

A TALE OF TWO TODDLERS

How the absence of post guideline implementation surveillance can lead to adverse outcomes.

Institution: Australian Resuscitation Advisory Network

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This paper will review the circumstances of the untimely and tragic deaths of two Australian toddlers on two separate occasions. These deaths occurred despite full compliance with the recommendations of the Australian and New Zealand Consensus on Resuscitation (ANZCOR) treatment guidelines. The circumstances of these deaths and the failure of current local guidelines have never been reviewed by ANZCOR. This raises significant ethical and scientific methodology issues in that there is no surveillance conducted by ANZCOR of the efficacy of the real-world application using their treatment recommendations nor any consideration or responsibility taken for failure in the formulation and review of these recommendations. All recommendations are made in isolation from actual experience and based on small low-quality studies and individual opinion.

Case 1 – Albie Fox Davis

In March 2018, 3-year-old Albie Fox Davis died whilst waiting for Ambulance care, in his mother’s arms at their home in Wynyard Tasmania. Albie, who was soon to turn 4 was playing with the bouncy ball only a few feet from his mother. The ball was larger than a 50-cent piece and was recommended for his age group as a toy, but became lodged in his throat.



His mother (who had regularly and recently) been trained in first aid (based on ANZCOR recommendations), frantically tried to relieve the obstruction. All these attempts failed until she was forced to attempt 16 minutes of unsuccessful CPR on her own child, which also failed to relieve the obstruction.

Case 2 – Essa Rahman

In 2016, a two-year-old boy, Essa Rahman, died after choking on bubble-gum at a shopping centre in Joondalup (Perth, WA). The boy was at Kmart with his mother on Monday afternoon when he started to choke. The toddler who choked to death on a piece of bubble-gum was in front of horrified shoppers at a Perth Kmart. A stunned crowd watched on helplessly as bystanders attempted to rescue the child. The little boy turned blue in the face as the screaming mother ran into a chemist next door and pleaded for help, witnesses said. He was reportedly unconscious when paramedics arrived and could not be resuscitated.

In this second case, and just like the first, everyone did what they had been trained to do, they sought help quickly, they implemented first aid measures and it all was to no avail.

Questions

This raises several questions, including:

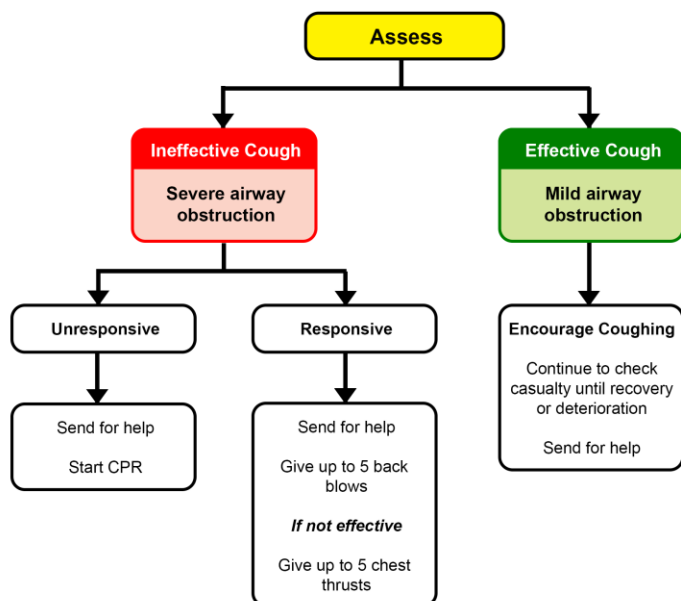
1. *What went wrong and why didn't the emergency go to script?*
2. *Are there any other measures that could have saved these two cases?*
3. *Did any risk associated with other measures outweigh the eventual outcome?*
4. *What lessons are there and will they be learned?*

A Coroner's investigation has commenced into the death of Albie Davis, however so far in the media, the responsibility has only been levelled at (incorrectly) Albie's mother for a lack of supervision and care in giving the child a potential choking hazard and the supplier and manufacturer of the bouncy ball. What has not been questioned or examined is the failure of local choking protocols (that are divergent from every other country in the world) to relieve an obstruction in time to save Albie's life. It is hoped that the Tasmanian Coroner will address this question, even if ANZCOR does not.

