

MILITARY TRAUMA MANAGEMENT

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The Military trauma management experiences in the 50's and 60's were some of the catalysts for the development of EMS systems worldwide. How is the Australian military managing trauma in light of the recent experiences in Rwanda and Papua-New Guinea?

INTRODUCTION

1. The management of trauma in armed conflict in the early twentieth century, tended to be non-urgent due to the delay in evacuation of the casualty. It was not uncommon for a critically wounded casualty to lie unattended and exposed to the elements. This, coupled with the extreme delay in removal from the battlefield, ensured that the wounded had either succumbed to their injuries or stabilised. In Vietnam, access to aeromedical evacuation reduced the time, from wounding to treatment to less than one hour. As a consequence of the increased demands associated with a more efficient evacuation chain, larger numbers of severely injured casualties required resuscitation.

2. Research has shown that there is a trimodal distribution of death following injury. The first trimodal area describes immediate death, and death occurring within minutes; it is a consequence of severe major organ injury, and low level intervention is usually ineffective. Records show, the second trimodal area (occurring within several hours), results from conditions usually responsive to medical and basic surgical intervention. Sepsis and complications can occur days to weeks after the event, giving rise to the third peak of the trimodal distribution.

3. It is the second peak that is the focus of resuscitation. Due to the markedly improved outcome with intervention, resuscitation aims to promptly assess and treat casualties. The Australian Resuscitation Council Guidelines are the gold standards for resuscitation in the civilian health sector, and are equally applicable in the military. In the

ADF, for resuscitation to be effective, the procedures must have been rehearsed and the facilities and equipment must be appropriate.

4. Wherever resuscitation is undertaken, the following principles should be observed:
 - a. The limitations of resuscitation at each level of medical support must be recognised and evacuation must not be delayed because of them.
 - b. The performance of resuscitation must be prompt and efficient.
 - c. The process of resuscitation must be clearly and accurately documented.

5. During the processing of casualties, four general tasks are carried out. These are:
 - a. Reception and prioritisation (Triage),
 - b. Assessment and initial treatment (Resuscitation),
 - c. Documentation, and
 - d. Referral (transfer or evacuation)

6. While sharing some of the features of civilian trauma casualties, military casualties can be distinguished by:
 - a. the nature of the presenting trauma,
 - b. the number of casualties,
 - c. the relatively austere conditions under which treatment is performed,
 - d. the limited availability of resources for the evacuation of casualties, and
 - e. the absence of some of the more advanced equipment found in major civilian hospitals.

7. Historical data relating to seriously wounded battle casualties, indicates that there is a substantial increase in the mortality rate of those who do not commence definitive treatment until four hours after wounding. There is a further dramatic increase between the sixth and seventh hours. Australian Defence Force doctrine therefore requires military operational planning to ensure, wherever possible, that seriously wounded or injured

casualties can commence definitive treatment in an appropriate facility within three hours of wounding.

8. This requirement is met by deploying appropriate assets and judicious siting of facilities. These facilities have to cater for casualties in the numbers and types projected in casualty estimates. They also provide an effective system of triage for directing casualties to whichever facility is best able to cope with the conditions presented.

LEVELS OF HEALTH SUPPORT

9. Health support in military operations is based on a hierarchical system of casualty management. This involves five levels of treatment. I am only going to talk about three of the levels as they relate to the system of casualty management utilised in the civilian health sector.

- a. **Level One.** The first level in the hierarchy includes the location and removal of casualties from danger, and the provision of immediate first aid. It may involve self or buddy aid, examination and emergency life saving procedures such as maintenance of airway, control of bleeding, prevention and control of shock, and prevention of further injury. (First person at the scene) It may include treatment at an aid post or similar facility with trained medical personnel where treatment could include restoration of airway, use of intravenous fluids, antibiotics, and the application of splints and bandages.
- b. **Level Two.** The next level is the collection, sorting, treatment and evacuation of casualties and the provision of resuscitative procedures where appropriate. Level two is provided in a minimal care facility. This facility may include basic laboratory, pharmacy and temporary holding facilities. At this level, medical examinations and observations can be conducted in a more deliberate manner than at level one. The focus is on sustaining care and resuscitation, stabilisation and evacuation (Paramedic/ambulance)

