

Critical Care and Resuscitation: we hit the ground running

Management of the critically ill patient requires resuscitation as well as treatment of the underlying disease. The Intensivist commonly resuscitates the patient first (to keep the patient alive) before undertaking measures to diagnose and manage the underlying condition.

However, resuscitation by itself is unlikely to cure the patient, just as treatment of the underlying disease in the absence of effective resuscitation is unlikely to achieve a successful outcome. Knaus encapsulated this concept by stating that "The best a good ICU care can accomplish is to reverse acute physiological abnormalities and buy time. If during this time, therapy works or the body mounts its own attack, the patient will live. If not, then all ICU care can achieve is delay".¹

The journal *Critical Care and Resuscitation* has been launched to attract the interest of the Critical Care medical community and to focus on relevant aspects of both resuscitation and the underlying disease in promoting research on the critically ill. It will be published as a quarterly.

We have no shortage of enthusiastic authors, acknowledging that while the amount of writings will be a measure of the vitality and activity of the discipline, quality will be paramount as it will be an indication of our intellectual state.²

We wish to thank two individuals who have helped us during our early stages. They are Dr. John Roberts (Chief Editor: *Anaesthesia and Intensive Care*) and Dr. Jeanette Thirlwell Jones (Executive Editor: *Anaesthesia and Intensive Care*), both of whom have introduced us to the numerous benefits (and pitfalls) of medical publishing, and both of whom have generously wished us all success in our new venture.

Dr. L. I. G. Worthley
Chief Editor,
Critical Care and Resuscitation

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Learning to live with meta-analysis

Evidence based medicine has been a necessary historical development as accountability becomes a significant driver in healthcare. A major tool of evidence based medicine is the meta-analysis, in which all the valid data from studies are pooled to provide ostensibly more valid results than in individual studies. Studies that are poor scientifically will not enhance the validity of the pooled data. Both the search criteria and acceptance criteria require rigorous definition in order to reduce selection bias. In this regard meta-analyses are particularly difficult to analyse. To thoroughly review one would require not only reviewing the papers included but also looking at those excluded. There also seems to be a bias amongst physicians in accepting the results of meta-analyses depending upon whether these results agree or disagree with the physician's preconceived ideas. Those who disagree will usually cite the study of Leloir *et al*, which showed that subsequent large randomised trials invalidated 20% of meta-analyses addressing the same question.¹ Three recent meta-analyses relevant to Intensive Care illustrate the dilemma the clinician faces.

A meta-analysis of selective decontamination released on the UK Cochrane Foundation Web Site found that selective decontamination reduced the incidence of nosocomial pneumonia (a finding duplicated by three other meta-analyses) but in contrast to the other three meta-analyses found improved survival.² I cannot find an Australian ICU where selective decontamination has been introduced as a result of this study.

A meta-analysis of H₂ antagonists versus sulcralfate in the prophylaxis of stress ulceration and incidence of ventilator acquired pneumonia found clearly in favour of sulcralfate.³ This led to a change of practice in our unit after detailed discussion. A subsequent large study by the Canadian Critical Care Clinical Trials Group found the reverse.⁴ We have changed again.

The meta-analysis of albumin versus all comers in the critically ill⁵ has attracted an unprecedented correspondence, almost all of which condemned the study.⁶ The problems associated with this study have been dealt with in detail. Neither the groups studied nor the controls were in any way homogeneous. The studies were small and the endpoint of mortality was the endpoint of the meta-analysis as opposed to the endpoints of many of the studies. This meta-analysis was greeted with joy by the protagonists of crystalloids (which were not used in many of the studies) and vehement denouncement by the colloid protagonists,

reawakening an ancient war that most of us tired of in the seventies. Correspondence from some of my North American colleagues suggests that it has immediately been seized upon by HMO managers to outlaw albumin solutions. Interestingly the study has also produced a response from the Australian Health Department. The reasons for this are likely to be financial (e.g. the Government spends a large amount on buying albumin solutions from the Commonwealth Serum Laboratories), as no other meta-analyses relating to health outcomes appear to have produced a similar response.

