

Surviving cardiac arrest

Public-access defibrillators are a solution we should implement more widely

THE LOGIC IS SIMPLE, but the implementation difficult and the costs potentially astronomical. Simple, because the cause is usually ventricular fibrillation (VF), which, if corrected within one minute, leads to survival in well over 90% of patients.¹ Implementation is difficult because of the 10% fall in survival for every minute that passes from onset of VF until a defibrillator can be used.¹ Astronomical cost is anticipated if all people at high risk of VF were to be offered an implantable defibrillator,² or if the conventional ambulance service were geared up to provide a response time of less than five minutes in metropolitan areas.

Novel approaches are required, as the average Australian ambulance response to cardiac arrest is 8–10 minutes even in metropolitan areas, and the survival to discharge for VF is generally less than 10%. A new initiative is presented on *page 305* of the Journal — Smith et al report the experience in Melbourne, where fire fighters have been trained to defibrillate, fire trucks are equipped with defibrillators, and a three-tier response (ambulance, intensive care ambulance, and fire vehicle) is made to 000 calls for suspected cardiac arrest.³ The Victorian Government and the Victorian Department of Health are to be complimented on trying a new approach, as are the emergency service officers who participated. But the results are disappointing, despite overall mean response time of 6.0 minutes and time to defibrillation of 8.8 minutes. Of 2942 events, 1331 patients were in cardiac arrest and considered for resuscitation, but just 155 were in VF. From these, there were 26 known survivors, of whom 10 received initial care from fire fighters and 16 from ambulance paramedics. Of the 10 initially treated by fire fighters, possibly half would not have survived with the later arrival of an ambulance. The low prevalence of VF (12% of all [155 of 1331]; 36% of presumed cardiac arrests [155 of 430]) contrasts with the 100% prevalence at the Melbourne Cricket Ground,⁴ suggesting that there was substantial delay in calling 000.

In the Melbourne experience for three-tier response, costs were not estimated, but must include the wage margin negotiated with fire fighters, the cost of training and equipping vehicles, and any overtime worked. A rough estimate for a possible five lives saved among almost 3000 calls reported by Smith et al is more than \$1 million. The question arises, is there a better way? In the United States, emergency medical services are usually provided by town or city fire departments. However, except in model cities like Seattle, response times are similar to or longer than those in Australia, and survival rates correspondingly bad. In Rochester, Minnesota (home of the Mayo Clinic), defibrillators are carried in police vehicles. As in Melbourne, these vehicles respond to an emergency (911) call and have reduced response time to five minutes, with overall survival

boosted to more than 40%.⁵ This system has been tried in other US cities and rural areas, but without the same commitment or success. Regrettably, in most instances, the overall survival rate remains less than 10%, and could be worse in an environment where security is more intense and access more difficult.

Is there another way to tackle this problem? Clearly, we can identify high-risk individuals and insert a pacemaker/defibrillator (as in US Vice President Dick Cheney), but at high cost, and with benefit to a small fraction^{1,2} of the more than 10 000 people who suffer cardiac arrest outside hospital each year in Australia. Most cardiac arrests are unexpected and occur in people with little or no apparent risk.¹

A different way was first suggested by Frank Pantridge, who initiated the “coronary ambulance” concept. In 1968, he developed a small portable defibrillator, which he suggested be located like a fire extinguisher in buildings and public places.⁶ His idea fell flat, since the device could be used as a weapon, but has regained credibility with development of semi-automatic defibrillators that can only be activated if a person is in VF.⁷ These defibrillators were introduced into all ambulances in New South Wales in 1990, then into the Qantas aircraft fleet in 1991,⁸ then much more widely. The high survival rates for VF at the Melbourne Cricket Ground (71%),⁴ Chicago (O’Hare) Airport (75%)⁹ and Las Vegas casinos (53%)¹⁰ are attributable to very early use by first responders (St John volunteers, airport staff, passers-by, or security officers), who can initiate defibrillation well within the time it takes for conventional emergency services to arrive.