- a. **Level Three.** Hospitalisation is provided for medium and high intensity nursing of wounded, sick and injured. Facilities are staffed and equipped to provide resuscitation, surgery and post-operative treatment. Care at this level may be the initial step towards restoration of functional health, as distinct from procedures that stabilise a condition or prolong life. Treatment is provided with greater preparation and deliberation. Level three medical units are able to prepare for evacuation of those patients who require care beyond the scope and management of the unit.
- b. **Level Four.** Specialist surgery, rehabilitation and hospitalisation are provided within the limits of the holding policy. It is normally the highest level of care provided in an area of operations.
- c. **Level Five.** The highest level of care which is normally provided only in the support area. It includes specialist and sophisticated management and care associated with the most advanced range of medical capabilities. Research facilities are also provided.

9. The military experiences of the 50's and 60's led to the development of Emergency Medical Systems and the forming of the Triage and Evacuation protocols used today in the military. Examples of these are:

- a. Triage groups:
 - 1. T1 (immediate), eg respiratory obstruction, accessible haemorrhage and emergency amputation,
 - 1. T2 (delayed), eg large muscle wounds, major fractures, intra-abdominal, thoracic, head or spinal injuries, and uncomplicated major burns,
 - 3. T3 (minimal), eg minor lacerations, abrasions, fractures of small bones and minor burns, and
 - 3. T4 (expectant), eg severe multiple injuries, severe head or spinal injuries, large doses of radiation and widespread severe burns.

- b. Evacuation priorities,
 - 1. P1,
 - 2. P2 and
 - 1. P3 (see attached).

During the 90's, military operational experiences have mainly been of a peacekeeping nature. Management of the traumas encountered on these peacekeeping missions is what has made the difference in the outcomes we see today. The Australian Defence Force is largely made up of fit, healthy personnel, who train regularly in preparation for war. However, no training during peacetime ever prepares the individuals for the traumas seen as a result of conflict such as witnessed in Rwanda and recently following the tsunami in Papua New Guinea. These deployments highlighted areas in the ADF management of trauma that need development. The two main areas identified were those of Training and Psychological support. As I was deployed to Rwanda I have concentrated on the effects of that conflict on the ADF.

11. On April 6 1994 the plane in which the Hutu and Burundi Presidents were travelling, was shot down by anti-aircraft fire over the capital city, Kigali. Both presidents were killed. As a result of this action, ethnic and intertribal violence escalated, genocide and slaughter occurred. Over 500,000 to one million people were estimated to have lost their lives as result of this Civil War. Like so many people around the world, Australians were distressed by what they saw, and responded to this disaster by agreeing to send a medical team to Rwanda

12. The Medical Company was made up of 93 Individuals from 29 different medical units from the three services (Army, Navy, and Airforce). The Australian Medical Support Force (AS MSF) provided levels One, Two and Three medical support (as described earlier), to UNAMIR and humanitarian support to the people of Rwanda. The Central Hospital Kigali was staffed by ADF personnel consisting of military doctors, nurses, physiotherapists, pharmacist and other health professionals.

Reservist surgeons and medical specialists came to Africa on six-week rotations. The system allowed for high level surgery, with all staff exposed to a range of trauma rarely seen or encountered in our peace time military system. Trauma such as:

- a. gunshot and machete wounds,
- b. mine injuries
- c. tropical diseases
- d. traumatic amputations of limbs,
- e. motor vehicle accidents resulting in fractured tibias and fibulas and
- f. infectious patients were just a part of the everyday experiences.

All of these conditions were exacerbated by the presence of HIV and AIDS related infection. Illnesses such as tuberculosis and malaria were also prevalent. Other care provided was Intensive care (ICU), pathology services and x-ray services. For quite some time, until the Non-Government Organisation side of Central Hospital Kigali had set up their x-ray department, Central Hospital Kigali was the only x-ray department in Rwanda. The ward had a holding policy initially of three days. However, this changed not long after our arrival, when the holding increased to twenty-eight days.

TRAINING

13. Each arm of military Service has a different ethos and reason for existence. The environment has a major affect on the roles and functions performed. For example, 1 Field Hospital deploys as a ground force as part of their training requirement. The Air Force, provide air support in the form of Aeromedical Evacuation (AME) from a site of injury to a Field Hospital. The Navy with their ships at sea, where there is no Nursing Officer or Medical Officer, must rely on the Medics' training and their ability to be able to diagnose and treat common illnesses as well as trauma.

