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EDITORIAL

This issue of the Clinical Communiqué describes two cases of patient deterioration that resulted in the activation of a hospital Medical Emergency Team (MET). The concept of a MET system was first described in a New South Wales Hospital in 1995 with the goal of improving patient outcomes through early recognition and response to clinical deterioration. The system allowed for staff to call a MET, consisting of doctors and nurses trained in advanced life support, on the basis of clinical concern alone, or on the presence of abnormal physiological variables. It was thought that through prompt intervention and medical treatment, cardiac arrest, unplanned admissions to the intensive care unit (ICU), and death, could be prevented. By 2005, approximately 60% of ICU-equipped hospitals in Australia and New Zealand reported having introduced a MET service.

Now, 20 years later, most health services nationally and internationally have implemented their own versions of the MET system, with their own sets of training guidelines, protocols and practices. Despite the ubiquity of MET systems, we are still learning, and as these cases highlight, we can still do better.

In many ways, the principles behind the MET system are applicable to all healthcare environments, not just acute hospital settings. Leadership, decision-making, communication and task allocation are all critical to the effective performance of a team responding to an emergency, whether that be in an operating theatre, a hospital ward, an outpatient clinic, or community health centres.

Included in this issue is a special feature from the Chair of the Coronial Council of Victoria, Dr Katherine McGrath, who provides valuable insight into the experiences of witnesses called to give evidence at inquest. The expert commentary from Dr Antony Tobin, a senior intensivist and expert in the effectiveness of MET and tracheostomy review teams, details the components of the MET model and the necessary skills and training required to ensure optimal team performance.

This Communiqué marks the completion of our first year back in publication and we are looking forward to presenting our next set of quarterly issues to our readers. We strive to present cases that bring about reflection, communication, and most importantly, changes in practice to improve patient safety. As promised in our first issue, we will continue to evolve and respond to feedback, to provide a resource that challenges, stimulates and educates. To do this, we have designed a short survey that will be sent to all our subscribers in July. Please spare a few moments of your time to complete the survey so that we can hear your views, experiences and suggestions. Once finalised, we will be publishing the results of the survey for our readers.

ACKNOWLEDGEMENTS

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All cases that are discussed in the Clinical Communiqué are public documents. A document becomes public once the coronial investigation process has been completed and the case is closed. We have made every attempt to ensure that individuals and organizations are de-identified. The views and conclusions are those of the authors and do not necessarily represent those of Victorian Managed Insurance Authority, the individual Coroner, the Coroners Court, Department of Health, Department of Forensic Medicine, Victorian Institute of Forensic Medicine or Monash University. If you would like to examine the case in greater detail, please contact us and we will provide the relevant website for the Coroners Court jurisdiction.

FEEDBACK

The editorial team is keen to receive feedback about this communication especially in relation to changes in clinical practice. Please email your comments, questions and suggestions to: clinical.comunique@vifm.org

THE EXPERIENCE OF WITNESSES CALLED BY THE CORONERS COURT

Dr Katherine McGrath
Chair, Coronial Council of Victoria

In 2008, the Victorian government established the Coronial Council to advise the Attorney General on ways to improve the process of death reviews undertaken by the Coroners Court to ensure it met community expectations.

One of the first issues brought to the attention of the Council was the anxiety described by those people who, through their work, end up participating in court proceedings as a witness because they were involved with the deceased person at the end of their life, or in the investigation of the circumstances of the death. They may also be called as expert witnesses from time to time. On all these occasions, participating in an inquest is a stressful experience, especially if it is for the first time. The Council was asked to consider how best to support those staff from health, emergency, and police services that may experience this stress.

A survey was commissioned from Sweeney Research who invited staff from these organisations to volunteer to keep an interactive journal and undergo an in-depth interview to record their experiences and views on the process. Staff from Emergency Services (1), Medical (7), Mental Health (3), Police (8) and Social Services (6) participated in either or both modalities. The results from this survey are discussed below.