1. *What went wrong and why didn't the emergency go to script?*

Regardless of the measures employed in an attempt to relieve a complete upper airway obstruction, the success rate is generally accepted to be less than 70%. This figure assumes that all ILCOR measures are employed, which include Back Blows, Abdominal or ILCOR Chest Thrusts (depending on age and patient size) and lastly CPR if all else fails.

The Australian Resuscitation Council (a non-government, voluntary, private entity), decided in the early 2000s to diverge from the International Consensus recommendation from ILCOR and drop Abdominal Thrusts all together from their local treatment guidelines. The rationale for this was based on a flawed response to a risk assessment of choking measures. Whilst ILCOR properly modified their recommendations to tighten the use of the method and improve safety by restricting it to victims over 1 year of age and raising the importance of proper training; Australia decided to reject the method all together rather than changing training to incorporate the method. One must remember that there is a vested interest by member organisations of the ARC to keep guidelines unchanged due to the significant costs involved in widespread change.



ANZCOR Choking Flowchart

In its place the ARC invented their own bespoke technique, they called “Chest Thrusts” which they claimed was as good or if not better than Abdominal Thrusts while being much safer. The method (as still taught by its member organisation) involves a one-handed chest compression technique. However, unlike other methods such as Back Blows, ILCOR Chest Thrusts, Abdominal Thrusts, and CPR; this new method had no clinical trials, had no relevant supporting evidence, no respiratory studies to determine airway pressure change (or prevalence of injury) and no surveillance of its efficacy in the field or trials. Instead, the ARC decided to use two pieces of “evidence” to justify their divergent recommendations. These two turned out to be firstly a deliberate misinterpretation of data and in the second case the fraudulent use of another method’s data (ILCOR Chest Thrusts, a significantly different technique using two hands around the patient i.e. a modified Abdominal Thrust) to present a picture that this recommendation was valid and robust and based on an appropriate level of evidence.

The first and only study quoted in support of their bespoke method was a single observational study conducted on cadavers who had died as a result of choking and where abdominal thrust had failed. Of the small group of post-mortem subjects, some obstructions were successfully removed with CPR compression i.e. patient supine with two hands and the rescuers mass and strength over the patient. The erroneous conclusion made by the ARC was that this was definitive evidence that any chest pressure is better than Abdominal Thrusts; however, the actual observation proves little more than that choking obstructions may be much easier to remove from victims who are already deceased. This would be little comfort to either parent in these two cases.

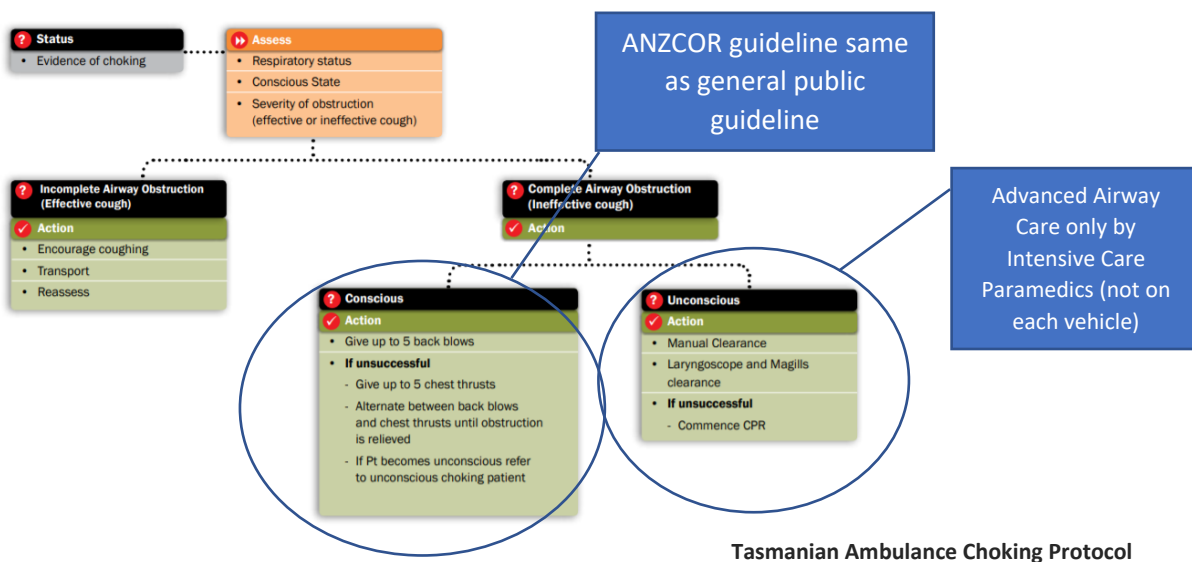
In both these cases, and based on erroneous assumptions and bad science, the rescuers did everything they thought they were allowed to do i.e. trained to do (bearing in mind that most people are under the impression that the ARC/ANZCOR is a Government body that set the

