

Deployment of orthopaedic surgeons on ADF missions

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IN THE PAST DECADE the ADF has been involved in overseas deployments on peacekeeping/monitoring or humanitarian aid missions. As part of these deployments, a Level 3 (surgical) facility has been deployed on Operation (OP) TAMAR to Rwanda, OP SHADDOCK to Vanimo, Papua New Guinea, OP BEL ISI to Bougainville, OP WARDEN and OP TANAGER to East Timor and OP TREK to the Solomon Islands. A Level 3 facility provides initial wound surgery and mid-to-high intensity nursing care. Initial wound surgery is the first formal surgery available in the area of operations. It involves surgical resuscitation and provides a definitive diagnosis of the casualty's condition.¹

Each deployment required the involvement of orthopaedic surgeons who were Navy, Army or Air Force reservists. These surgeons were tasked to provide medical support to deployed personnel and to be available immediately in the event of casualties. Orthopaedic surgeons are deployed at Level 3 to provide treatment for battleground injuries to the musculoskeletal system and to prevent and treat non-battle orthopaedic injuries. This treatment can be surgical or non-surgical.

As the orthopaedic surgeons deployed on recent missions have all been reservists deployed directly from civilian practice, questions arise as to whether present training prepares them for their intended role and whether overseas deployments are a suitable substitute for military surgical training. In this article I review these questions with the aid of a historical perspective, as well as an analysis of recent experience.

The Vietnam War

The war in Vietnam is the most recent war that Australian troops have fought on the ground, and that conflict continues to hold lessons for the ADF in terms of how conflicts in the Asia-Pacific region may unfold.

The initial Australian involvement in Vietnam began with ADF training teams, followed by a single battalion of combat troops in May 1965. 1 Battalion Royal Australian Regiment (1 RAR) was dovetailed into the US 173 Airborne Brigade in Bien Hoa to defend that town's airstrip. From July 1965 to April 1966, injuries formed 23.6% of hospital admissions (16.8% battle casualties and 6.8% non-battle casualties). Fifty-one casualties were evacuated to 4 RAAF Hospital in Butterworth, Malaysia. Of these, 23 developed wound sepsis, mostly among soldiers with severe wounds, notably mine injuries.³

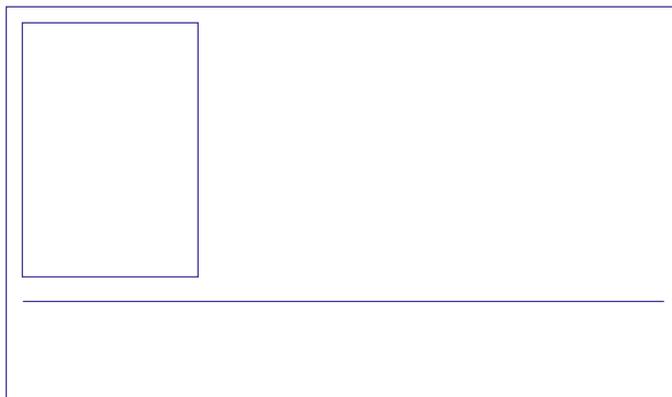


Specialist reservists in their tent in Dili, East Timor. Peacekeeping deployments offer an opportunity for reservists to go beyond their civilian practices and develop the improvisational skills they need for military duties. Left to right: Wing Commander James Bradley, Lieutenant Colonel Ross Mills, Captain Tim Humphery.

Synopsis

- ◆ Australian military surgical services have a proud history of supporting their frontline combat units, coping with large numbers of severe casualties in difficult and primitive field conditions.
- ◆ Recent peacekeeping deployments have provided limited opportunity to train under conditions approaching those of combat: a limited number of battle casualties have been treated, but under nothing like the mass casualty pressure that war produces.
- ◆ Deployments have provided useful experience and training for deployed surgeons superior to planned exercises in Australia: deploying in foreign countries, setting up in hostile environments with limited equipment, dealing with unexpected and unusual injuries, and combining reservists with regular personnel.
- ◆ The humanitarian aid function of recent surgical deployments is a valuable part of the satisfaction of medical personnel within the ADF and of the Australian public with the ADF, but may perhaps distort the overall aim of surgical support to the ADF and dilute the "warrior ethic".

