The 6th Asia Pacific Military Medicine Conference: Sydney, 1996

Opening Address[[1]](#footnote-1),[[2]](#footnote-2)

Major General D.G. Rossi RAAMC[[3]](#footnote-3)

Introduction

Mr Chairman, distinguished colleagues in the profession of military medicine. It gives me very great pleasure to address you this morning on our main conference theme - medical evacuation. But before starting I would like to acknowledge the presence of the Surgeon General of the US Army, General La Noue, and also that of the USARPAC Surgeon and my co host for this meeting, General Todd. These two gentlemen have been good friends of Australia and the Asia Pacific region for many years. On behalf of all the delegates present I would like to extend to both of you gentlemen, a very warm welcome.

Last year when we started planning this Sixth Asia Pacific Military Medicine Conference I chose the theme of medical evacuation for a number of reasons. Firstly, it is the mainstay of military medicine during operations, and it is critical that we never lose sight of our central reason for being - that is the conservation of manpower during war fighting. The second reason I chose this theme is that many of the countries represented here today have in recent years been involved in coalition warfare or United Nations’ peacekeeping operations and we have much to learn from you about battlefield medicine and evacuation. The final reason I chose this topic was that as we share ideas on how to help each other on the battlefield so will we learn to confront together the challenges and opportunities facing the Asia Pacific region towards the beginning of the third millennium.

This morning I would like to take a quick journey through some past conflicts which have shaped our military medical evacuation systems on the ground at sea and in the air. In doing this I intend to demonstrate that it was the circumstances which existed during those times which shaped our systems and procedures for evacuating the sick and wounded. This approach will lead me, and I trust all of you, into considerations of the likely future of armed conflict. How will we operate on the twenty four hour a day battlefield dominated by the technological, revolution in military affairs? How will we locate our casualties, let alone extract, resuscitate, evacuate and then track them home through a seemingly endless maze of treatment points, reception stations and embarkation areas?

My hope during this exciting week of challenging and stimulating discussion is that we will be able to address these great challenges and seek ways to overcome the difficulties in order to look after our troops and relieve suffering. To that end I would like to reiterate the welcome extended by the Vice Chief of the Defence Force to all of you. I note with much pleasure the wide range of delegates, the record number of attendees and the interest shown in this conference by the breadth of scientific papers being presented in the fields of combat casualty care, battlefield psychiatry, and infectious diseases to name a few.

For the next twenty minutes or so I want to trace the origins and development of the chain of evacuation from the early seventeen hundreds to now. When examining history, the problem is of course that there is too much of it! So, what I intend doing is to examine some of the key players and conflicts which have shaped our medical support concepts and see what influence they had specifically upon level two, or second echelon medical care.

The chain of evacuation

Clearly, from the very earliest stages of human conflict there has always existed some mechanism to evacuate the wounded to clear the battlefield, but it is only relatively recently that specialised units have existed to carry out this task.

In the early seventeen hundreds it should be remembered that the average soldier wounded in battle had little to look forward to and often prayed to be spared the surgeon’s knife. Hospitals were of uniformly poor quality and they had to move far too much, mostly for logistic reasons. Marlborough’s siege train of eighteen heavy guns and twenty siege mortars required three thousand wagons and sixteen thousand horses to move it and it took thirty miles of road. Such an elaborate supply organisation could not possibly bring up the fodder for the forty thousand animals that typically accompanied an army of a hundred thousand men. Such an army spent much of its time just moving to new grazing lands because 40,000 animals went through eight acres a day.

Medical science was somewhat rudimentary and if the casualty survived his very lengthy evacuation he could look forward to copious therapeutic bleeding, explosive purging and in the case of limb wounds, early wide amputation without the benefit of anaesthesia. The scene outside the surgeons tent kept all but the stout hearted away!

