19809

PRIMARY CARE PROJECT

Progress Report

In compliance with Section 18 of the contract between the Joint Coal Board and the United Mine Workers (Northern Branch) please find enclosed our preliminary report and other such information as required under the contract agreement.

Our investigations to date have lead us to re-define our initial objectives and we now recommend that this project be expanded to the specific investigation of:-

Stage One

. initial treatment of injured mineworkers by other workmen.

Stage Two

. transport of injured mineworker from accident site to hospital.

Stage Three

. Investigating and reporting of accident and treatment of the accident victim under Section 86 of the Coal Mines Regulation Act 1982 as amended.

STAGE ONE

EFFICACY OF PRE-HOSPITAL TREATMENT OF SERIOUSLY ILL MINERS

INTERIM REPORT

PROJECT OBJECTIVES

To examine the methodology and adequacy of the treatment and transport of severely ill mineworkers in the immediate period after an accident and prior to the admittance to hospital.

The subject cohort will be the **last 12 fatalities that have occurred in the NSW Northern Mining District** complemented by a similar examination on the **12 last non fatal serious bodily injuries** as reported under the Coal Mines Regulation Act. Persons involved in this project to date are:-

* Team Leader, Dr O James, AM, MS, Fanzca.

* Mr R Land, Northern District Secretary, United Mineworkers.

* Mr J Tapp, Northern District Senior Check Inspector, United Mineworkers.

* Mr R Stothard, Northern District Check Inspector, United Mineworkers.

* Mr J Howson, Special Projects Officer, United Mineworkers, specifically employed to gather statistical and other evidence in respect of the subject matter.

* Ms Emily Benardos, Research Assistant/Stenographer, United Mineworkers.

STUDY COHORT PARTICULARS

12 NON-FATAL SERIOUS INJURIES

1	R Jeffery	Moonee	Fractured Ribs	07/08/92
2	J Pate	Wallarah	Fractured Arm	11/08/92
3	T Spicer	Teralba	Fractured Vertebrae	09/09/92
4	N Elliott	Lemington W/P	Broken Pelvis & Abrasions	02/10/92
5	F Fenton	Wallarah	Fractured Leg	29/10/92
6	R Hewitt	Newstan	Broken Ankle	05/11/92
7	M Frazer	Warkworth O/C	Fractured Ankles	07/12/92
8	J Schofield	Ellalong	Fractured Bone (Ankle)	19/12/92
9	A Hewston	Warkworth O/C	Broken Ribs	28/12/92
10	M Williams	Saxonvale	Head Injuries	27/04/93
11	J Dunshea	Mt Thorley	Head Injuries	05/05/93
12	D Brooks	Wambo	Multiple Injuries	21/05/93

12 FATALITIES

1	C Smith	Wallarah	Crush/Internal Injuries	22/05/89
2	C Watson	Liddell C/A	Head Injuries	12/12/89
3	P Geluk	Saxonvale	Burns	20/12/90
4	C Garaty	Cooranbong	Crush Injury/Chest	09/11/90
5	G Zeltins	Wallarah	Internal Injuries	09/08/90
6	K North	Wallarah	Crush	26/01/91
7	P Thorley	Howick	Crush	02/03/91
8	D Hall	Newstan	Crush	26/06/91
9	B Tillilzki	Gretley	Internal Injuries	14/11/91
10	M White	Cumnock	Crush	01/10/92
11	J Sabaclicci	Hunter Valley	Head Injuries	24/05/92
12	M Williams	Saxonvale	Head Injuries	27/04/93

IDENTIFICATION OF SUBJECT STUDY SEQUENCE

Within the framework of the cohort parameters listed above specific sequences have been identified to enable individual investigation to determine the

appropriate methodology required to form the best possible linkage of the different facets of the treatment/transport chain thus giving the injured mineworker the optimum chance of survival. These functions have been dissected into three main areas and are listed as follows:-

* Initial treatment of injured mineworkers by other workmen.