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The potential for massive casualties

On 19 July 1916, over 10 000 Australian troops of the 5th Australian Division were launched into battle at Fromelles, France.

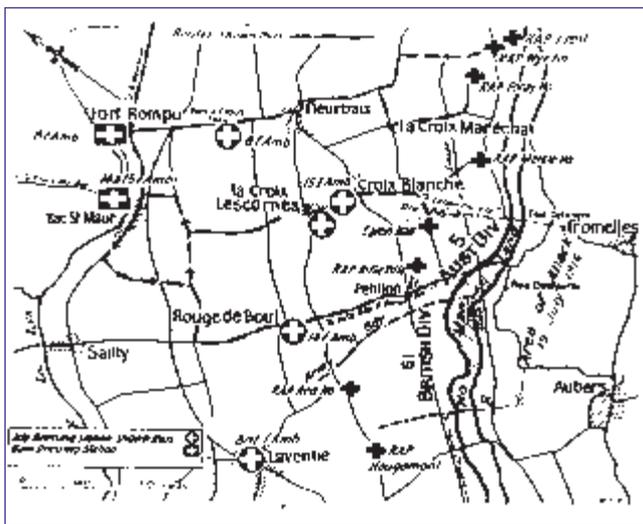
The objective was to capture a German salient, which was a slight rise that had been developed as a machine-gun fortress, as a “feint” to take pressure off the British troops involved in the Battle of the Somme.²

The assault was unsuccessful and there were heavy casualties. The initial artillery bombardment to prepare for the infantry attack left the German machine-gun posts intact. Only two brigades reached their objectives. They spent the night trying to consolidate, but in the morning found themselves partly surrounded and had to fight their way back across no-man’s land “with appalling loss”.²

Medical arrangements for the attack (shown on the map) included Regimental Aid Posts (Level 1) and field ambulances (Levels 2 and 3) situated much closer than usual to the battle. Twenty-one motor ambulances had been lent to the 5th Division. The field ambulance at Bac St Maur consisted of wards with ample supplies of stretchers, splints, dressings, blankets, etc. These arrangements were overwhelmed by the unexpectedly heavy casualties. At first there was rapid evacuation by the motorised ambulances, but this delivered casualties to an area of congestion in the “zone of hand carry”. In 56 hours, 1701 men were killed in action, and 3277 wounded passed through the main dressing stations (817 walking wounded, 908 sitting, 1552 stretcher cases). Sixty-three per cent of injuries were musculoskeletal.²

This tragic episode was all too typical of battle and its aftermath in World War I. Today the weapons and the types of injuries sustained by troops may have changed, but the potential for large numbers of casualties in a short time has not disappeared. Recent ADF deployments have not involved massive casualties, but military surgical training must continue to address this possibility.

Scheme of clearance from Fromelles sector, July 1916 (Source: Butler AG, Official history of the Australian Army Medical Services 1914-18. Reproduced with permission of the publisher, the Australian War Memorial).



In March 1966 the Australian military commitment was expanded to two battalions, which were based in Phuc Tuy, with logistic support elements based 30km to the south on the Vung Tau Peninsula. 2 Field Ambulance was established at 1st Australian Logistic Group (1ALSG) in Vung Tau and steadily developed into a surgical facility dealing with Australian battle casualties.

The workload was variable, but could be extreme. In February 1967, mass casualties from three separate incidents arrived almost simultaneously and exposed the limitations of the operating theatre (three operating tables in a single Kingstrand hut).

Battle casualties in Vietnam presented problems not previously encountered in armed conflict by Australian Army medical personnel. Helicopters delivered the wounded to 2 Field Ambulance about 20 minutes after injury. Some of these soldiers were severely shocked, but alive, whereas in previous conflicts they would have died before reaching a major medical unit. Modern weapons were producing severe multiple contaminated wounds with much greater tissue damage than previously experienced. Surgery was frequently performed at the same time as resuscitation.