The shortage of wagon transport for the sick and wounded had always been a major obstacle to their quick removal to hospital and to their early treatment. The generally accepted method of evacuating sick from the units to the rear was by means of bread wagons which delivered bread daily to the different regiments. This was now to be improved with the establishment of an army wagon train and by contractors supplying wagons to hospitals.

Larrey

In describing the development of organised evacuation I would like to start with Baron Larrey (1766‑1842) who served as a surgeon to the French Army for 25 years on virtually continuous active service! Larrey through his extensive experience of 28 Campaigns is credited with many advances including noting the infectiousness of trachoma and he published the first description of trench foot. More importantly for our purposes today, Larrey made a significant contribution during the campaign of the Rhine in 1792, and I quote from his extremely well written, and authoritative memoirs:

*“I now noted the inconveniences to which we were subjected in moving our ambulances, or military hospitals. The military regulations required that they should always be one league distant from the army. The wounded were left on the field, until after the engagement, and were then collected at a convenient spot, to which the ambulances repaired as speedily as possible; but the number of wagons interposed between them and the army, and many other difficulties so retarded their progress, that they never arrived in less than 24 or 36 hours so that most of the wounded died for want of assistance.”*

This problem suggested to Larrey the idea of constructing an ambulance in such a manner that it might afford a ready conveyance for the wounded during the battle. There were two sorts of vehicles one with four wheels the other with two for transport across rough country. The light carriages were on springs and had windows on each side and a folding door which opened front and rear. Larrey organised these individual vehicles into his famous “flying ambulances” which were based on his observations of the great effect of the flying artillery. These comprised three divisions each of 113 men and 16 carriages. Larrey first applied this new unit at the battle of Mentz in 1793. After victory he was mentioned in despatches by the French General who stated that:

*“Surgeon Major Larrey with his companions of the flying ambulance, whose indefatigable attentions to the wounded have contributed essentially to the cause of humanity, and of their country.”*

Well, so much for Larrey - I commend his memoirs to you for future study.

American Civil War

Next, I would like to travel in time and space forward some 70 years and across the Atlantic to the American Civil War where we will meet another great man who in his short military career initiated three main reforms which remain crucial to us today. Jonathan Letterman in his straightforward yet lucid, “Medical Recollections of the Army of the Potomac”, describes clearly his concerns regarding the misunderstanding of the medical services by the line officers - a situation which is certainly still with us today. From this observation he developed and took three great strides the results of which remain relevant today: firstly, he noted the conflicting priorities for movement on the battlefield and therefore, he placed the ambulances under the control of the medical officers. Secondly, he noted the overall importance of the chain of casualty evacuation rather than the individual medical units and he managed to have this casevac chain placed under medical control. Finally, with the help of McClellan, he was able to strengthen the hands of his commanding general by keeping his army in the most vigorous of health. Here we see the emergence of modern day field preventive medicine. Certainly, the success of the medical plan at the battle of Gettysburg in 1863 was largely due to the initiatives introduced by Letterman. As we can today, he was able to promulgate his principles in general orders but more than us, he was able to commit them to posterity by having his recommendations enacted by Congress in March 1864 as an Act To Establish a Uniform System of Ambulances in the Armies of the United States.

Boer War

The war declared by the Boers on 11 October 1899 gave the British, in Kipling’s famous phrase, ‘no end of a lesson’. The British public expected it over by Christmas. It proved to be the longest (two and three quarter years), the costliest (over 200 million Pounds), the bloodiest (at least 22 0000 British, 25 000 Boer and 12 000 African lives) and the most humiliating war for Britain between 1815 and 1914.