The emotional impact of being asked to be a witness at a Coronial Inquiry was greater if the person had been involved with the deceased before his/her death. Respondents often felt that the process did not recognise the grief of the witness who, in addition to their interaction with the deceased before death, may have had a long professional relationship with them, and was then also dealing with grief at the loss of their relationship. This was especially so if the actions of the witness were under scrutiny as having potentially contributed to the death.

Respondents also stated that they often felt that the questioning at a Coronial Inquiry was unnecessarily aggressive and lacking in respect for the manifold stresses being felt by the witness. Lack of knowledge of what to expect when attending the court was also a significant factor in the stress of professional witnesses. These issues were compounded if the inquest was occurring in a small community where the case was widely known and the people involved as witnesses were also publically known to be participating.

Witnesses also placed a lot of pressure on themselves, and were worried about the impact of their testimony. Stating the facts may be very upsetting for relatives, but not stating them may lead to the wrong conclusions being drawn.

Some of the larger organisations, had internal processes in place to support staff attending for the first time and these were greatly appreciated by staff. Respondents stated that court volunteers at the court whose role it was to support families and witnesses were not always professional in their approach.

Respondents stated that they wanted to know more about what to expect in the Court, and where their role fitted in to the coronial process. They also wanted to know when the Court no longer required them, so that they could cease worrying about the event.

As a response to these concerns, the Coronial Council and Coroners Court developed a series of interactive videos to give more information about how the Court operates and what is expected of those called as witnesses. The information is tailored to each of the various reasons why a person may be called e.g. as a police witness, as an expert witness, as a witness to aspects of the deceased person's life and care that may be relevant to the inquest. These videos are available on the Coroners Court website at:

<http://www.coronerscourt.vic.gov.au/home/about+us/virtual+tour/>

The stress of participating in an inquest should not be underestimated. Large organisations such as hospitals, the police and emergency services have people on staff with expert knowledge of the Coroners Court process who can assist employees in knowing what to expect. In health services, these are the Directors of Medical Services or Corporate counsel. In the police force and emergency services there are senior officers who have this expertise. Medical indemnity organisations also provide support and advice for medical practitioners involved in coronial inquests.

We encourage anyone who is called as a witness to view these videos and ask for advice from the relevant senior officers in their organisations in order to prepare for an inquest. They can help you prepare any material you need to refresh your memory of the relevant events. Knowing what to expect will reduce the stress of the process.

CASE #1 FAMILIARITY IS KEY

Case Number: 203/2011 ACT
Case Précis Author:
Dr Nicola Cunningham FACEM

CLINICAL SUMMARY

Mrs ST was a 55 year old female with chronic renal failure, diabetes mellitus, coronary artery disease and obesity. She had been treated for some time with peritoneal dialysis but a decision was made to commence her on haemodialysis (HD).

Mrs ST attended hospital as planned for the first day of HD and a tunnelled dialysis line was inserted. HD commenced at approximately 3:10pm and five minutes later she complained of abdominal pain and was given paracetamol. Soon after, she complained of breathlessness and began vomiting. Her blood pressure increased rapidly and her condition worsened.

It was determined that her cerebral injury was significantly contributed to by the failure to provide oxygen in a timely manner.

A Medical Emergency Team (MET) call was activated at 4:10pm. Once the team arrived there were 12 to 18 people around Mrs ST's bedside. They included Dr D (intensive care registrar), Dr B (intensive care resident), RN A (MET nurse), RN S (ward nurse), Dr T (anaesthetic registrar), and a wardsman conveying the MET trolley. Bag mask ventilation commenced at 4:20pm, drugs to facilitate intubation were administered at 4:25pm, and the anaesthetic registrar was instructed to intubate Mrs ST by Dr D at approximately 4:30pm. RN A attached a colorimetric carbon dioxide (CO₂) detector (a device that provides semi-quantitative end-tidal CO₂ monitoring), and Drs D and B confirmed on auscultation that the endotracheal tube was in the correct position. End-tidal carbon dioxide (ETCO₂) data was not immediately available.

The end-tidal capnograph was attached some time later and required additional time for warming up and calibration (this device provides a waveform and digital readings of ETCO₂ and is considered the quantitative 'gold standard' for monitoring ETCO₂).