From 1 June 1965 to the end of 1966 (19 months) 220 battle casualties were admitted to hospital, about two or three each week. Six died after admission due to very serious wounds to the head and/or abdomen.³

8 Field Ambulance relieved 2 Field Ambulance in April 1967. In late 1967, the ADF deployment was increased to three battalions, or a total of 8000 personnel. One hundred and seventy-one battle casualties were admitted over a period of six months (4 Sept 1967 to 3 March 1968), about 6–7 each week. There was only one fatality, but it should be noted that very severely wounded soldiers with poor prognosis were admitted to US facilities.

1 Australian Field Hospital commenced duty at Vung Tau on 1 April 1968. Its operating theatre had three tables. The permanent triage area was set up to take six simultaneous litter patients and could expand to 14 or 16 litter patients when necessary. In practice, no more than eight casualties could be dealt with at any one time.³

An increase in use of fragmentation weapons such as rocket-propelled grenades and mines resulted in a doubling of battle casualties from March to August 1969 compared with the previous six months.

Battle casualties accounted for 33.1% of all admissions in 1969. In October 1969, 36 Evacuation Hospital, the major US medical facility in Vung Tau, closed, requiring ADF surgical facilities to cope with all casualties, including severe injuries previously treated by the US facility. By mid-1970, 1 Australian Field Hospital was composed of Citizen Military Forces specialists serving short tours, and National Service doctors acting as general duties Medical Officers. Many arrived in Vietnam direct from civilian practice and had little knowledge of military medicine or surgery when they encountered their first battle casualties.

The Vietnam experience shows that an orthopaedic military



Left: Burnt vehicles and houses in Dili, East Timor.
Above: Burnt ambulances in Bougainville.

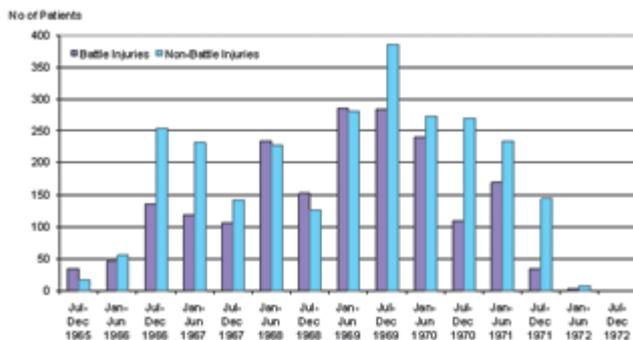
surgeon can expect casualties with severe multiple injuries after contact between Australian and enemy forces. Injured personnel may be delivered by helicopter less than 30 minutes after wounding, “in extremis”, and in sufficient numbers to overwhelm the facilities. The surgeon must be trained to prioritise the problems and operate in substandard conditions for long periods, rapidly dealing with each patient but following proper military surgical standards.

In Vietnam, survival rates from wounding were good compared to those in previous conflicts, and the CMF specialists did an excellent job once they had had a few weeks’ experience in the field.

After Vietnam

The ADF has deployed surgical teams out of country on six operations since 1994, none of them combat operations. Do these deployments provide genuine military training and experience for civilian reservist surgeons? My opinion is based on

Battle and non-battle injuries in Vietnam among Australian troops



Based on data reported by O’Keefe and Smith.³

my experience as a reservist deployed on six occasions in three such international operations.

OP TAMAR to Rwanda provided a surgical facility in support of UN troops and employees in a country polluted with mines and menaced by rival armed factions. Injuries from weapons continued to occur, particularly among local Rwandans, who were admitted to the UN Military Hospital. Battle injuries resulted from mines, gunshots and grenades, and contributed about 20% of all surgical cases. This offered considerable experience in treating wounds caused by weapons, but was significantly different to the overwhelming workload that arrives after a major engagement.

