OPINION

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Removal of Invasive Devices from Deceased Persons: Forensic implications for Paramedics
– a Victorian perspective.

*Interview with Professor Stephen Cordner on 11th May 2005,
followed by responses from Dr. Hugh Grantham and Dr. Garry Wilkes*

Brett Williams

Professor Cordner is Professor of forensic medicine at Monash University Institutes of Health and Director of the [Victorian Institute of Forensic Medicine](#).

His work in the area of forensic medicine and human rights has seen him take tours of duty in East Timor and Kosovo, as well as a year-long stint consulting to the International Committee of the Red Cross in Geneva.

The following interview was conducted to invite Professor Cordner's professional opinion in relation to practices and implications with respect to the removal of invasive clinical devices from deceased persons, as they currently apply to paramedics of Metropolitan Ambulance Service in Melbourne, and Rural Ambulance Victoria.

BW: Could you discuss your role at the Victorian Institute of Forensic Medicine?

SC: *I am the Director of the Institute. My background is that of a forensic pathologist which means I am a medical specialist if you like, a pathologist, but with a particular interest in forensic pathology which is pathology applied to the needs of the law. That's really what we're talking about today. We have 6 or 7 pathologists here and we are involved with the medical investigation of about 3,500 bodies that are admitted to this institution every year.*

BW: Could you expand which VIFM clinical boundaries cross into the prehospital arena and vice versa.

SC: *Probably about half of the deaths either come from hospitals or have had some form of emergency medical or health care. So we need to have a very good understanding of the medical and related history of the deceased if we are to do our job properly. A lot of people think forensic pathology and autopsy should happen in a vacuum; that you shouldn't be sent off in a particular direction by knowledge of the history. Well that is a complete misconception. You need to know as much as you can possibly know about the medical and circumstantial history of the death so that the issues are clear. The autopsy then becomes a problem-solving exercise, the time to make those observations necessary to answer the questions that are particular to that death. If we don't have the information, both medical and circumstantial, we might miss the questions that need answers and we might not make the*

observations that are necessary. It is really important that we have all the information we can get.

We're about to talk about devices that ambulance paramedics use. However, in the middle of an autopsy the other day I found myself ringing the ambulance paramedic. There was a possibility of a homicide, and at the autopsy there was quite a lot of blood in the airway, and I wanted to know whether the blood had been there when the ambulance paramedic attended, because that would have been an important indicator in the person's demise. As it turned out the ambulance paramedic said there was not anything in the airway when he got there, and here I am at the autopsy with a lot of blood in his airway. So if the ambulance paramedic was right, and I have no reason to suspect that he isn't, then the blood has got there afterwards which means some sort of passive, post mortem process which is perfectly acceptable. That it was not active inhalation of blood was a very important conclusion in this particular case. I was really glad I rang the ambulance paramedic because it gave me the information and insight I required at that time to make my conclusions. In a death that sort of thing may not necessarily be noted. I would say that you would not want to underestimate the significance of any observation you might make, in particular, the state of the airway at the time you attend somebody who is dead or subsequently dies, whether there is blood or aspirated gastric content actually in the airway and how far down you can see it may well be important.

BW: Can you please expand on the policy in Victoria and outline the rationale of leaving invasive devices such as ETT's insitu in deceased victims.

SC: As I mentioned before, we need to have as much information as possible, and that includes the use of those devices. Those devices can cause injuries and if they're not present at autopsy we might be scratching around as to why the injury was caused. Then we'll think that maybe it was caused at resuscitation and in that case why isn't the device still there. It has to be said that on occasions the wrong positioning of an endotracheal tube might be a relevant factor although it would be rare for us to be able to say that it is in fact a relevant factor. In other words, was this person alive and talking when you put the tube down the wrong way, and if they were, that's probably not good news, but if this person was moribund then probably this is not going to be of great significance. What we also have to be careful of is that just because we see a tube down the wrong way doesn't necessarily mean that the ambulance paramedic put the tube down the wrong way. It is possible after death if the tube is half withdrawn and then somebody thinks, oh, I had better put it back in and they simply push it down not under direct vision and it could slip down the wrong way. All we can say is that at the autopsy it was down the wrong way and that things can happen sometimes between your environment and ours.

BW: Do you expect full compliance with the policy from paramedic staff?

SC: It is not for me to say that, I mean I'm not in a position where I can require that, but a Coroner might have a view. I don't actually have any authority at all in relation to this, but I would think the starting point should be that the devices should be left insitu; that should be the starting point. Then it is a question of what could justify the removal of the device and that would then have to be a justification that the person removing the device would be prepared to account for. It does get very difficult because the need of families, and the desire of families to see the loved one in as normal a state as possible is clearly an important desire and need. On occasions that will conflict with what needs to be done in order for the death to be properly investigated. That's the sort of judgement that professionals need to make, and on occasions they might have to account for that to a coroner. Having said that, I am not aware of any occasion where that has been an issue.

BW: Are you aware of any prehospital cultural issues that may impede conformity with such a policy?