Dr T was a first year anaesthetic registrar who had no prior experience in emergency intubations, and had not received specific training in MET roles.

Following intubation, Mrs ST deteriorated further. Cardiopulmonary resuscitation was commenced at 4:35pm, and RN A called the intensive care unit (ICU) for more help.

Dr N, a senior ICU registrar arrived 5 minutes later and noted the absence of both an oxygen saturation trace and an ETCO₂ waveform. The anaesthetic registrar confirmed again that the tube was in the correct position so Dr N then asked Dr D to review the tube's position.

Dr D found that the tube was misplaced in the oesophagus and re-intubated Mrs ST at approximately 4:49pm. Spontaneous circulation was restored and Mrs ST was transferred to the ICU.

Over the next ten days, Mrs ST did not make any recovery and was found to have suffered severe and irreversible hypoxic cerebral injury. In consultation with Mrs ST's family, a decision was made to withdraw treatment.

PATHOLOGY

Mrs ST died as a result of hypoxic ischaemic encephalopathy. It was determined that her cerebral injury was significantly contributed to by the failure to provide oxygen in a timely manner. This was as a result of inadvertent oesophageal intubation during the provision of emergency life support, which was required following an adverse response to haemodialysis.

INVESTIGATION

Mrs ST's death was reported to the Coroner by the hospital. The family expressed concerns regarding the care that Mrs ST received on the day of her hospital admission and an inquest was held by the Coroner to investigate those concerns.

Each of the staff members involved in the MET response and the care of Mrs ST were called to provide statements to the Coroner. The director of the ICU was requested by the Coroner to provide an overview of the MET system.

Dr D was experienced in emergency calls but had been employed at the hospital for less than a month.

He had not been orientated to the equipment on the MET trolley, and was not aware that the defibrillator on the trolley had a CO₂ monitor. He described Mrs ST as being difficult to intubate due to her body habitus, her reduced level of consciousness, and the fact that she was vomiting.

The nurses stated they had noted the lack of colour change on the calorimetric CO₂ detector and that Mrs ST's abdomen was distending, but may not have specifically raised their concerns with the doctors.

Dr T was a first year anaesthetic registrar who had no prior experience in emergency intubations, and had not received specific training in MET roles. She explained that she did not know the other doctors in the room and had assumed Dr D was in charge. She took on the role of airway doctor but there was no discussion about who was most qualified to perform this emergency intubation. Dr T outlined the steps she took in intubating Mrs ST, which included using a bougie when she had difficulty viewing the vocal cords, and having to call several times without response, for the endotracheal tube to be railroaded over the bougie.

CASE #1 FAMILIARITY IS KEY (Continued)

She then had to remove the laryngoscope in order to railroad the tube over the bougie herself losing the opportunity to see the tube pass through the vocal cords.

The nurses stated they had noted the lack of colour change on the calorimetric CO2 detector and that Mrs ST's abdomen was distending, but may not have specifically raised their concerns with the doctors. The false positive reassurances provided by the doctors about the placement of the tube, and the lack of familiarity with the MET trolley may have acted as distractors from the contrary or absent clinical signs and CO2 readings. The environment was described as noisy and chaotic, which may have contributed to the lack of assistance provided to the anaesthetic registrar, the lack of assertiveness by the team leader, and the failure by all staff to communicate their concerns clearly and effectively to each other.

CORONER'S FINDINGS

In her finding, the Coroner referred to the Medical Board of Australia's Code of Conduct, citing that good medical practice involves - *"Communicating clearly, effectively, respectfully and promptly with other doctors and healthcare professionals caring for the patient. Advocating for a clear delineation of roles and responsibilities, including that there is a recognised team leader or coordinator"*.

The environment was described as noisy and chaotic, which may have contributed to the lack of assistance provided to the anaesthetic registrar, the lack of assertiveness by the team leader, and the failure by all staff to communicate their concerns clearly and effectively to each other.

The Coroner noted that although Mrs ST had already been suffering breathing difficulties for about 45 minutes when she was first intubated, the misplacement of the endotracheal tube for a further 20 minutes would have significantly contributed to her hypoxic state.