* Transport of injured mineworker from accident site to hospital.

* Reporting of accident and the treatment of the accident victim under Section 86 of the Coal Mines Regulation Act 1982 as amended.

Investigations to-date reveal an **uncoordinated mine site by mine** site approach to the subject matter allied with a **significant variance in the number and standard of mineworkers trained in first aid.** This is also the case, but not to the same degree, in the first aid officers at individual mine sites. Ie, one particular open cut mine has as its first aid officers ex-paramedics providing a 24 hour coverage of first aid whilst many other mines have a reasonably well trained first aid officer on day shift only with the back shifts being covered by persons with a basic level first aid certificate whose normal duties would also include a variety of pit top labouring functions.

The problem is exacerbated in the general workforce with large sections of the general body of employees having little or no first aid experience.

The accompanying statistics show the number and level of first aid trained persons currently employed in Northern District mines.

COLLIERY	No. EMPLOYED	No. OF FIRST AID CERTIFICATE	No. OF HIGHER QUALIFICATION	TYPE OF HIGHER QUALIFICATION	No. OF FIRST AID OFFICERS
Awaba	58	26 S J	2	Senior 1	2
Bayswater 2	206				
Bloomfield	93				
Camberwell	95				
Chain Valley	247	81 S J	65	Senior 62 Advanced 3 Medallion 16	6
Cooranbong	302	115 S J	40	Instructor 7 O/H Cert 4	4
Costain	435				
Cumnock 1	130	53 S J	3	O/H 3	5
Curlewis (Preston)	69				
Drayton O/C	552	34 S J			4
Ellalong	460	62 S J	2	O/H 1 Instructor 1	
Gunnedah	151				
Gretley	196	60 S J	2	Instructor O/H Cert 1	3
Hazeldene	358	64 S J			5