What then is the current status of “public access defibrillation” — the fire extinguisher approach? The program has the blessing of the American Heart Association and the International Liaison Council on Resuscitation, which have been promoting it with increasing enthusiasm since 1990. In Australia, it has been promoted by St John Ambulance (the most experienced voluntary body), the Heart Foundation, and the Australian Resuscitation Council. In the US,⁷ state legislation has been introduced to permit early implementation, and federal legislation has been passed to provide defibrillators for isolated areas, and to require installation of defibrillators for “public access”, with key staff trained, into all major federal buildings and into all passenger aircraft with one or more cabin attendants by mid-2004. In the United Kingdom,¹¹ more than 800 defibrillators have been deployed in public places and another 3000 placements planned — and key staff trained — under a government initiative.

Australia, regrettably, has fallen behind. The NSW Ambulance Service provided key advice in development of the original Laerdal semi-automatic defibrillator, while

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Qantas was the pioneer in the sky and set the benchmark for aircraft and airports in 1991. The National Health and Medical Research Council (NHMRC) has, to date, not seen cardiac arrest as a health priority, despite more than 10 000 lives lost yearly and a potentially high salvage rate. Currently, St John Ambulance Australia has a proposal before the federal government for a program with strong community links and has a belated chance to match or better what is happening in the US, the UK and elsewhere.

The Melbourne experience reported in this issue may be disappointing, but it is an important step by the Victorian government, emergency services and medical personnel, who have already achieved recognition for other initiatives in pre-hospital care. We have new tools and we need to implement them to address the most common cause of sudden unexpected death in our community.

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Drug advertising: truths, half-truths and few statistics

Advertisements should provide better information about efficacy and safety

IN THIS ISSUE OF THE JOURNAL, Loke and colleagues (page 291) present data from an analysis of 174 advertisements for pharmaceuticals appearing in six Australian medical publications.¹ The findings are striking enough to be restated. Fewer than 8% of the advertisements contained quantitative data about the outcomes of therapy, and most of these framed the information in relative rather than absolute terms. Only 28% of the therapeutic claims in the advertisements conveyed clinical outcomes in any specific, substantive and unambiguous way. In the United States, pharmaceutical advertising is subject to the Federal Food, Drug, and Cosmetic Act,² and Loke et al suggest that, in Australia, advertisements for drugs may be less informative than in the US. The pharmaceutical industry has long maintained that drug advertisements are an important vehicle for conveying important information about new drugs to prescribers. Is this how industry believes it should communicate with highly trained healthcare professionals? Should we really be surprised by the results of Loke et al, and, more importantly, should we be concerned?

We know that the pharmaceutical industry spends enormous sums on promoting its products (about twice the amount spent on research and development),³ but most data on the effect of advertising on prescribing are unpublished, and have been gathered by advertising companies. The Association of Medical Publishers (AMP), a US-based organisation whose membership includes the publishers of nearly 200 biomedical journals, boasts "advertising in medical publications alone ... can generate sales for both new and more-established products" [original emphasis].⁴ AMP

reports a number of studies that have shown a significant increase in market share and retail sales as a result of medical journal advertising, which is reported to provide a return on investment (ROI) of about US\$5.00 for every dollar spent, greater than detailing (ROI US\$1.72) and direct-to-consumer advertising (ROI US\$0.19).⁵

Most advertisements are for new and expensive drugs, so increased use due to promotion will contribute to the financial pressures on the Pharmaceutical Benefits Scheme (PBS). Does journal advertising also lead to inappropriate practices? Although there is a substantial body of research on the effects of pharmaceutical industry promotion generally, relatively little involves printed advertisements in medical journals. In a landmark study, Avorn and colleagues studied physicians' beliefs about the efficacy of two classes of drugs (propoxyphene analgesics and central/peripheral vasodilators) that were being heavily promoted as effective, despite evidence that they lacked any efficacy and offered no advantages over existing treatments.⁶ The authors found that, even though doctors reported paying little attention to drug advertisements, most doctors believed that these agents were effective.

Do the results reported by Loke and colleagues have other implications? What is their relevance for the development of government policy? The Australian Competition and Consumer Commission (ACCC) is currently examining an application for reauthorisation of the Code of Conduct of the Australian Pharmaceutical Manufacturers' Association (now Medicines Australia). As part of the examination of the relationships between pharmaceutical industry partici-