The Coroner made two recommendations to the hospital:

1. That they introduce a requirement that all staff responding to MET calls must complete a document annually that indicates they are familiar with the MET call policies, procedures and equipment.
2. That the following form of introduction on arrival at a medical emergency be incorporated into the MET call policies, *"my name is...; I am the (indicate role); I have (x) years/months experience in the role; who is in charge of this response? / I am in charge of this response."*

Subsequent to the event, the hospital installed a new ETCO2 monitor on the MET trolley that did not require a warm up or calibration period.

The allocation of roles and responsibilities in a MET call should be dependent on the expertise of the staff attending.

The hospital also formalised a policy on responders' roles and responsibilities in MET calls, and introduced a log to ensure that a checklist of the MET trolley equipment was made regularly.

EDITOR'S COMMENTS

MET calls are chaotic and stressful events, made even more so by lack of training and preparation. The allocation of roles and responsibilities in a MET call should be dependent on the expertise of the staff attending. Clear and assertive communication at the bedside enables immediate identification of a team leader and assessment of available human resources thereby facilitating appropriate assignment of tasks to team members. When faced with a rapidly deteriorating patient, it is vital that staff are familiar with their roles, their skills and limitations, and the equipment available to them, so that they can accurately perform their tasks, and recognise any issues as soon as they arise.

RESOURCES

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KEYWORDS

MET, airway, communication, equipment, intubation, capnography

CASE #2 IN DEFENCE OF PROTOCOLS

Case Number: 2007/152 QLD
Case Précis Author:
Carmel Young RN

CLINICAL SUMMARY

Mrs YD was a 75 year old female with a past medical history that included hypertension and renal impairment. She presented to a small rural hospital with flu-like symptoms and diarrhoea, and was diagnosed with rapid atrial fibrillation and respiratory distress secondary to pneumonia. Mrs YD was intubated and transferred by air ambulance to a hospital with an intensive care unit (ICU). Eight days later, after two failed attempts to extubate her, the senior doctor on duty (Dr H) decided to perform a percutaneous tracheostomy.

The junior doctor assisting Dr H had observed tracheostomies but had not performed one. It was decided by Dr H that this would be a good chance for him to perform the procedure under the guidance of a senior doctor.

Mrs YD's death was reported to the Coroner as an unexpected outcome of medical procedure under the Coroner's Act.

During the procedure the junior doctor was unable to verify the placement of the tracheostomy tube and there was some bleeding so it was decided to remove the tube and patch the surgical wound. Dr H took over the tracheostomy procedure with further attempts to place the tube that were unsuccessful. Mrs YD desaturated and a MET call was made. Mrs YD died two days later.

PATHOLOGY

The cause of death on autopsy was septicaemia secondary to pneumonia with evidence of hypoxic brain damage. The forensic pathologist stated that the procedure may have shortened Mrs YD's life, but did not directly cause her death.

INVESTIGATION

Mrs YD's death was reported to the Coroner as an unexpected outcome of medical procedure under the Coroner's Act.

The doctors and nurses involved in the care of Mrs YD were called to give evidence at the inquest. The Coroner was told that the nurses had printed a tracheostomy protocol and handed it to Dr H. The protocol required two consultants and the use of a bronchoscope to perform the procedure.

Another relevant issue was that the procedure was attempted on a Sunday afternoon when senior staffing was limited.

Dr H was a locum intensivist who felt that a tracheostomy would improve Mrs YD's chance of recovery, and wanted to perform it before leaving his rotation the following day. Dr H reassured the nursing staff that he knew what he was doing and that he often performed tracheostomies on his own with the aid of one nurse. He was not aware of the terms of the protocol and did not refer to the document at any time.

It became evident during the inquest that there were a number of factors that affected the chain of events. Neither of the medical staff had received orientation to the hospital or unit. It was identified prior to the procedure that the ETCO₂ monitor was not working. The ICU bronchoscope was not functional and the borrowed bronchoscope could not be attached to the viewing screen. Dr H made the decision to proceed without the use of the equipment. The procedure had not been abandoned when difficulties were encountered, despite suggestions by the nurses to do so. Another relevant issue was that the procedure was attempted on a Sunday afternoon when senior staffing was limited.