OP SHADDOCK to Papua New Guinea provided support after the tsunami which struck Sissano and Aitape on the north coast of Papua New Guinea in 1998. I was deployed 48 hours after the initial deployment and helped treat the last of the patients with acute injuries who were undergoing initial wound surgery. At the same time, the first patients to receive treatment were undergoing delayed primary closure and skin grafting. All patients presented with open wounds, sustained several days previously and now contaminated and infected. Some had associated fractures. These wounds were comparable to wounds from military weapons needing initial wound surgery. The patients presented in large numbers over a short period, creating a mass casualty situation in a remote area. They were treated by a deployed Level 3 surgical facility, which in many ways faced problems like those after combat with multiple casualties.

OP WARDEN to East Timor was a United Nations-sanctioned peacekeeping mission launched in September 1999 in response to the violence that followed East Timor’s independence vote. I joined OP WARDEN a few months after the International Force East Timor (INTERFET) deployment. I worked in the military hospital in support of INTERFET, where a restriction had been placed on the treatment of local East Timorese citizens, creating a very different workload to

that experienced on the mission to Rwanda, when local Rwandan citizens were frequently treated. In East Timor, peacekeeping was firmly in place by the time of my deployment and the familiar causes of civilian trauma, such as falls from height and motor vehicle accidents, were the most common causes of injuries requiring surgical treatment.

Each of these missions presented different training opportunities. The orthopaedic surgeon deploying with the ADF in contemporary peacekeeping/monitoring missions will gain some experience of battle injuries, but most cases will involve acute trauma and routine orthopaedics similar to those treated in civilian orthopaedic practice in Australia. It is uncommon for mass casualties to present simultaneously and it is rare for these casualties to be the result of weapon injuries. Certainly my experiences do not resemble those of the medical officers of World War I, or even those involved in the smaller conflict of the Vietnam War.

Positive training aspects of deployment

ADF surgeons have seen limited numbers of mine, high-velocity rifle and grenade injuries during deployments over the past 10 years. An increase would be most unwelcome, but the cases that have occurred provide a rare experience not available in civilian practice and reinforce old principles of primary wound debridement and delayed closure. Such experience is invaluable and should not be underestimated. However, the missing elements are the pressure of time and casualty numbers that might be encountered in a combat zone.

The experience of working with limited equipment in facilities such as open tents, air-conditioned containers or commandeered public buildings teaches specialist reservists the unique circumstances of military surgery. Setting up a surgical facility in the unfamiliar terrain of a foreign country will always provide better training for all personnel than the controlled situation of an exercise in Australia.

Each of the recent deployments has differed in the size of the ADF deployment, the numbers of medical personnel and the size of the field hospital. The reservist has had to modify expectations and techniques to meet the variations in facilities, equipment and personnel available for ADF surgical support. Routine trauma and orthopaedic cases treated in deployed surgical units can provide this experience as successfully as battle-injured patients. It is better to be gaining this sort of

Orthopaedic surgery cases in Rwanda over six weeks*

Trauma (non-battle)	25
Battle injuries	10
Dressing change	
Battle injuries	3
Routine	5
Osteomyelitis	6
Routine orthopaedics	3
Total	52

*Orthopaedic surgery cases treated by the author during OP TAMAR.

Orthopaedic surgery cases in East Timor over 30 days

Trauma (non-battle)	18
Battle injuries	2
Routine orthopaedics, dressing change	19
Total	39

*Orthopaedic surgery cases treated by the author during OP WARDEN.

experience in a real situation than to be practising and theorising at home.

There have been no examples of mass casualties presenting with battle injuries in recent deployments, but there have been mass presentations of non-battle casualties, particularly at Vanimo, Papua New Guinea, and also in East Timor (on one occasion a bus accident in East Timor delivered 14 local civilian casualties to the military hospital in Dili). The controlled situation of an exercise cannot reproduce this severe test of a hospital's preparedness.