SC: Not really. My experience of hospital and prehospital cultures is that they generally understand their important responsibilities in relation to the death investigation system, the proper processes for doing things, including investigating this. Actually I have a little bit to do with senior people in the ambulance service, they're on one or two of our committees, and they are clearly very professional people committed to trying to make all aspects of the system work as well as possible.

BW: Anecdotally paramedics I have spoken with feel they may be implicated by coronial findings if an ETT was incorrectly placed after resuscitation attempts were ceased and thus often remove items such as ETT's at the scene. Could you please comment on this matter further?

SC: I don't think that is a justification for removing an invasive device such as an ETT or IV if that was their reason for removing it. I personally think that would be unprofessional. Professional people are supposed to have broad shoulders capable of bearing significant responsibility, and part of that responsibility is to be accountable for what they do. Broadly speaking, pathology itself will rarely be able to say that a particular misplaced tube was the cause of death, rather it will be a clinical evaluation based on the clinical material available. I think the justification you mentioned could not be defended in public as a proper justification for doing it. Any justification for removing the device has to be a justification that can be defended openly and publicly.

BW: Paramedics I have spoken with feel that, despite the fact there are policies that state that we should keep all invasive devices insitu for the reasons outlined in the above question, they feel that if the patient is moved and the tube moves into the oesophagus retrospectively that they may be implicated by it.

SC: As I mentioned before, that can happen. But emergency personnel undertake very serious responsibilities in relation to patient management. Just like any doctor, it would be wrong of any doctor to alter records in a way that confuses what procedures were undertaken. Part of the documentation should include where the devices are situated. By removing the devices they are removing any possibility of working out where the device was. We all know that medicine generally and emergency medicine particularly, is not a perfect science and that health care is often performed under trying circumstances where it simply cannot be practised perfectly and that it's understandable that some ETT's can sometimes be placed in the wrong site. I can understand people being nervous, but this is the field you're working in and these are the sort of responsibilities you bear.

BW: Based on your experience, how many ETT placements are incorrectly placed? How many of these are attributed to wrongful placement or by post-mortem movement of the body?

SC: Oesophageal intubation at autopsy is uncommon. I don't think we would know whether in any particular case post mortem movement of the tube has occurred. Clearly, when the tubes are taped in place, post mortem movement is highly unlikely, if not impossible.

BW: Are there any instances where this policy could be adapted to specific cases? For example, for grieving relatives requesting items to be removed.

SC: *I have thought about this quite a bit since we first spoke. Having had time to reflect on this I am not quite as liberal as I might have first appeared. For example, an 8 year old in the emergency department has an asthma attack, has full resuscitation and subsequently dies. She probably should have all invasive devices left intact regardless of whatever requests the family have, because the child was alive and then has had the full treatment regime, and really there may be important aspects of that emergency management. This would be important for clinical review, and not only in a coronial context, but also for hospital and emergency personnel to know whether any aspects of their judgements or actions may have contributed to the death. So in that sort of circumstance I would think there would be little or no justification for removing the invasive devices. If there are circumstances where it seems as though it's unlikely that the emergency management is not any issue in the total picture of that death, then it might be justifiable. In other words, the person doing it maybe have to justify it. I'm giving that as my own personal view, I am not the person who can determine whether or not it is justifiable in any particular case.*

BW: **How should paramedics address their documentation on patient care records in relation to invasive devices when resuscitation attempts have been terminated?**

SC: *Well, they certainly should record what they did and why in relation to any invasive device.*

BW: **Are you aware of other States or Territories having similar policies?**

SC: *No, I am not aware of the issues or the policies relating to this in other States.*

BW: Professor thanks for your time today I appreciate your insight. I am hopeful that today's discussion will be able assist in shedding some light on the potential forensic implications for paramedics in Victoria may face.

Bibliography:

Walker, T. 2001 Removal of invasive devices from deceased persons (CLI2001/03) Rural Ambulance Victoria.

Cooper, G. 2001 Removal of invasive devices from deceased persons (2001/014) Metropolitan Ambulance Service.

[Dr. Hugh Grantham](#) - Medical Director, South Australia Ambulance Service

Whether an endotracheal tube has been placed in the trachea or oesophagus is only marginally more important to the patient than the intubator. Historically the finding of an oesophageal tube at post mortem has been a momentous occasion and the cause of much self doubt and anxiety. Given that the tube has been found in the wrong hole at post mortem the two possible alternative explanations are that it was initially placed there or has moved. Without objective evidence of the original placement; a tube that has been moved after resuscitation has ceased can still cause justified anxiety. For this reason the debate as to whether to remove tubes and thus remove the anxiety or leave tubes in situ risking false position reporting was a historical cultural debate involving paramedics, pathologists and anaesthetists alike.

Today the situation has changed dramatically with objective evidence of tube placement so that the debate can now be confined to history. CO₂ detection using capnography and simple CO₂ detection via colour change in filter paper is now readily available and when coupled with oesophageal detection devices allows tube confirmation at the time of intubation. Furthermore the confirmation can be observed by a witness to the procedure.

False results from both CO₂ detection and oesophageal detection devices can be achieved but are probably not a significant concern.

