

The Evolution of Operational Health Support Provided to United States, United Kingdom and Australian Special Operations Forces from 1940 - 2024

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Introduction

Over the last 85 years, medical support to Special Operations Forces (SOF) units has evolved from rudimentary beginnings to highly sophisticated care. While some of this evolution reflects changes in clinical medicine during that period, particularly in civilian trauma management, the progress in health support in other areas reflects the innovative forefront of military medicine. In most instances, SOF units initially adopted these innovations before rolling them out to conventional military units. They have occurred principally in four key areas: 1) the use of combat or patrol medics in providing immediate casualty care; 2) aeromedical evacuation; 3) trauma combat casualty care; and 4) the introduction of specialised trauma equipment and treatments. As with all accounts of special forces operations, histories of medical support to SOF units are often imperfect and suffer from the challenges posed by limited access to suitable unclassified operational information, incompleteness of records and limited personal accounts of the combatants, particularly about medical aspects, which make the accuracy, veracity and effectiveness of medical support to such operations difficult to assess and evaluate.¹ This paper reviews the effectiveness of the medical support to the SOF units of the United States (US), the United Kingdom (UK) and Australia during and after World War II, focusing on those SOF units that operated small teams in the field. The availability of accurate and complete unclassified information on SOF medical operations, particularly over the last 20 years, does limit some of the details that can be provided. However, sufficient data and sources are available to evaluate the effectiveness of the provided medical support.

Early days

The special forces in World War II had limited medical support. Early attempts by the Office of Strategic Services (OSS) personnel in France to use medical staff from local clinics or hospitals proved unsatisfactory, given German military surveillance of these facilities.² A series of makeshift hospitals in houses or barns were created, with medical supplies from Allied air drops.² Staffed by local doctors and other health staff willing to assist the resistance, these facilities provided temporary safety and could manage most injuries or illness except for the most serious cases.² While there was generally no medical personnel with the special forces, such as the Jedburgh teams, in France, small numbers of US and British medical officers operated makeshift hospitals behind German lines in Greece and in support of the partisans in Yugoslavia.²⁻⁴ Although often hampered by a lack of medical supplies, these clandestine facilities were effective in improving morale by saving the lives of both resistance and special forces personnel.² Medical officers and orderlies also served with the Long Range Desert Group and Special Air Service Brigade in northern Africa, Italy and the Adriatic, including during the raid on Benghazi in September 1942, often in very austere settings and with limited ability to move casualties to definitive care.^{5,6} Medical orderlies usually deployed with the patrols to provide advanced first aid, while the medical officers and senior non-commissioned officers (NCOs) established casualty collecting and aid posts to provide advanced medical care to casualties from the multiple patrols.⁶ Evacuation was often difficult, done at night and utilised sea or air platforms, where possible. However, most aeromedical evacuation was reserved for transferring stable patients back to definitive care in their home

countries.^{6,7} Highly trained medical officers and orderlies generally proved effective in maintaining combatant health and managing the casualties from special operations.⁶

Medical training and support

With the activation of the US 10th Special Forces Group on 11 June 1952, the US Army Medical Department moved quickly to establish training for SOF medics, with the first course in November 1952.³ The focus was on training the medics as independent 'physician substitutes' to operate in warfare situations.³ The assigned Army Medical Officers were instrumental in guiding the medical training and maintaining the medics' clinical proficiency.^{3,8} The move of the 10th Special Forces Group to Bad Tölz in Germany enabled the medics to receive more practical training at cooperating military hospitals.^{3,8} By 1959, however, with the addition of 77th Special Forces Group in 1953 and 1st Special Forces Group in 1957, there was no central medical guidance being provided on what training was required after completion of initial training and no standardisation between the Groups.³ While the surgical research laboratory provided some effective 'hands-on' training, the requirement for special forces advanced medical training was becoming more critical, particularly as medics were now preparing to deploy to Laos in 1960.³ With the support of the Army Surgeon-General, Lieutenant General Leonard Heaton, Advanced Medical Training was commenced at Fort Bragg in 1962.^{3,9} During the Vietnam War, these medics carried out triage, immediate advanced first aid, wound surgery and anaesthesia, as well as looking after the needs of the Special Forces Group and their Montagnard allies.^{10,11} The medical support to insurgent forces also assisted in maintaining them as a viable fighting force.¹² During Blackjack 21 in October 1966, a special forces surgeon and four medical sergeants were able to successfully provide medical care in the field when aeromedical evacuations were unavailable.¹³ Throughout the Vietnam War, special forces operations placed increased responsibility on enlisted SOF medics, particularly where medical evacuation was not immediately available, which required more physician oriented training.³ During 1967, a special forces clandestine hospital was trialled, which, while not adopted, highlighted the difficulties with medical supply, limited diagnostic equipment, the tactical impact of casualties, and the need for preparatory training for assigned physicians.^{2,14} By 1992, the SOF medic was required to have completed 58 weeks of specialist medical and special forces skills training prior to joining a team.¹⁵ In the team, the medic was