When negotiations finally broke down between the British government and the South African Republic, in October 1899, Australia was still a continent divided into six separate colonies each with its own defence force. All colonies offered troops and the British reluctantly accepted and eventually a number of units consisting of no more than 124 men were sent. The NSW Army Medical Corps detachment included a half bearer company, a field hospital of 50 beds - all under the command of one Major Williams of Sudan fame. During the South African War the entire medical system, particularly in the British Army broke down on a number of occasions. The central problem was that the bearer companies and the field hospitals largely operated independently. Williams had the foresight to keep his bearers and their transport in the one corps, a practice which most impressed the British. But it was left to a Sergeant Appleton of the Royal Army Medical Corps to present his ideas which, when taken into account with the findings of the British parliamentary inquiry into the medical arrangement of the Boer War, resulted in the creation of the first official field ambulance on the 1st of March 1906. The parliamentary study was in fact a work of monstrous proportions which resulted in among many things an extremely authoritative work of some 700 pages of detailed testimony, records, receipts, reports and returns and one page of recommendations! These included the novel ideas that the Medical Corps should be adequately structured in peace so that it could do its job in war, and the necessity of employing in the higher posts men selected for their merits rather than by seniority!

The South African War also produced a couple of Australian heroes - firstly, a junior Lieutenant, Neville Howse, won a Victoria Cross for his heroic action on the 24th of July 1990 at Vredeport. The other was a well-known bushman poet called ‘Breaker’ Morant. He was really a collapsible hero, and was executed by a British firing squad for the killing of Boer prisoners of war. Unfortunately, our country made a successful movie about Morant but seems to have largely forgotten Howse who went on serve at Gallipoli in World War One, and to become the Director General of the Army’s Medical Services.

World War I

The Great War saw the chain of evacuation change little in any in the three main theatres although some ingenuity had to be applied in satisfying the evacuation requirements in distinctly different terrains. Firstly, at Gallipoli we see rough, mountainous ground which necessitated keeping hospitals on the sea and tucked away on the beaches. Evacuation was extremely difficult and usually, but not always involved man carriage. It was here, nearly seventy-five years ago, that we meet another great Australian, John Simpson Kirkpatrick. Simpson and his donkey enjoy a very special place in Australian military history by epitomising tireless devotion to one’s comrades. Simpson and his donkey laboured for days evacuating the wounded to the beach until Simpson himself was killed by a Turkish sniper.

In another theatre, the Western Desert, the Australian camel corps conducted very successful operations in a most inhospitable environment. Evacuation was by camel pannier which would have pleased Baron Larrey very much indeed. For it was he who had designed such an apparatus nearly one hundred and fifty years before! Finally, in Europe there was the old dependable method of man carriage in the most appalling conditions. The nature of trench warfare dictated that the dressing stations be underground to ensure the survival of the patients and the very unit itself! Many of the level two units developed deployable casualty collecting posts to overcome the very lengthy evacuation times and in order to provide rapid treatment for newer types of casualties such as those suffering from chemical attack.

World War II

World War II, although obviously a mammoth event, contributed little to the development of the field evacuation systems although gross problems of evacuation in the South West Pacific Islands Campaign necessitated action which has great relevance to our considerations for the concept of medical support to future operations. The lesson learnt from Papua New Guinea in particular, was that evacuation by vehicle or animal was impossible and even the old dependable man carry caused unacceptable delays in the evacuation of the wounded. The solution was to move the surgical facilities further forward to the level of the field ambulance which had to be adapted as a consequence. You have already heard this morning, from the Vice Chief, that Slim had come to exactly the same conclusion in Burma and had moved his surgical facilities further forward. This topic will be covered later in the week by people involved in recent United Nations operations so I will expand no further for the time being.

Vietnam

The next conflict we need to examine is Vietnam and the advent of the widespread use of helicopters for forward aeromedical evacuation. The relatively short distances involved combined with a favourable tactical situation, namely persistent air superiority, allowed these resources to be put to very good use. In fact, so effective were they that the field ambulance was often overflown and hence not involved in the casevac chain. Naturally we would hope that this will be the case in future but with the development of cheap and effective shoulder fired surface to air weapons it appears highly unlikely. It does mean however that level two medical facilities must be able to speak to air assets to coordinate incoming casualty arrangements and to organise AME flights out. The other important lesson from the health services point of view is the power of the media. It is unlikely that civil populations will again sit at home and accept casualties in the numbers which were common place in the first half of this century.