Good and useful meta-analyses seem to be those that address focused questions in homogeneous groups, just as the large-scale studies of cardiological interventions benefit from easily defined homogeneous groups with a single system problem. Intensive care patients are sadly a very heterogeneous group, making studies very difficult. In relation to the colloid-crystalloid story, I find it very difficult to believe that the type of fluid used in resuscitation, if given in appropriate amounts, could have any impact on outcome.⁷

It is essential that we treat meta-analyses with healthy scepticism. It would seem appropriate that publishers consider the publication of meta-analyses along with the comments of experts, for the rebuttals never seem to attract the attention of either the media or those who may see cost cutting opportunities in their publication.

Australian intensivists have lived through many swings and fads. Steroids are good, steroids are bad, steroids are indicated in selected patients. It may be that the phrase "indicated in selected patients" is the key to the future and a greater effort to identify the individuals in whom a treatment makes a difference will be the focus of the future.

Professor M. McD. Fisher
Intensive Therapy Unit,
Royal North Shore Hospital,
NEW SOUTH WALES 2036

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Standards for resuscitation – Can we avoid the “Inertia of tradition”?

Tradition has much to recommend it. However in some areas of medicine tradition appears to possess a degree of inertia which is less than ideal.

Recently the International Liaison Committee on Resuscitation (ILCOR) produced consensus guidelines on Basic Life Support (BLS) and Advanced Life Support (ALS). ILCOR was formed in 1992, as an informal gathering of representatives from a number of different resuscitation councils from around the world. These included the American Heart Association (AHA), the European Resuscitation Council (ERC), the Heart and Stroke Foundation of Canada (HSFC), the Resuscitation Council of South Africa (RCSA), the Council of Latin America for Resuscitation (CLAR), the recently formed New Zealand Resuscitation Council and the Australian Resuscitation Council (ARC). ILCOR was formed in an attempt to get international agreement for guidelines for resuscitation. Initial impressions were that this would seem to be a major advance and a chance for international agreement to be reached.

The ILCOR advisory statements were published in 1997.¹ These included statements on a number of issues including single rescuer cardiopulmonary resuscitation, early defibrillation, paediatric resuscitation, special resuscitation situations, asthma, a universal advance life support algorithm and others.

The statement on early defibrillation in particular provides an interesting insight into the development within a specific area of resuscitation. Twenty years ago, defibrillators were carried on ambulances by only the most advanced crews, typically paramedics. In hospitals, among non-doctors, only specially trained registered nurses, usually with an advanced certificate, were allowed to defibrillate. The skill of defibrillation was viewed as a complex component of advanced life

support. This meant that defibrillation was often delayed. In the pre-hospital setting this was because the first responding ambulance had to wait for the paramedic back up: in the hospital, the ward nursing staff had to wait for the cardiac arrest team to arrive. As time passed, it became clear that early defibrillation was by far and away the most effective measure in treating sudden cardiac arrest. For a successful outcome, time was of the essence.

Although this has been apparent since the early 1980s, it has taken many years for the skill of defibrillation to be demystified. The advent of reliable semi-automatic defibrillators has significantly assisted this. While it is now widely accepted that all emergency ambulances should have a defibrillator, and even the most basically trained volunteers can be taught to use these effectively, the situation in hospitals has been much slower to progress. Some nurses are still not 'allowed' to defibrillate. The reasons for this are unclear, but they don't appear related to scientific data. Perhaps this is an example of the "Inertia of tradition".

The ILCOR advisory statement "strongly encourages the development of early defibrillation programmes for non-physician in-hospital responders." The statement also acknowledges that defibrillation is being carried out by non-medical members of the community. Qantas has lead the way with flight attendants trained to defibrillate, and around the world police, life-guards and workplace first-aiders, among others, have all been trained to perform this skill.