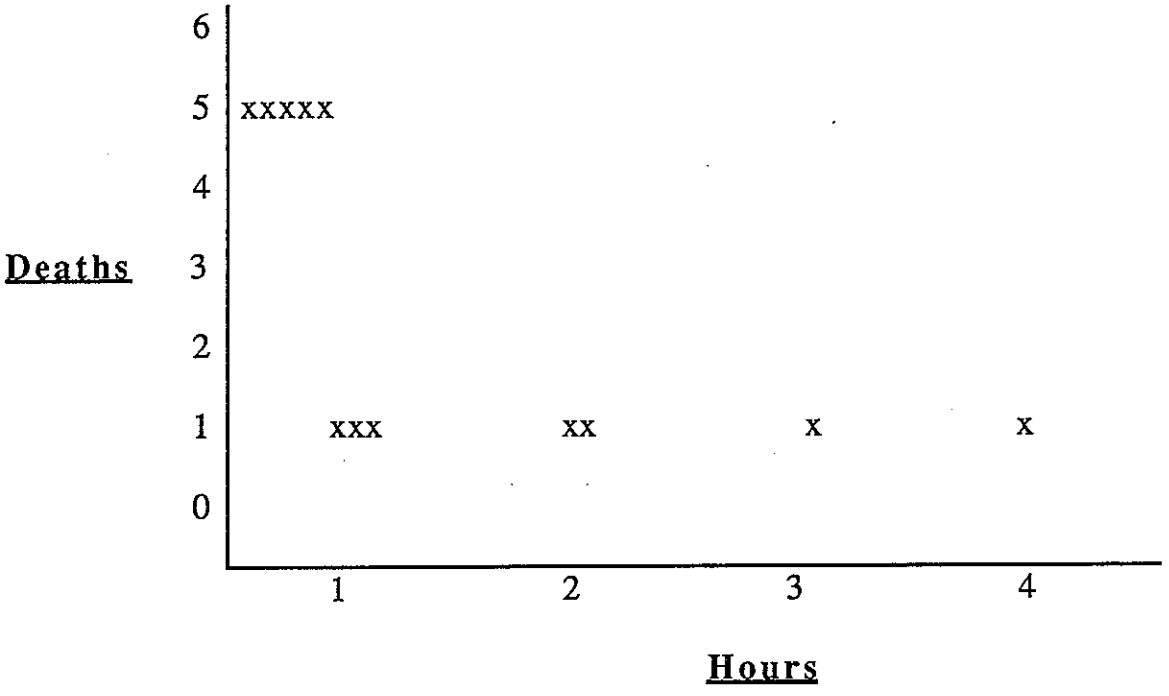
Howick	260		6		6
Hunter Valley 1	572				
Hunter Valley Prep Plant	140	21 S J	8	Medallion Instructor 1	1
Hunter Valley Mines Rescue	13	6 + S J		Basic Life Support 1	
Lemington O/C	240	75 S J	15		3
Lemington Prep Plant	66	32 S J	3	O/H Cert 1	1
Liddell	72	29 S J	14	O/H Medallion 5	4
Liddell Prep Plant	34	14 S J	7	Studying for Instructors Cert 1	1
Mt Thorley Prep Plant	29	9 S J			3
Mt Thorley O/C	665			O/H 100	
Munmorah	270	72 S J	4	All Medallion Cert	4
Muswellbrook	50	9 S J	10	All Senior Cert	1
Muswellbrook O/C	157	40 S J	1	Instructor	6
Myuna	313	95 S J	12	Medallion	4
Newcastle Mines Rescue Station					
Newdell P/Plant					
Newmain	48	21 S J			
Newstan	325	59 S J			2
Newvale 1	117	27 S J			3
Newvale 2	136	57 S J	9	Occ F/A 2 Medallion 6 Advanced 1	7
Rix's Creek	20	9 S J	9	All Senior Cert	1
Saxonvale	420	132 S J	6	Instructor 3 Rescue 25 O/H 5	
South Bulga	33	14 S J	2	Advanced 1	2
Teralba	312	81 S J	2	Instructor 2	4
Teralba Washery	74	27 S J			2
United	42	21 S J			3
Vickery	59	41 S J	4	Advanced 3 Instructor 1	4
Wallarah	67	81 S J	20	Medallion 4 Advanced 16	4
Wambo	252	120 Senior / Advanced		41 Occupational F/A	
Warkworth O/C	456	62 S J	6	Advanced	4
West Wallsend 2	291	65 S J	7	Senior	8
Wyee	296	80 S J	6	Instructor 1 O/H 2 Advanced 2 Army 1	

At particular disadvantage are the production crews in underground mines.

It is not uncommon to have only one person in the production crew with any formal first aid qualifications. In the event of serious accident the injured worker can only rely on this person and other untrained workmates to sustain life until the arrival of the colliery first aid attendant and then subsequent ambulance paramedics or doctors.

It is in this period, referred to as the "golden hour", that the highest percentage of deaths contained within the cohort study occurred. Set out below is a graph clearly depicting the time of death of the cohort study showing that 10 of the 12 fatalities were either instantaneous or deceased within two hours of the accident.

TIME OF DEATH AFTER INJURY IN 12 COHORT CASES



The point that is to be drawn here is that if the injured worker survives the accident the manner and application of first aid in the "golden hour" is critical to his chances of survival.

It can be said that having the highest trained personnel at the colliery ambulance room is of no assistance to an injured mineworker suffering from major crush injuries kilometres underground where every minute counts.

The persons who will largely determine whether he lives or dies are other mineworkers, many of whom with no basic training in resuscitation methods and stabilisation techniques.

DEVELOPMENT OF IMMEDIATE CARE FACILITIES FOR THE SEVERELY INJURED

The development of initial care of the severely injured had its major impetuous in war where the occurrence of severe injuries is concentrated in both time and place.

The experience in war shows a progressive improvement in outcome for those injured from World War I to the Vietnam conflict.