required to provide comprehensive medical support without logistic, physician or medical evacuation support.¹⁵ The nearest physician support was provided from an often distant battalion headquarters with limited radio communication.¹⁵ The Joint Special Operations Medical Training Center at Fort Bragg in North Carolina now trains medical NCO's with the knowledge and skills required by the SOF to provide the necessary medical treatment, regardless of the conditions.

In the British 22 Special Air Service (SAS) Regiment, medical support in Malaya between 1950 and 1959 was initially self-taught or taught by those soldiers with some health background.¹⁶ As SAS medical officers deployed, they trained a member of the platoon in first aid and could be contacted by radio, with evacuation organised by helicopter.¹⁷ SAS medical officers also parachuted in to attend to casualties, although this was quite hazardous.¹⁷ When the SAS first deployed to Oman in 1958, they were supported by a SAS medical officer on base.¹⁸ A Field Surgical Team (FST) based at the operational headquarters could provide additional support when required, such as during the fighting around Nizwa in November 1958.¹⁸ By 1962, one of the members of the SAS team doubled as a patrol medic, and was acquiring expertise in paramedicine.¹⁶ A medical officer was posted to the SAS Regiment, who had the responsibility for basic medical training of the SAS personnel.¹⁹ The patrol medic training was usually 12 weeks, including a six week placement in the emergency department of a civilian hospital.²⁰ In August 1970, as part of the SAS deployment to Oman, SAS patrol medics established field clinics to treat local Omanis.^{16,21} Immediate care was also provided by patrol medics, with casualties transferred to the Army Field Surgical Unit at the base camp.¹⁶ During the battle of Mirbat in July 1972, SAS medics provided extended trauma care to both military forces and Omani civilians.²⁰ They eventually received support from the 55 FST, but there was no aeromedical evacuation capability until after the battle.^{21,22} By 1973, the UK was looking at how this training could be improved to bring it more in line with US Special Forces medic training.¹⁹ By the 1991 Gulf War, SAS medics were well entrenched in the deployed teams in Iraq, where they treated wounded enemy as well as troop members, although aeromedical evacuation was limited.¹⁶ Royal Army Medical Corps Combat Medical Technicians of Medical Support Unit now provide close medical support for UK Special Forces, having completed the 'Black Serpent' training course.

Created in July 1957, the Australian SAS Regiment was deployed to Borneo in 1965 and 1966 during the Indonesian Confrontation.²³ Their medical support was similar to that provided to the British SAS.²⁴ Casualties were initially treated by a troop member before being evacuated by a helicopter authorised by the regimental medical officer (RMO).²⁵ In preparation for deploying to Vietnam in 1966, a patrol medic would do a 6-week course at Healesville School of Army Health and 6 weeks of consolidation training in Papua New Guinea before deploying.²⁶ This training was supplemented by further medical training at Swanbourne Barracks by the RMO and senior medical NCOs.²⁷ In Vietnam, casualties were usually evacuated to safety by other members of the team until they could be extracted.²⁶ SAS medical officers and patrol medics continued to support the SAS during operations after the Vietnam War, including during the United Nations Assistance Mission to Rwanda in 1994, deployment to Kuwait in 1998 and East Timor in 1999.^{24,28}

Aeromedical evacuation

While aeromedical evacuation was in its infancy during World War II, the Korean War demonstrated the utility of helicopters in rapidly transferring patients from the battlefield to a health facility that could provide definitive treatment, including lifesaving surgery.⁷ Compared to the Second World War, helicopter evacuation, increased antibiotic use and improved surgical techniques almost halved the death rate from wounds.⁷ The Vietnam War saw further enhancements in aeromedical evacuation (AME), with US DUSTOFF helicopters able to deliver wounded soldiers to military surgical facilities in a minimum of 20 minutes.²⁵ Both the US and Australian forces moved to use trained medical assistants to accompany the casualties.²⁵ In Operation Just Cause in Panama in December 1989, special and conventional force casualties were evacuated to the Joint Casualty Collection Point (JCCP) at the Point Hood Air Base.²⁹ During the operation, over 99% of casualties who arrived at JCCP survived.²⁹ During the 1991 Gulf War, the US forces continued to use flight nurses and AME medical staff to accompany patients. However, readily accessible large military hospitals ensured rapid investigation and stabilisation of casualties.⁷ In Afghanistan, given longer distances required for the aeromedical evacuations, critical casualties averaged over 3 hours or longer to get to hospital, such as the eight serious casualties from the Kajaki Dam bomb blasts in September 2006.⁵ In 2008, the then US Secretary of Defense, Robert Gates, mandated the medical evacuation time between injury and surgical