The Falkland Islands

Moving forward now to 1982, I would like to draw your attention to the war between the United Kingdom and Argentina over the Falkland Islands in the South Atlantic. This conflict reminded us of the ferocity and horror of naval warfare and the terrible casualties which can occur.

With a tremendously long chain of evacuation from the UK, we were readily reminded of the necessity of hospital ships, that is level three facilities afloat. Another difficult although interesting problem faced by the British hospital ships was the requirement to conform with the Geneva Conventions and Protocols. Specifically, they were required to declare the Red Cross. Quite a reasonable requirement you may say. But the need to show the Red Cross went hand in hand with the requirement to use no electronic communications. So how, you may well ask, were they supposed to operate a casualty evacuation chain between their ambulance and hospital ships, let alone meet the requirements for strategic evacuation back to the UK? To be fair to the framers of the Geneva Conventions and Protocols they could hardly have been expected to predict the development of over the horizon precision guided missiles which are incapable of distinguishing between ships declared with the Red Cross from those which are not! This remains a current, pressing problem and I would invite those of you with maritime experience and interests to address this difficult issue during your deliberations this week.

Gulf War

The second last conflict I wish to concentrate upon is Operation Desert Storm which occurred in the Persian Gulf region during early 1991. I would remind you that this was a joint, combined operation which fortunately ended quite rapidly with a minimum of coalition casualties. In fact the ground war was wrapped up in around one hundred hours following a devastating barrage of both naval and air force indirect guided firepower.

I think all of us would have clear memories of precision guided weapon attacks of unbelievable accuracy and effect. This conflict provided an excellent example of integrated land-air-sea operations. Accordingly, we must expect to operate in a joint environment in future, so our treatment and evacuation plans must, as a corollary, be Joint as well.

In a more general sense this conflict serves to remind us that joint, combined conventional war may arise surprisingly quickly and that we must work very hard during peace to ensure that we are ready should conflict arise so rapidly again. The next point we should bear in mind is the incredible effect that technology has had upon the battlefield - for example, through the development of advance optics such as thermal imagers, and the utility of sophisticated surveillance devices such as unmanned aerial vehicles. In addition, weaponry has become even more accurate and powerful including the precision guided weapons as I mentioned before and also the newer extremely powerful fuel-air explosives.

During this fierce conflict, although enemy casualties far outweighed those of the coalition, there still existed great consternation in the homes of the participants over our own casualties especially those of servicewomen and those due to fratricide.

Many of you would recall Australia’s medical commitment to the US Navy Ship *Comfort*. There, our specialist health team led by Captain Mike Flynn contributed to the overall health effort. Once again we learnt the benefits of interoperability and the virtue of casualty treatment regimes and the benefits of a combined supply of blood.

Peacekeeping

This takes us up to the present to the era of United Nations, and other combined, peacekeeping operations. We have in a sense come the full circle in that once again, like Barron Larrey, we are most concerned about the maintenance of the chain of evacuation. As during the Gulf War we are vitally interested in the joint and combined nature of operations. We are astounded by the advances in modern technology and we are committed to using it to the maximum to avoid friendly casualties virtually at all costs.

Future Health Threats

So what of the future of the chain of evacuation? Firstly, I think we must heed George Orwell’s warning that each generation imagines itself to be more intelligent than the one which went before it, and wiser than the one that comes after it! Naturally, everyone is interested in the future, in what lies ahead, and particularly, this is true in the military. Peering into the crystal ball to discern the future can be interesting, frustrating, tedious and sometimes even humorous, but at all times it is a crucial phase of military leadership. To that end I would now like to turn your attention to some of the initiatives we are taking in the Australian defence force in order to conserve manpower and ensure that the ADF is fit to fight.