Although some improvement in outcome is related to improved surgical techniques the major improvement relates to the speed with which the seriously injured are brought to definitive care.

Included in the factors leading onto this improved outcome are the early **resuscitation and stabilisation** of the severely injured and **better methods of retrieval and transport.**

Using an **absolute** best case scenario it is contended that the minimum time to retrieve, stabilise, treat and transfer an injured miner from a local coal mine using air evacuation to John Hunter Hospital is 74 minutes.

SCHEDULE OF APPLICATION OF EMERGENCY FIRST AID AND RETRIEVAL OF INJURED MINEWORKERS

INJURY	TIME/SCHEDULE	
* Initial assessment/retrieval/resuscitation Relay / first aid room / assistance required	0-5	5
* Relay / ambulance / assistance required	5-6	1
* Ambulance activates paramedics / rescue helicopter Chopper launched with paramedics	6-18	12
* Paramedics landed / transferred to on site transport	18-26	8
# Flying time 5 minutes		
* Transport of paramedics to accident site	#26-35	9
+ Varies according to underground or open cut		

*	Stabilisation of patient Oxygen / intravenous fluids / preparation of patient for transport	35-60	25
*	Transport of patient to chopper	60-69	9
*	Flight time to level III trauma hospital	69-74	5
*	Patient delivered to John Hunter Casualty xxx	74	

xxx * Minimum time for retrieval of severely injured miner and transfer to John Hunter Hospital/Tamworth Base Hospital.

Outcome from severe injury depends on the presence or absence of immediately lethal injuries and if these are excluded outcome depends on the management of potentially lethal injuries and the avoidance of complications.

TIME OF DEATH AFTER INJURY

If deaths after injury are analysed they are found to occur in three main time spans, the "early", the "middle" and the "late". In motor vehicle injuries "early" deaths constitute approximately 40% and include those with immediately lethal injuries and those with airway obstruction and massive haemorrhage. Those deaths occur usually within an hour of injury.

The "middle" group include those who die of non-immediately fatal injuries such as cerebral injury and also include those who are unable to resuscitated sufficiently well in order to transported to a site of definitive care.

"Late" injuries are those occurring days to weeks after injury and usually relate to infection which itself may be brought on by immunological suppression or maybe introduced during the course of treatment. Secondary infection amongst severely injured mineworkers is not uncommon because of the locality of the injury site.

EARLY RESUSCITATION AND STABILISATION

Two main schools of thought and policy exist for the management of the severely injured. These are:-

* Immediate transport without stabilisation.

* Transport after stabilisation.

In parts of the United States notably San Fransisco the former pertains; in Australia, particularly the Eastern Coast and in the Newcastle area (where arguably the best transport and retrieval system for Australia has been

developed) the major principle is for transport following stabilisation to the trauma centre which in the case of the Hunter Valley is the John Hunter Hospital at Rankin Park.

Stabilisation includes a number of elements.

* Maintenance of oxygeneration.

* Analgesia.

* Intravenous resuscitation.

* Avoidance of hypothermia.

* Airway maintenance.

The above methods of treatment whilst desirable cannot be implemented unless all persons who may have occasion to apply these skills are trained to a level where they are both **confident** and **competent** to carry them out.

Locally based paramedics are dismissive of some of the more specialised techniques listed above (especially intravenous resuscitation) and much prefer that early efforts be made in the areas of basic resuscitation, life support and stabilisation of the accident victim until their arrival. The input of the paramedics is dealt with in greater detail later in the report.

DELAY IN TREATMENT AFTER MINE INJURY

Those injured in mines have not only the added difficulty of generally more severe injuries but also difficulty of access. This includes entrapment but also the time required to bring skilled personnel to the mine and from there to the coal face/accident site. Using best case analysis it has been demonstrated that the shortest time from accident to definitive treatment exceeds one hour. This best case exists for near Southern Newcastle mining sites. This time can be doubled if not tripled for the Northern mining sites of Singleton and Muswellbrook. Therefore treatment applied in the "golden hour" is critical. This is the hour after injury during which those without immediately lethal injuries can survive as a result of their physiological responses. Beyond this hour de-compensation occurs as a result of failure of the heart and lungs to be able to deliver sufficient blood to the injured tissues to maintain them in a viable state.