In the unlikely event that CO₂ is not detected because of an absence of CO₂ production in the dead patient the result will not confirm tube placement, causing the intubator to either replace the tube or confirm placement by other means. In any event a patient not producing CO₂ is dead and the resuscitation attempt is academic. False positives with the oesophageal detector device have been achieved by inflating the oesophagus comprehensively prior to testing but these cases would not be expected to produce CO₂.

With a properly applied and witnessed procedure involving use of the oesophageal detector device before inflation and the continued production of CO₂ (just in case anyone believes in gastric CO₂ from a carbonated drink being a problem) the tube placement can and should be confirmed at the time.

Given that the correct placement of the tube is confirmed and witnessed, subsequent interest in it at post mortem diminishes in importance to a historical note. The impact of the tube upon relatives of the deceased, however does not change and probably becomes the dominant factor in whether to remove the tube or not.

In the current climate with the current technology, assuming it is appropriately applied the answer as to whether or not to remove the tube should probably be who cares? And the answer to this second question should probably be the relatives of the deceased.

Hugh Grantham

Dr. Garry Wilkes – Medical Director, St. John Ambulance, WA.

As I read Professor Cordner's interview, another autopsy report finds its way in to an eclectic pile of information labeled "In Tray". There it sits amongst the research and journal articles, glossy brochures designed to sell new toys, minutes of meetings and the rest of the information that must be sifted through for us to adequately analyze, change and fine tune our practice. Somewhere in there is that elusive "evidence" for the much revered 'evidence based practice'. In my other job as medical director in a busy emergency department, is a very similar pile. Different meetings, different glossy brochures, same unsorted pile of potential 'evidence'.

The report was requested because the paramedic wanted some answers. What were the injuries? Could she or the ED staff have done better? And then the anxiety inducing questions - did she miss something, did she do something wrong? We are grateful to be provided these reports. How else can we truly answer those questions?

As I read, the familiar phrase appears: "There is evidence of medical intervention" followed by brief notation of the ETT, ICCs, successful and unsuccessful vascular access and else that typically accompanies the final moments of life in the ED trauma resus bay.

Normally, I just glance over those comments. After all, it's standard ED practice to leave all the plastic where we put it. Why? Because we know it's invaluable to the pathologist who requests we do so. It is then much easier to determine what is from the primary insult and what is due to our intervention. Which incisions were from medical knives? Which were fatal?

Does leaving devices in situ cause anxiety for ED staff? Yes. Are we concerned they may be in the wrong place? Absolutely! So why do we leave behind such evidence? How do we manage knowing that a device may be subsequently shown to be in the wrong place? The answer is integral to professional practice. Ensure maintenance of skills, adhere to indications, observe contraindications, utilize available confirmatory tests. This may include such things as visual confirmation of ETT placement when it comes time to 'call' the code.

Both pathologist and clinician alike are aware invasive devices can and do move. 'C spine precautions' are not observed en route to the morgue and the tip of an ETT secured at the mouth can move 5cm or more with neck movement – more than enough to ensure it becomes oesophageal. Whether this occurred during or after resuscitation is an important question for this patient and future ones. Clear confirmation of correct placement helps greatly. Document the details. The pathologist reads the resuscitation records and incorporates this knowledge in to the final evaluation.

With time I have become less concerned about relatives witnessing procedures during resuscitation. I now routinely send someone to the relative's room (a luxury prehospital providers don't get!) to ask if they want to be present. To date, not one has said no. None have ever noticed the failed intubation attempts or the dropped equipment. All they see is professionals trying to help their beloved. Most don't even notice tubes in place. Those who do regard this as evidence of those professionals at work. They've seen it on countless TV shows. The majority thank us despite the outcome.

When I ring the paramedic she'll learn the answers to her questions. Almost all the time the answers are reassuring. No, nothing more could be done. If, however, that were not the case, we should not be afraid of the truth. Analyzing errors (which we all make, no matter how senior) is not a blame and shame process. The intention is to work out how the error occurred, how to prevent repeating them and sharing that knowledge. That's what makes it a profession, not just a trade.

Garry Wilkes

Prof. Cordner's summary view

The above commentaries are interesting in that one regards the issue as a historical relic because the intubator in all circumstances can objectively verify the correct placement of the tube. On this basis, any subsequent detection of the tube in the oesophagus will be trumped by records of the objective verification. Likewise, this will also act as a "defence", if ever one was needed, to removing the tubes.

The second commentator considers the issue in the context of all devices being left in situ. The assistance afforded the pathologist in distinguishing medical intervention from other "insults" can be considerable. In my experience, this is absolutely a true statement.

My summary view is that removing the tube could appear to be self serving. A useful starting point when considering the removal of the tube after death has been diagnosed might be: "What is my justification for doing this?" If you feel the justification outweighs a possible

later claim (highly unlikely in my experience, but possible nonetheless) that it was a self serving act, then you may have a basis for removing the tube. You will not be helping the pathologist in removing the tube!

Acknowledgement and Disclaimer:

The Editor would like to thank each contributor for participating in this discussion. Readers should refer to the standard operating procedures and/or clinical practice guidelines/protocols for accepted clinical practice within their agency in relation to the removal of invasive devices from deceased persons.