There can be no doubt that in the future our soldiers, sailors and airmen will be faced with a variety of health threats. These include firstly occupational threats, which are those posed by our own warfare systems and equipment. Secondly, there will be environmental threats, which are those posed by the specific environment in which our troops can expect to operate. And finally there will be operational threats, which are those posed by an adversary’s warfare systems and weapons.

From the occupational point of view more complex warfare systems place increased physiological and psychological demands on soldiers who operate them. These threats include radiation, heat, vibration, excessive physical loads and effort. Furthermore, sensory overload, mental and physical exhaustion, disorientation and isolation will challenge everybody involved on the future battlefield. To counter human and system degradation, human factors must be considered in the development, fielding, and operation of warfare systems

Environmental analysis indicates that globally, the incidence and prevalence of many infectious diseases of military importance appears to be increasing. Of course historically, disease has been the main cause of personnel losses in conflict. Here I am referring to malaria, dengue fever, hepatitis A and B, AIDS, schistosomiasis and new strains of cholera.

Operational considerations indicate that weapon systems developments will affect wound trauma likely to be experienced by armed forces and will drive the development of appropriate individual and collective protection. Weapon systems available today obviously include the usual small arms, artillery, rockets and bombs. In future, we can expect to see developed and fielded a variety of new technologies including blast effect weapons, enhanced kinetic ballistic systems, new generation flame and incendiary weapons, and non-lethal technologies including acoustic and direct energy weapons such as lasers. Sadly, we must expect and plan for biological warfare which may involve the use of pathogens, toxins, venoms, modified infectious agents, and bioregulators. In addition the threat of chemical warfare will remain and we must be able to counter the effects of nerve, vesicant, choking and riot control agents.

As you are all well aware, technology which can be applied to prevent casualties and enhance casualty treatment is developing at a significant rate. Space based technology is being used to identify and monitor disease threats. Emerging molecular biology, genetic engineering, neuroscience and other technologies will result in new and more effective preventive diagnostic and therapeutic regimes. These include synthetic vaccines and drugs, including prodrugs, monoclonal antibodies, antidotes, immunogens, repellents and pesticides, detoxification compounds, blood substitutes and resuscitative fluids, blood salvage, fibrin glue, neuromodulators, and tailored rations. Emerging biomedical engineering and data transfer technologies include enhanced patient monitoring and resuscitation, and genetic probes for rapid diagnosis. Developments in virtual reality technology are already being applied in medical training and have a major potential application to realistic and efficient training in combat casualty care.

Conclusion

In conclusion, this morning I have provided you a quick historical summary of where many of our most important lessons in military medicine have been derived. I have also outlined some of likely challenges presented by the future battlefield. In forecasting for the future I would like to paraphrase Sir Isaac Newton by saying that:

*If we have seen further it is by standing on the shoulders of giants like Larrey and Letterman.*

We all know that there are many difficult, although possibly rewarding challenges facing our respective Navies, Armies and Air Forces. In the health professions our task is to understand where, when and how our single service, joint and combined forces may operate. It is our challenge to ensure that our troops are fit to fight. And should the day eventuate we must do all in our power to minimise casualties, alleviate suffering and return our troops to well being in line with the wishes of our nations’ peoples. This is a very tall order and an honourable calling and I am certain that you all will be able to meet the challenge.

In closing, I trust that you will enjoy the formal and the social proceeding that we have arranged for you this week. I wish you all well with your individual and collective endeavours as health care providers in the profession of arms.

1. Rossi DG. The 6th Asia Pacific Military Medicine Conference Sydney. Opening Address. *Aust Mil Med* 1996; 5(3):16-20 [↑](#footnote-ref-1)
2. Opening address given to the 6th Asia Pacific Military Medicine Conference, held at the Sheraton Wentworth Hotel, by the then Surgeon General of the Australian Defence Force, Major General D.G. Rossi. [↑](#footnote-ref-2)
3. David Rossi was the Surgeon General, Australian Defence Force, from 1991 until his retirement on 1 July 1996. He was Patron of the Australian Military Medicine Association during that period. [↑](#footnote-ref-3)