An expert opinion was obtained from a senior intensive care specialist who considered the decision for a tracheostomy to be appropriate but questioned the need to do it on a weekend.

The expert also described the use of a bronchoscope as common practice for tracheostomies and suggested that a serious outcome was less likely to have occurred had the protocol been followed.

The Area Health Service conducted a Root Cause Analysis and many of the recommendations made by the investigating team were agreed with by the expert witness and reiterated by the coroner.

CORONER'S FINDINGS

The coroner recommended that:

1. Formal orientation for locum doctors be conducted prior to commencing duty, including awareness of procedures and policies for their units, and an understanding that they are expected to adhere to them.
2. The Percutaneous Tracheostomy Protocol requires the use of a fibre-optic bronchoscope (with video screen).
3. A working ETCO₂ monitor and bronchoscope are available in the ICU.
4. Percutaneous tracheostomies be performed in normal working hours, unless urgent.
5. An escalation process regarding treatment concerns for all staff in ICU is developed including graded assertiveness training.
6. The professional standards published by the relevant Colleges are adhered to in performance of tracheostomies.
7. That where best practice policies have been developed, the Area Health Service ensure they are shared to doctors in all Area Hospitals for consideration and adoption in order to promote consistent safe practice.

KEYWORDS

Tracheostomy, MET, equipment, protocol, communication, orientation

EXPERT COMMENTARY

HOW TO MAKE A BETTER MEDICAL EMERGENCY TEAM?

Dr. Antony Tobin
Deputy Director of Intensive Care
St Vincent's Hospital Melbourne,
Australia

Medical emergency teams (MET) were introduced to provide prompt review of deteriorating patients with the aim of averting cardiac arrest. The system relies on an afferent limb, generally nurses and junior doctors on the wards, to identify deterioration and call for assistance and an efferent limb composed of a team that responds, assesses and manages the patient. The responding team varies between institutions but generally contains a critical care trained nurse and doctor and may also include a medical registrar and anaesthetic registrar. Collection and analysis of MET data informs feedback for both limbs, improving prevention strategies and team performance.

Leadership and teamwork are important in responding and managing emergencies. These important aspects of care are often referred to as non-technical skills and comprise interpersonal and cognitive attributes that together with clinical skills are important for team performance. Categories of non-technical skills that are important in emergency management include task management, situational awareness and decision-making.

Simulation training has been shown to improve non-technical skills during resuscitation and can improve care delivery and simulated patient outcomes.

MET team-members are chosen on the basis of clinical skills and training but for the main, little attention is given to non-technical skills and team training. Given the nature of hospital shift work, actual team members may vary from shift to shift making non-technical skills even more important if the team is to perform cohesively at every call.

The case of the unrecognised oesophageal intubation leading to hypoxic brain injury highlights the importance of non-technical skills for team function.

There are errors of leadership (failure to create order, to clearly identify team members, to delegate tasks and lack of situational awareness) and errors of preparation (no end tidal CO₂) and of teamwork (assistance during use of the bougie, feeling unable to speak up about the possible oesophageal intubation).

Similar problems were present in the case of the failed tracheostomy.

Staff change on a regular basis in hospitals, this training needs to be provided on an ongoing systematic basis.

Simulation training has been shown to improve non-technical skills during resuscitation and can improve care delivery and simulated patient outcomes. Scenario training can teach team skills such as leadership and communication and can also be used to familiarise team members with equipment and local protocols. In addition, cognitive aids like checklists for emergency procedures on resuscitation trolleys can improve performance and may provide prompts for team members to question practices that deviate from guidelines/protocols.

MET teams have become an integral component of responding to deterioration and are associated with improved patient outcomes. However, training that ensures that both the teams' technical and non-technical skills are adequate is needed and as staff change on a regular basis in hospitals, this training needs to be provided on an ongoing systematic basis.

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