intervention to be less than 60 minutes.³⁰ While the SOFs were exempt from this restriction due to tactical limitations, the improvements in medical evacuation times contributed to improved outcomes. Enhanced Medical Emergency Response Teams (MERT) were deployed by British Forces in 2006 to stabilise and transport casualties from the point of injury, which reduced morbidity and mortality.^{31,32} The enhanced MERT, which generally included a military doctor, nurse and paramedics, could deploy on various aerial platforms and was instrumental in introducing new trauma procedures and equipment into the battlefield.³¹ These included the capability to provide blood and plasma transfusions, supply adequate quantities of oxygen and conduct advanced airway and chest procedures to stabilise and transport casualties.³¹ The US Air Force utilised PEDRO forward AME teams, which included emergency medical technicians and paramedics rather than physicians.^{33,34} Various trauma studies showed that aeromedical platforms that provide advanced medical care were more successful than those providing basic first aid.³⁴

Trauma training

From the lessons learned from the Vietnam War, the Gulf War and Somalia, there was an increasing realisation that the civilian trauma training provided to military doctors through the Acute Trauma Life Support (ATLS) course poorly prepared them for modern conflicts, particularly for managing extremity haemorrhage and penetrating wounds in an austere setting.³⁵⁻³⁷ During the Vietnam War, the US Wound Data and Munitions Effectiveness Team (WDMET) reviewed over 8000 US casualties between 1967 and 1969.^{38,39} Despite the emerging 'golden hour' principle in civilian trauma management, WDMET showed that up to 70% of combat casualties died within the first 5 minutes.³⁹ There also had been minimal change from Vietnam to the 1991 Gulf War in medical equipment, procedures, drugs or tactics used for battlefield casualties, with SOF medics providing advanced first aid to injured soldiers and major trauma care only being delivered after arrival at a major health facility.^{40,41} A review of the US Special Forces casualties during Operation Just Cause in Panama in 1989 highlighted that appropriate control of limb haemorrhages, particularly the use of tourniquets, had the most significant impact on casualty outcomes.⁴²

The Tactical Combat Casualty Care (TCCC) project was commenced in 1993 by US Special Forces. The initial guidelines were published in 1996.⁴³ These guidelines were first taught in late 1996 and rapidly became mandatory for US Special Forces doctors

and medics.⁴⁴ In parallel, the British Special Forces community in 1992 reviewed its pre-hospital trauma medical support and developed the Combat Trauma Life Support (CTLS) program.^{43,45} The British Army had learned some important lessons from the Falklands War in 1982 about forward trauma care and evacuation and replaced ATLS in the late 1980s, and eventually CTLS, with the Battlefield Acute Trauma Life Support Course (BATLS), pioneered initially by Brigadier Ian Haywood.⁴⁶ The Falklands campaign also highlighted the need for Forward Intensive Resuscitation and Surgical Teams.⁴⁶ BATLS effectively demonstrated its benefits during British military operations during the 1991 Gulf War. However, low casualty flow rates made it difficult to assess its effectiveness and mass casualty events during the Balkan conflicts in the 1990s.^{32,47}

US Special Forces regularly reviewed and progressively adopted TCCC guidelines.⁴⁴ The guidelines also accounted for the tactical situation. They were designed to ensure that mission success was achieved by 'doing the right thing at the right time' when responding to casualties.⁴⁸ By 2011, US combat medics and corpsmen were being taught trauma care based on the TCCC guidelines, and Australia, Britain, Canada and New Zealand were recommending its use across their respective militaries.⁴⁹ TCCC treatment has been a major factor in reducing fatalities in recent conflicts in Iraq and Afghanistan, in concert with improved body armour, definitive surgical treatment and rapid evacuation.^{35,49,50} While there are challenges comparing combat casualties between conflicts, the survivability of those injured in battle in Iraq and Afghanistan was 90%, compared to 84% in Vietnam and 80% in World War II.^{50,51} Of the conventional forces deaths in the field, 75.7% had nonsurvivable injuries, and 24.3% were potentially survivable, primarily if haemorrhage could be controlled.⁵¹ There was also improved survival from traumatic events throughout these conflicts.³³ In US Special Forces units utilising TCCC guidelines, preventable fatality rates were even lower. In the first 3 years of operations in Iraq and Afghanistan, over 85% of casualties survived, with only 15% of the fatalities due to potentially survivable injuries; 66% of the preventable deaths could potentially have been averted if the TCCC guidelines had been applied consistently.⁵² In the 75th Ranger Regiment's operations in Iraq and Afghanistan, 92% of casualties survived, and the number of preventable deaths due to failure to provide appropriate care was less than 3%.^{37,49} To further address these potentially survivable casualties, Special Operations Resuscitation Teams (SORTs) were initiated in May 2004 to provide additional