legislation around treatment methods); but in both cases, regardless of the level of training, they all failed these two victims.

2. Are there any other measures that could have saved these two cases?

It is hoped that the Tasmanian Coroner will determine the answer to this question in the case of Albie, provided he or she is willing to examine the methods and recommendations used and with the availability of the autopsy results, however, no inquest was initiated in WA after the death of Essa and therefore these questions have no chance of being asked. While we cannot definitively (at this time) determine if the objects in these case were ever “removable” in the pre-hospital period, we do know that other measures are used and have proven to be more effective than the ANZCOR recommendations.

Firstly, it is important to address one assumption that is often made in these cases, and that is that all Ambulance personnel are equipped with anything more than the ANZCOR first aid measures i.e. carry the equipment and skills to remove an object using Laryngoscope and McGill forceps or create an emergency surgical airway. This is simply not true as these skills and equipment is not universally available to Ambulance personnel (unlike New Zealand where all Ambulance carrying advanced airway equipment and are trained in their use). In Tasmania and in the case of Albie this equipment and training are not routinely available and his situation is likely to be similar in WA.



This assumption made by both the general public and the ARC means that the current ANZCOR guideline recommends (in the case of a severe airway obstruction), that a rescuer stop, call an Ambulance first i.e. before any treatment in an attempt to remove the obstruction. In practice, there would not be a parent or carer (or anyone facing a victim in distress from a severe choking incident), who will stop, delay (withhold) any care until they have called 000 and have been through the Ambulance question set. It turns out that even if the Ambulance is “on the way” and assuming the delay to first aid has made no difference to

the outcome (a position that is contrary to the evidence see <https://doi.org/10.1016/j.ajem.2017.04.016>), when Ambulance personnel do arrive they can often do no more than what has already been attempted (see picture above).

Other measures that may have saved the victims in these two cases were firstly the use of Abdominal Thrusts and/or the ILCOR (evidenced-based) Chest Thrusts and additionally the use of vacuum anti-choking device e.g. LifeVac. Interestingly, all measures have a greater level of evidence and/or a greater success rate in relieving upper airway obstructions than the bespoke ANZCOR method touted as an effective measure that is superior to other measures. While it is hard to definitively claim that these other measures (resisted in Australia), would have made a significant difference in these two toddlers' death, however, the evidence clearly indicates that these other measures are superior in a number of circumstances than the ANZCOR measures.

3. Did any risk associated with other measures outweigh the eventual outcome?

The most significant flaw in the Australian resistance to other methods for the relief of airway obstruction is a failure to appropriately and responsibly determine the relative risks associated with each measure. All choking management methods carry risk, CPR carries risks, however in a situation where options are limited i.e. the rapidly deteriorating patient after the failure of basic ANZCOR measures; the alternative to any risk present in any other measure is not significant when compared to the death or serious brain injury (which cannot be prevented for example in severe choking as a result of average Ambulance response times in most states and territories in Australia and particularly in metropolitan areas).