The characteristic blood system response to injury is the progressive loss of circulating blood volume and thus the mechanism by which oxygen and nutrients are moved to the tissues and carbon dioxide and waste products are removed.

The red cell component of the blood maybe diluted to one third of normal without loss of oxygen carrying function. It follows therefore that if the best

outcome is to be achieved a number of basic resuscitative and maintaining measures need to be available to the severely injured **and the persons most appropriate to apply this primary care are the accident witnesses.**

For example, some 10% of the injured who die have upper airway obstructor. There is need therefore for an injured person to have their airway maintained, by clearing if necessary. As well an injured person needs additional oxygen and pain relief.

When major internal or external haemorrhage occurs circulating blood volume needs to be maintained if necessary by intravenous infusions. This procedure presents a number of immediate difficulties if the mining industry became desirous of having personnel trained to a level where they could effectively discharge this process. The proposal that these personnel be given invasive technique training such as cannulation has many problems some of which are already becoming apparent in the NSW Ambulance Service.

The training of personnel in invasive procedures is long and expensive and continually requires skill maintenance ie; frequent use. If this is not carried out when the obvious happens: at a time of crisis the operation cannot function to an expected standard due to lack of exposure, or worst, continues to attempt advance procedures at the expense of basic life support. Paramedics are of the opinion that the utilisation of more basic equipment that can have the same or similar effects in the short term is more desirable ie; the application of the mast suit to splint fractures and auto transfuse blood volume. The use of the mast suit is still considered controversial in some areas but is in widespread use by the NSW Ambulance Service and is considered to be very effective.

RECOMMENDATIONS - Initial treatment of injured mineworkers by other workmen.

* **Recommendation 1**

Because of the unsatisfactory level of basic first aid skills in the general workforce:-

* implement an industry wide programme of basic life support training via colliery induction/retraining schedules using the JCB module as an Alnewcol guide.

* have implemented into the Alnewcol guide our own minimum standards and the introduction into section first aid kits of mast suits and the appropriate workplace training in the application of same.

Object of Recommendation 1

To provide every employee in the industry with the basic skills of resuscitation and life support.

To implement into NSW collieries mast suits as a obligatory component of section medical kits and train the workforce in effective use of same.

STAGE TWO

Transport of injured mineworker from accident site to hospital

Preliminary investigation reveals the same inconsistencies that are apparent in stage one because of the mine by mine approach to the subject matter. Areas currently under investigation are:-

. Emergency procedure at each mine specifically targeting;
  - internal activation - colliery
  - external activation - ambulance/R.H.S./J.H.H.

. Degree of exposure colliery workmen have to emergency procedures and at what regularity.

. Manner of transport of each cohort case to colliery dispatch point.

. Manner of transport of each cohort case from colliery dispatch point to hospital.

. Time taken to transport each cohort case from accident site to hospital.

. Identification of personnel and organisations involved in transporting each cohort case.

. Development of training modules to equip the workforce who may be required to assist helicopter crewmen and paramedics in "hot pick ups."

. Standardisation of rescue helicopter pads.

. Standardisation of identification of collieries and rescue helicopter pads from the air.

It is expected the this process will be completed by the 1st December, 1993 with the bulk of the investigative work being carried out by Mr. J. Howson and correlated by Mr. R. Land in conjunction with Mr. J. Tapp and Mr. R. Stothard.

The object of stage two is:-

. To measure the effectiveness of colliery emergency procedures in the time of workplace accidents.

. To measure the effectiveness of evacuation procedures used to convey the injured worker from the mine site to hospital.