What is interesting is that the 'Inertia of tradition' is evident even in this otherwise excellent ILCOR statement. Clearly defibrillation has moved from ALS into the BLS field with its widespread use by non-medical people. Despite this, the statement was released by the *Advanced* Life Support Working Group of ILCOR, suggesting perhaps that even ILCOR has some difficulty accepting this change.

Another similar issue, while seemingly insignificant, has the potential to prove divisive at a time when consensus had appeared possible. In Australia the ILCOR advisory statements have been reviewed by the ARC, which has subsequently released modified policy statements as a result of this review. Despite the fact that the chairman of ARC has been a member of ILCOR, this process has not been as straightforward as initially hoped. This is exemplified by the ILCOR advisory statement on BLS,² and the most recently released ARC policy statement on expired air resuscitation.³

A major issue of contention within this policy statement has been the question of the number of initial breaths that should be given to an unresponsive and apnoeic patient when first found. While this may seem a relatively trivial point, it has resulted in much

discussion at a number of ARC meetings as well as the need for an extraordinary meeting specifically to discuss the issue. The ILCOR statement on BLS² states "If the victim is not breathing.....give 2 effective rescue breaths, each of which makes the chest rise and fall.....make up to 5 attempts in all to achieve 2 effective breaths."

After much argument, ARC felt unable to comply with the ILCOR statement. Accordingly the latest ARC policy reads "Give 5 initial breaths in 10 seconds....". ARC has effectively not changed despite the release of the ILCOR statement.³ Is this the inertia of tradition?

At the same time St John Ambulance Australia, which is the major teacher of BLS in Australia has released their new manual recommending 2 initial breaths in accordance with the ILCOR statements. One clear difference, from the defibrillation situation, is that there are not data to support either two or five breaths. People involved in cardiac resuscitation claim that minimal initial breaths are needed as the key is to get blood circulating and to get to early defibrillation. Those involved in water sport resuscitation believe that the near drowning victim needs the five breaths, as hypoxia is the major problem. In both cases, given the lack of data, it seems possible that the arguments had a significant element of 'what we've always done' or the 'Inertia of tradition'.

While this confusion between 2 and 5 breaths may seem inconsequential, there is now a situation where the lay public first-aider and hospital staff alike will be taught either what ARC or ILCOR recommends. There has been a failure to reach consensus with differing practices taught around the country for possibly years to come. This will lead to confusion, which could have been avoided, an effect that seems unlikely to help the already well documented deterioration in BLS skills that occurs in many practitioners over time.

While the need for evidence based medicine is clear; in areas where evidence is not available, and perhaps not likely to become available, the best option is less clear. When the evidence is there – we need to be able to accept it, and be willing to admit that our previous practices, while deemed appropriate at the time, were not optimal. We must change what we do to match the current best data, rather than stick to our preconceived ideas. When the evidence is not there, perhaps consensus, if achievable, is the next best option. These issues are not confined to resuscitation; the 'Inertia of tradition' can be the antithesis of good medical practice in general.

Dr. W. Griggs
Department of Trauma,
Royal Adelaide Hospital,
SOUTH AUSTRALIA 5000

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Issues of withdrawal of therapy and brain death in paediatric intensive care

Decisions involving withdrawal of therapy are based on likelihood of recovery and quality of life issues. It is clearly wrong to initiate or continue support when there is no chance of benefit, although at times, continued support is appropriate to allow time for organ donation, and can be justified to allow relatives time for a grieving process.

Issues for withdrawal of therapy in the paediatric age group are different to those for adult patients. These differences relate to the importance of parental advocacy, the unique emotion surrounding a child's death, childhood disease processes and problems in brain death determination. The decision to withdraw therapy is most appropriately taken by physicians and parents.

But the burden and emotion of the decision-making process dictates that it be shared with other intensive care staff, relatives, clergy and social workers. Guidelines for withdrawal of therapy include decisions being reached by a consensus between parents and attending physicians, scrupulous observation of informed consent, and observation of legal requirements. By far the majority of decisions are made in this way. When there is conflict, decision-making can involve other medical staff not directly concerned with the patient's management, and, rarely, legal intervention. The over-riding principle must be that the decision is made in the best interests of the child.