14. The ADF Health Service is now tri-Service, in that most positions are rotatable between the three Services. The ADF is also becoming tri-Service in its training. Tri-

Service training is when all three Services are trained using the same curriculum, either together in one place or separately in different establishments. The instructor may be from any Service. This will standardise training across the board. Courses that are single service managed such as AME (RAAF), Underwater Medicine (RAN) and the FNC (ARMY), are also being opened to the other Services.

15. To be consistent, the ADF must provide the environment in which these people can practice their skills and obtain continuing experiences as well as maintaining their currency. This is being achieved by having in place strategic alliances with civilian hospitals and with the ambulance services.

16. Last year I was posted as an International Student to Fort Sam Houston, Texas USA, for six months to undertake a suite of courses. The United States is in the forefront of technology and is advanced in the treatment of trauma victims. The Brooke Army Medical Centre has the largest trauma facility in the United States and receives casualties from all theatres of war in which the USA have currently deployed troops. Two of the courses I attended offered clinical laboratories. These were the Battle Field Nursing Course and the Combat Casualty Care Course (C4). The first phase of the C4 was Advanced Trauma Life Support, Early Management of Severe Trauma, and Trauma Nurse Core Course (ATLS/EMST/TNCC). The students were expected to undertake the complete course, sit the examination and participate in their individual professional capacity. These courses were of great benefit to me, however, it would have been of greater benefit if I had been given this opportunity prior to deploying to Rwanda.

17. For all deployments Medical Officers, Nursing Officers and Medical Assistants, must have the appropriate training. The Medical Officer must be Emergency Management of Severe Trauma (EMST) qualified. The Nursing Officer must have completed the Field Nursing Course (FNC) and/or Acute Trauma Nursing Management (ATNM). Medical Assistants must have the Advanced Life Support Skills (ALSS). The role of the Medical Assistant, ranges from Enrolled Nurse in a hospital setting, to the provision of paramedical level pre hospital care.

18. Throughout the deployment, staff were exposed to a wide variety of trauma. Ongoing education was provided to all staff categories. Towards the end of the deployment, Nursing Officers were provided with a modified EMST course, which consisted of lectures and a live animal laboratory. These lectures covered

- a. Trauma Perspective,
- b. Primary and Secondary Survey,
- c. Four Skill Stations:
 - 1 - airway management,
 - 2 - circulation and haemorrhage,
 - 3 - neurological assessment,
 - 4 - head to toe assessment.

19. Procedures taught and practised during the live animal laboratory included:

- a. Intubation,
- b. Surgical Airway,
- c. Insertion of Intercostal Catheter,
- d. Cardiac Paracentesis,
- e. Diagnostic peritoneal lavage,
- f. Femoral tap, and
- g. Suturing.

20. Rwanda presented a unique opportunity to test the validity of training at all levels for a range of health care professionals. The ADF has a responsibility to aggressively improve all

training courses that prepare personnel for deployment. Further, arrangements must be made to ensure currency in skills that are learned during training courses.

PSYCHOLOGICAL TRAUMA

21. Throughout any deployment, there are many stressors that have to be dealt with on a daily basis. It has been well documented that degrees of stress can be beneficial to individuals. It can also be both frightening and exciting, and in short bouts it may even be stimulating. However, long term stress can have an adverse effect. In an endeavour to manage stress reactions within our staff in Rwanda, the following processes were put into place:

- a. team debriefing as soon as possible following resuscitation of a patient,
- b. encouraging staff to ventilate their feelings,
- c. assisting staff to identify what caused them stress,
- d. providing support to each other,
- e. provision of food and shelter,
- f. reinforcing the value of the work and the huge contribution each was making to these sad, frightened and damaged people,
- g. allocation of specific and necessary work they were doing, and
- h. identifying feelings of isolation, loneliness and missing family and home.

Just how effective was this approach? Each and every person who was involved with the operation, had their own opinion on its effectiveness.

22. As a result of the experiences of the first rotation to Rwanda, a team of two Psychologists were deployed two weeks prior to our departure home. This was the extent of our debriefing. For all that was seen and done in our six months, the support offered was found to be inadequate. * A Critical Incident Stress Management Team should have been deployed with the first rotation.