Obviously, the parents involved in trying to save their own children in these two cases would have (without hesitation) happily accept any risk associated with alternative methods, given the circumstances and the eventual outcome. Tragically, due to a combination of incompetence and recalcitrance, that decision (that should be the parents' prerogative) was denied to the parents in these two cases by the "restriction", (without authority) of what is taught and "recognised" in Australia.

Likewise, and as previously mentioned, the implication that parents are "doing the wrong thing" by not calling an Ambulance (even if alone) prior to attempting to remove a severe obstruction is not just unrealistic but extremely heartless, especially considering the state of Ambulance resourcing, response times and limited advanced training.

5. *What lessons are there and will they be learned?*

There are many obvious and fundamental lessons that could be learned from these two tragic (and probably unnecessary) toddler deaths. The second half of the question is more in doubt.

While there is no post-implementation surveillance of treatment recommendations and guidelines in Australia and a reluctance for improvement or objective scrutiny of failures and weaknesses, deaths such as these will continue to happen and the failure of choking measures blamed on the rescuer or other factors. It is unfortunate that particularly in Australia, any questions raised about the efficacy and scientific rigour in relation to guidelines and treatment recommendations is met with an almost zealot-like defence of the ARC (ANZCOR), without any willingness for deeper investigation or concern.

There are several lessons from these tragic events, although these will be cold comfort to the families that have lost their children at the start of their lives:

- Experimental methods, just like developing technologies need to not only have evidence but proof of efficacy in the real world.
- Failure and adverse events involving poorly developed or largely experimental recommendation (in fact any recommendations or guidelines) need to be openly and honestly reviewed, just as they would be in any other health system.
- There is a need for accountability for organisational, system and guidelines failures. This cannot happen under a non-government, voluntary and private structure. The integrity of such an organisation cannot be questioned and is not, even when there is a clear need for answers. In the two cases quoted in this paper, no one would hold the parents accountable for effectively or ineffectively doing what they were told to do, however, some liability must rest with the body formulating and effectively “prescribing” the methods and training if they fail to deliver the expected outcome and/or have flawed evidence and do not have appropriate review.
- Alternative methods and emerging technologies (although seemingly encouraged by the ARC in its objectives) are actively (overtly and covertly) resisted in Australia with a fervour that is contradictory to any stated intention to improve patient outcomes or save lives and merely stifles improvement. Nor can science be dictated as to how and when it is applied by one group, without this accountability. This is largely how we have arrived at this point, with no answers to fundamental unasked questions around two tragic deaths.
- Ambulance services in Australia (as is the case in NZ) must equip and train all staff in advanced airway care for the removal of an airway obstruction, otherwise calling an Ambulance is merely a routine rather than a resolution.
- The rescuer is sold short by the assumption that in all circumstances they lack the intelligence and reasoning to weigh the risks vs. the benefits of utilising other methods and technologies, particularly in the case of choking. There is a certain arrogance in this assumption that permeates ANZCOR guidelines and denies the individual faced with a life and death situation a range of options that may just save the life of a loved one.

If in fact the ANZCOR recommendations (which do not always reflect the international consensus) are in some way superior to other recommendations by way of a more rigorous consideration of the science, a greater insight into the practical application of recommendations in the field and a tougher and exhaustive experimental development methodology, we would be able to measure the quantum and quality of the outcomes and compare these with other treatment regimens and practices, and should see measurable superiority. However, unless externally dictated, this will never happen and we will continue to overlook an important and fundamental weakness and contributor to untimely deaths such as these.

Conclusion

It is easy to skip over the full range of contributing factors that led to these two tragic deaths. While we applaud the desperate efforts of the parents and bystanders in these cases, we cannot overlook that a guideline failed in both these cases. We cannot judge the actions of those who tried to help but we can and should question the reason they felt constrained not to do more and the robustness, efficacy, and utility of the guidelines they were instructed to follow. In any other robust health system, these questions would be part of the process of improvement following any adverse event, especially a death.

There are some fundamental and entrenched problems with first aid guideline formation, review, and accountability in Australia that have not been addressed or questioned, even in when the result is an unexpected death in two innocent toddlers.