In the paediatric age group, death is most commonly due to congenital lesions under 1 month of age, sudden infant death syndrome under 12 months of age, and trauma over 12 months of age. While causes of death

are clearly different, there are three distinct circumstances when withdrawal of support can be difficult: acute events, chronic illness and brain death. Each scenario has its own unique dilemma for the decision-making process.

Hopelessness of outcome can be associated with an acute event such as vegetative recovery from near drowning. In such cases, there are difficulties for parents in making appropriate decisions because of the emotion of the sudden catastrophic event, and the presence of an unfamiliar environment with feelings of helplessness. This is often complicated by emotions of guilt and blame among parents and other relatives. The result can lead to inappropriate parental thought processes that are difficult to overcome and may impede appropriate decision-making processes. Importantly, the result may lead to conflict either between the parents or between the parents and the care-givers.

Withdrawal of therapy is difficult in the presence of inappropriate denial and unresolved grieving and it is important to ensure that parents stay focussed on important issues. In this situation, it may help to involve respected family members and other more familiar physicians and clergy.

When hopelessness results from chronic, progressive and debilitating disease processes such as cerebral palsy or muscular dystrophy, then decisions that appear to be medically appropriate may be at odds with parental wishes. Withdrawal can be difficult because the parents are often sole care-givers, and their lives are devoted to the daily care of their loved ones who may be unable to interact with their environment in any meaningful way. It is often very difficult for intensive care staff to intervene in this type of relationship. In the end, the parents are the advocates for the child, and their wishes need to be respected.

The determination of brain death in children has implications that are different for adults.¹ Isoelectric EEG's have been described in neonatal patients in the presence of partially preserved clinical brain function. Also, brain death can occur in children without marked increase in intracranial pressure, so it is possible to have some degree of cerebral blood flow and yet fulfil the criteria of brain death and have electrocerebral silence. However, the pattern of blood flow is highly abnormal, and there is no uptake of contrast in the cerebral cortex. In addition, recovery of some brain function has been demonstrated after prolonged periods of unresponsiveness.

So for determination of brain death, consideration needs to be given to longer observation periods, more frequent use of confirmatory tests, and an emphasis on the history and clinical findings. The American Academy of Pediatrics has set longer observation times and included the requirement for two separate EEG's or

one EEG and a cerebral radionucleotide angiogram. These longer observation times depend on the child's age, namely over 1 year age - 12 hours observation, ages 1 month to 12 months - 24 hours observation, ages 7 days to 2 months age - 48 hours observation, and no recommendation for patients under 7 days age. The Australian and New Zealand Intensive Care Society recommendations only make reference to the under 2 months age group when "determination of brain death may be more difficult and different time periods may be required".²

However, there is no clinical evidence for any differences in observation periods, and a majority of authors apply the same brain death criteria for newborns, infants, children and adults.³ The most important factors when determining brain death are knowing the cause of coma, and being certain of its irreversibility.

The emotion surrounding a child's death is overwhelming for both relatives and intensive care staff. Children die suddenly from catastrophic events that at times seem unfair and unreasonable. For parents, grieving commences before or during the intensive care admission, and intensive care staff are intimately involved in helping relatives through this process. Additional stress occurs because staff are required to change their clinical focus from saving the patient prior to withdrawal, to the more emotional focus of allowing the child to die with dignity. Care givers need to assess their own emotional and intellectual understanding of the decisions before attempting to communicate with parents, and may have to deal with their own feelings of failure. Communication between all staff is important, and emotional support should be provided, with follow-up group discussions a useful forum.

The death of any child is a tragedy. For intensive care staff, understanding that withdrawal of therapy can be appropriate, ensuring that the process has dignity, and that parents need to be helped through the grieving process, are important parts of their professional life.

