for the rest of their lives. However, they will gradually adapt to the new situation. The article questions the accepted description of grief as a process limited in time and passing through stages. The author claims that a crucial element of the mourning process is to preserve an inner picture of the deceased. The presentation also touches upon the implications of such bereavement on religious and existential questions.

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How Do We Cope with The Trauma Deaths? The Nurse Perspective

Kerstin Sluys
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[abstract not available]

Colleague Support–A Report from a Project Aimed at Helping the Ambulance Staff in South Rogaland

Arne Ove Østebrøt
Stavanger, Norway

[abstract not available]

Ethical Aspects of Brain Death and Organ Donation

Dr. Anne J. Sutcliffe
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Learning objectives: *1) To appreciate how medical definitions of death are not easily reconciled with religious and cultural definitions, 2) to recognize the importance of cadaveric organ donation in the treatment of end stage heart, renal, and liver disease, 3) to review methods of discussing death and organ donation and identify some that appear to be best accepted*

- One donor can save the lives of 10 other people and can improve the quality of life for many others.
- In the UK, renal patients undergo most transplants but despite this the waiting list for all organs continues to grow.
- In Europe, Spain averages 33 donors per million population. Most other countries average only 10 to 15 donors. For each donor, approximately three solid organs are used per donor and this figure is common to all countries.
- In the UK, the criteria for diagnosing brain stem death involve meeting preconditions that ensure the patient is in an irreversible apnoeic coma followed by simple bedside tests of cranial nerves and demonstration of apnoea. These criteria are unique to the UK. Other countries have their own methods of diagnosis and sometimes require confirmatory tests. This illustrates that even the medical profession is not united on the diagnosis of medical brain death.
- It is not universally agreed outside medicine whether death implies death of the organism as a whole or death of the whole organism. Nor is it agreed that death of the brain equates to traditional cardiorespiratory death.
- These issues are further complicated by the fact that the body dies cell by cell. Put simply, death is a physiological process, not an event. Thus we can say that death has occurred but pinpointing the time of death is impossible without an adequate medical definition.
- Perhaps the most useful definition of death is "the irreversible cessation of all *integrated* functioning of the human organism as a whole, mental or physical."
- Were this definition to be accepted world wide, the literature would not contain articles describing seizures in 10% and respiratory arrest in 4% of organ donors! Nor would anaesthesia be advocated for donors during organ retrieval.
- Ideally, the diagnosis of death should be separated form the issue of organ donation.
- Clarification is also needed on who may give consent for donation, how consent should be given, and who has the greatest success in obtaining agreement for donation.
- Another ethical issue that has yet to be debated is the right of donors to specify who may and may not receive the organs.
- A cultural problem is the relative reluctance of some groups to donate when many of their number need organs and are either denied them or have greater rejection rates because of genetic differences between them and the donor pool.

Further Reading

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- Internet searches using the terms *brain death* and *organ donation* will provide a vast array of information on cultural and religious view across the world and details of donation rates and transplantation outcome.

How Do We Cope with the Trauma Deaths? Psychological Reactions and Coping Strategies

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Learning objective: *To describe the variety of psychological reactions in trauma care providers and describe coping mechanisms that can be used to manage these reactions in a professional way.*

Most trauma deaths occur immediately in the prehospital period and during the first hours after admission to the hospital. A considerable number of immediate survivors die because of complications to the primary injuries after a period in the ICU. We as trauma care