Overseas deployments also provide the opportunity for specialists to work with full-time medical personnel from all three Services and personnel from non-medical units, learning more about their various roles and functions within the ADF.

Training limitations of peacekeeping deployment

The surgical experience on a peacekeeping mission is not a replica of that acquired in supporting a combat mission.

The nature of the injuries seen is different, consisting predominantly of routine trauma normally encountered in civilian practice.

Local civilians often present different problems from ADF members. They:

- are slower to arrive at the facility,
- present different fracture patterns,
- present unusual industrial injuries because of lower standards of occupational health and safety,
- do not have the same underlying fitness and wellness as ADF personnel
- often present with concurrent debilitating systemic illness such as malaria or tuberculosis.

Even the battle injuries of the local population have subtle differences, such as wounds inflicted by low velocity rifles or home-made grenades or firearms, complicated by delayed admission to the surgical facility. The mine injuries are identical to those found in any armed conflict, with major soft tissue damage requiring widespread debridement and delayed primary closure.

However, no orthopaedic surgeon who has deployed recently with the ADF has had to cope with large numbers of battle casualties presenting simultaneously.

Humanitarian aid: a different mission

ADF surgeons are well briefed that the primary purpose of



The humanitarian face of the ADF Health Service: Left: Warrant Officer Peter Matthey with an East Timorese orphan. Right: Injured in Vanimo, Papua New Guinea, being prepared for surgery in the "preoperative facility".



their mission is surgical support for ADF and UN personnel, but there is also the expectation that there will be a certain amount of humanitarian aid to the local population. Most surgeons are accustomed to long and hard hours of work and most like to be fully occupied. They also genuinely wish to be useful and look forward to challenging and interesting surgery that is different from their usual routine. Most would prefer to be involved in more humanitarian aid for the local population.

It has been suggested that more humanitarian aid work may attract more surgeons and other medical staff to join ADF deployments as reservists, but this would require the ADF to transport equipment that is unnecessary for supporting service personnel (eg, paediatric equipment, obstetric and gynaecological instruments, routine orthopaedic instruments and implants). The cost and space required for this effort may actually reduce the ADF's readiness for a combat role. It is already the case that medical units have a restricted call on ADF transport, forcing them to carefully consider what is "essential equipment". The need to take equipment which is not relevant to support for military personnel will lead to even greater compromise.

More emphasis on humanitarian aid will distort the allocation of scarce defence resources away from the primary purpose of surgical support for the ADF. Will it weaken the combat organisation and mindset of the ADF health services?

The perception of the ADF by the general public can affect its role. ADF operations which assist civilians, such as tsunami and famine relief in Papua New Guinea, flood relief in New South Wales, air-sea rescue by RAN and RAAF and support during the Sydney Olympics, gain favourable coverage in the media and improve public support for the ADF. Will the desire of the Australian public and their politicians to increase the humanitarian role of the ADF weaken the stated mission of the health services to support combat troops defending Australia?

The ADF medical commitment to OP BEL ISI and OP TANAGER has now been in place for several years and will continue. The character of these deployments is slowly chang-

ing, with less military support and more assistance to the local population. Medical resources will be consumed, more will be needed for humanitarian aid, and there may be less available for future combat support.

This is also true for human resources. Most specialists are in private practice and the frequency of deployment must be limited because of career, family and financial commitments. There is a risk that the present deployments will absorb the specialist reservist's availability and commitment and produce deficiencies should a more desperate military crisis occur.

The influence of the United Nations should also be considered. The UN seeks long-term commitment to peace-keeping deployments, requests equipment for medical services not needed by the ADF and sets objectives which do not match the stated mission of ADF Health Services. The UN has different objectives to the ADF, which may take precedence when the ADF deploys under UN command. This can include tasks for the medical units and equipment provided by the ADF. At present the UN does not regard deployed armed forces as responsible for the health care of troubled countries being assisted by the UN, but any change in this policy will impact on planning the health services of the ADF.

These issues may remain open for consideration for a considerable period: UN peacekeepers were sent to Cyprus in 1964 and are still there now.

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