Dr. N. T. Matthews
Intensive Care Unit,
Women's and Children's Hospital,
SOUTH AUSTRALIA 5006

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The Australasian Academy of Critical Care Medicine

Critical Care Medicine or Intensive Care Medicine in Australasia has a long and proud history. The Faculty of Intensive Care, Australian and New Zealand College of Anaesthetists (ANZCA) and the Australasian College of Physicians have developed training schemes for those who wish to be trained and register as an Intensive Care specialist, and the Australian and New Zealand Intensive Care Society has catered for the industrial needs and promoted the scientific aspirations of the Australasian Critical Care medical community.

In 1983, following an intense five day course at the Royal Adelaide Hospital which included many sessions emulating the exam process for four individuals who were about to sit for the Faculty of Anaesthetists, Royal Australasian College of Surgeons, Intensive Care diploma (now the Faculty of Intensive Care, ANZCA, diploma), the chairman of the Court of Examiners (Professor Don Harrison) encouraged the course organisers to open it up to all Australasian Intensive Care Medicine trainees on an annual basis.

The Australian Short Course on Intensive Care Medicine (ASCICM) began in 1985 and was held at the Royal Adelaide Hospital, Adelaide, South Australia. Initially it was an intensely interactive programme with candidates often completing the week feeling as though they had been on a medical educational 'boot camp'. While many enjoyed this style, many did not, so over the years it changed. The style has become less threatening and its focus is less on the intensive care examination and more on how the Intensivist should think and perform. We have become more interested in clinical competency and less interested in the tricks to gain a diploma. It is not only knowledge that one wishes to convey, the intention is to impart an understanding of critical care disorders, encouraging a healthy scepticism, curiosity, and enthusiasm, for all aspects of Critical Care Medicine.

During this time the course enrolments increased, making the bedside clinical sessions (a characteristic of the course) difficult to arrange. Nonetheless, these sessions remain, as all trainees are fascinated by the ability to see how the 'leading lights' of Australasian Critical Care medicine perform at the bedside.

The interactive sessions that focus on biochemical tests, chest X-rays, ECG's, blood gas forms and CT scans, still require registrants to think on their feet as they interpret the various abnormalities in front of their peers (the questions are modified in accordance with the

stage of their training), although those who are shy are given the option to decline direct questioning.

In 1992 the course changed campuses and now is centred at the Department of Critical Care Medicine, Flinders Medical Centre, Bedford Park, South Australia.

With the many changes, some still desired an exam oriented format. With this in mind, a weekend 'Clinical Refresher Course' (designed to help individuals wishing to sit for the Faculty of Intensive Care Part II examination - with all sessions simulating the exam) was held on August 28th - 30th 1998 at the Royal Brisbane Hospital and Princess Alexandra Hospitals, Queensland, Australia. The course was an overwhelming success and will be held annually.

Over the last four years we have published seven books. The Australian Short Course on Intensive Care Medicine - 1996, 1997, 1998, and 1999 Handbooks, past exam questions from the Faculty of Intensive Care, ANZCA (1996, 1997) and Clinical Examination of the Critically Ill Patient. We are now embarking on our next publishing venture, a journal: *Critical Care and Resuscitation*.

All of this activity has required us to become incorporated, which we have achieved through the formation of the Australasian Academy of Critical Care Medicine: Australasia, because we have had trainees from Australia, New Zealand, Singapore and Hong Kong, and Academy because that's what we are.

The Academy also has a comprehensive web site at, <http://som.flinders.edu.au/FUSA/CriticalCare/AACCMHomePage.html>, which currently highlights the many activities of the Academy and displays the photographs of all previous course registrants. It is hoped that this site will develop to involve interactive elements (e.g. multiple choice questions).

The response to this new venture from the Australasian Critical Care medical fraternity has been overwhelming, although the Academy's journey has only just begun. With so much talent and so many new and eager Intensivists, we look to the future with expectation and excitement.

*The Australasian Academy of
Critical Care Medicine*