23. Critical Incident Stress Management, is a program that actively promotes a wide range of strategies designed to prevent stress, and mitigate traumatic stress reactions following serious accidents or incidents. Crises and traumatic events, which have a stressful impact, sufficient enough to overwhelm the usually effective coping skills of either individual, or a group, are known as critical incidents.

MAJOR ELEMENTS OF CRITICAL INCIDENT STRESS MANAGEMENT

24. The major elements of CISM program are:

- a. The development of an awareness of critical incident stress,
- b. Pre-incident education, and development of a preventive orientation,
- c. The development and training of CISM teams,
- d. Ensuring medical and psychological assistance for individuals,
- e. The development of disaster preparedness and response programs,
- f. The development of a peer support system, and
- g. The development of spouse and significant other support programs.

25. The ADF director for all aspects of CISM is a senior Psychologist, whose responsibilities are to:

- a. provide research material,
- b. revise operating procedures,
- c. develop, coordinate and conduct training courses and programs,
- d. revise the CISM operating guidelines,
- e. maintain all data and records relating to CISM including personnel trained for CISM, and
- f. collect statistical data after a CISM incident has occurred.

26. The functions of the CISM teams are to prepare Service personnel to manage their work related stress after exposure to a particularly stressful event. They also assist Service personnel who are experiencing the negative effects of stress after exposure to an unusually stressful event, by enabling them to work through their feelings.

27. The activation of the CISM teams occurs as soon as practicable after the incident. For incidents requiring debriefing, intervention should normally occur within 24 to 72 hours after the incident. An incident requiring defusing should normally occur within 12 hours of the incident. Incidents such as:
- a. death in both service and non service personnel,
 - b. multiple casualty incidents particularly where personnel have been exposed to gruesome sights, as seen in the previous slides, as an example
 - c. events where victims and/or relatives are known to staff,
 - d. situations which require prolonged involvement in incidents or activation with potential; danger to people,
 - e. staff responding to a high number of dangerous situations in a short space of time,
 - f. behaviour of personnel indicating obvious stress or unusual behaviour, including work errors with signals of distress continuing past three weeks,
 - g. prior to or on completion of overseas deployments which might involve critical incidents such as accidents or incidents in ships on deployment, work with UN peace keeping forces, natural disasters, and
 - h. a combination of the above.
28. It was recognised that a small percentage who returned from Rwanda were in fact suffering from Post Traumatic Stress Disorder (PTSD). Treatment was commenced accordingly. At the same time it was recognised that training of the treating physicians and psychologists in this very important area was required. The ADF, in partnership with the National Centre for War Related PTSD (Heidelberg, Victoria), designed a course for Psychologists and Medical Officers in Traumatic Stress Syndrome Training. This is run annually, and the aim of the course is to: Graduate health professionals with the knowledge and skills to care for patients who have suffered traumatic stress in the military environment. It is a 2 week residential course for students including medical officers, representatives from the Department of Veterans Affairs and the Vietnam Veterans Counselling Service. The aim

of the course is to provide those professionals with the knowledge and skills to care for personnel who have suffered stress in the military. The National Center has also assisted with the establishment of PTSD treatment programs for veterans in each state of Australia.

29. PTSD has been called a number of things ranging from shellshock, battle fatigue and accident neurosis. It has often been misunderstood or misdiagnosed even though this disorder has very specific symptoms that form a definitive psychological syndrome. By training our health personnel we can move quickly and effectively to identify problems being exhibited by personnel and be able to treat and refer appropriately.

CONCLUSION

30. Since Vietnam, the management of trauma in the military has changed considerably. In the wake of recent experiences in Rwanda and Papua-New Guinea, it is in my opinion, that the two areas where we were deficient, was in our training, and the lack of ongoing psychological support.

31. As a result of this, the ADF has incorporated the three services in a tri-Service training program, in an effort to standardise training across the board. An environment to achieve this, must however, be provided so that personnel may practice their skills to maintain their currency and proficiency.

32. It was also identified that a more supportive network needed to be provided to those personnel suffering as a result of psychological trauma. This has been achieved by the implementation of Critical Incident Stress Management, and a course for health professionals in Traumatic Stress Syndrome Training.

33. In conclusion, the lessons learnt were:

- a. The need for extensive Accident and Emergency/trauma training and perhaps more importantly the maintenance of the skills learned by detachments to civilian hospitals and ambulance services, and

- b. Training in stress management and in particular an introduction to personal stress reduction techniques should be provided early in a military career and refreshed frequently.