critical care support further forward in the field, particularly in restrictive operating environments.^{53,54} In mid-2008, the SORTs resuscitated more than 80 casualties in Afghanistan over 4 months.⁵³ These were subsequently supplemented by Forward Resuscitative Surgical Teams (FRSTs) of five to eight personnel who were trained to provide damage control surgery on unstable casualties who could not be moved.⁵⁵ The efficacy of these teams is still being reviewed.⁵⁶ By 2009, Australian SAS doctors and medics were being trained in and successfully applying TCCC principles in support of Australian Special Operations Command forces in Afghanistan. They were routinely attached to the US aeromedical wing for special operations.^{57,58} Training has been refocused on providing decisive medical intervention to any casualties within 10 minutes ('platinum ten').⁵⁷

In 2015, as the US involvement in Afghanistan and Iraq decreased, the US Special Operations Command sought to develop a systematic approach to Prolonged Field Care (PFC).⁵⁹ There was a particular emphasis on using PFC where the SOF are operating in austere, remote environments, usually only with a combat medic, and have minimal access to medical evacuation or definitive clinical care.^{30,59} PFC concepts have been progressively introduced in these settings, emphasising pain control, basic anaesthesia and teleconsultation, and the medical equipment required to enact them.³⁰ These trauma techniques have also become important in conflicts with contested air space, including where surveillance and armed drones are being used, such as the current conflict in Ukraine.^{59,60} Clinical outcomes are expected to be worse with PFC than currently achieved.⁶¹

Pre-hospital casualty care

While the improved training had been overdue, there was also a revolution in pre-hospital casualty care, particularly during the operations in Afghanistan and Iraq, where the special forces were early adopters.^{31,40} The US Special Forces were the first to deploy tactical tourniquets and, after increasing extremity haemorrhage deaths in Iraq in 2003, to require combatants to carry them.³¹ The British SAS also started deploying with tourniquets.²⁰ New dressings to stop arterial bleeding, and reflective blankets and chemical heaters to manage hypothermia were also adopted.^{31,34} A review in 2016 of US casualties in Afghanistan, including special forces, showed that, despite evidence that explosive devices were increasing the complexity and severity of injuries, reductions in pre-hospital transport time and improvements in trauma treatments had significantly improved casualty survival.⁶² Improved

damage control resuscitation on arrival at the acute treatment facility, coupled with surgical haemorrhage control and transfusion with whole blood cells, have also improved clinical outcomes.⁶³

Conclusion

Medical support of any military unit requires dedicated, well-trained personnel, an appreciation by the unit leadership of the benefits that arise from this support, and a willingness of both the military and medical hierarchy to adopt new techniques, equipment, training and health delivery arrangements. The review of medical support to US, UK and Australian SOF units highlights a progressive evolution of the support expected and provided since the early part of World War II. This has not been without its hiatuses. During the 1980s and the lead-up to the 1991 Gulf War, military pre-hospital trauma care had stagnated in all three countries.^{43,45} The development of tactical or battlefield casualty care in the early to mid-1990s dramatically affected the survivability of battlefield injuries.^{33,49} Improved survivability during forward aeromedical evacuations in deployments in Iraq and Afghanistan also improved with the roll-out of

enhanced MERT after 2006 and increased use of PEDRO AME teams.^{31,64} The maturing of the patrol or combat medic concept and the early introduction of lifesaving techniques and therapeutic goods to stabilise patients, particularly since 2000, has also contributed to improved outcomes.⁶³ As outlined in the Introduction, the availability of accurate and comprehensive unclassified information on SOF medical operations over the last 20 years limits the detail and the assessment of the full effectiveness of medical support during this period and warrants further research.¹ The new focus on PFC in more recent times indicates that medical support continues to evolve to address future threats to special forces operations, particularly to drone warfare and in contested airspace.⁶⁰ On all measures, medical support to special forces operations has improved and become more effective over the last 85 years.

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