. To identify the "chain" of procedures that are utilized in the treatment and transport of injured mineworkers to hospital.

STAGE THREE

Reporting of accident and the treatment of the accident victim under Section 86 of the Coal Mines Regulation Act 1982 as amended

"In June, 1991 the Coal Mining Inspectorate of the New South Wales Department of Mineral Resources adopted a methodology for accident investigation investigation known as System Safety Accident Investigation (SSAI). This has been employed since that time to form the basis for the investigation of fatalities and more serious accidents occurring in the coal mining industry in New South Wales.

SSAI consists of an accident investigation framework based on a number of "tools". These tools allow an investigation team to systematically examine: events and conditions related to an accident; management systems in place at the time of an accident; the transfer of damaging energy in the accident situation together with examination of in place or potential barriers to that energy flow; and certain behavioural aspects of those involved in an accident.

The team may also formulate a "Team Management Standard" which comprises steps the team recognises as desirable to plan, organise, direct and control operations similar to those in an accident situation. This "Standard" may be used to identify improvements desirable in the accident scenario and provide an audit tool for evaluation of other similar operations.

The structured nature of information arising from SSAI processes makes it a potentially very valuable tool for others in use in assessing operations which may be similar to those examined in an investigation. In order that some positive outcome may result from what are otherwise distressing incidents, the Coal Mining Inspectorate is distributing summaries resulting from SSAI's which it has conducted. This document has been prepared with that aim.

Those with a particular interest may obtain a full copy of the SSAI report on which this summary is based by contacting the team leader identified herein."

Bruce McKensey
Chief Inspector of Coal Mines
June, 1992.

The introduction of the System Safety Accident Investigation (SSAI) is to be applauded.

Until this innovation investigation of accidents were carried out within a general framework of precedents and legislative parameters but were

influenced by the particular needs or responsibilities of the participant investigators. i.e. Government Inspector, District Check Inspector, Coroner etc.

The SSAI to our knowledge, for the first time provides an analytical approach to serious accidents and fatalities that enables the industry to effectively modify operational procedures to help it best protect its workforce in order to prevent serious accidents and in the event of a serious accident how best to cope with it.

However, it would appear that that SSAI whilst taking detailed statements from accident witnesses in respect of the manner and timing of first aid does not deem it necessary to include the process in its reports or judgements.

The correction of this omission would, we believe, further enhance the SSAI as the definitive industry reporting procedure.

We are currently reviewing the practicalities of having the SSAI formalised by way of legislation and will have our investigations and recommendations completed by 1st December, 1993.

We are confident that the project will be concluded by 1st December, 1993. Additional funding is sought to complete the investigative procedures already commence with the deletion of the previous team leader Dr. O. James because of the essentially changed direction taken by the project team that no longer requires a medical practitioner as a key component of the investigative process.

The object of stage three is to present the N.S.W. Government the need to codify the SSAI procedure and give effect at law the judgements of SSAI investigations.

Funding

Initial funds advanced in relation to this project have been exhausted and immediate additional funding is requested to continue and complete the subject study. Allocation of the initial grant was as follows:-

Dr. O. James	$12 000.00
Mr. J. Howson	$6 300.00
Ms E. Benardos	$6 700.00

The remaining work will continue for the 17 weeks and will require ongoing funding for:-

.	Mr. R. Land	Nil
.	Mr. J. Tapp	Nil
.	Mr. R. Stothard	Nil
.	Mr. J. Howson	$15300.00
.	Ms. E. Benardos Research assist/stenographer	$7650.00

In connection with this project a meeting of industry/associated personnel will be held in Newcastle on the 5th August, 1993. Estimated cost of this seminar should the United Mineworkers have to pay the wages of each U.M.W. first aid officer who will attend will be an additional $13230.00. We would request that the Trust consider an additional payment to the UMW for costs incurred for the Seminar.

ATTACHMENTS

1. Draft Alnewcol on First Aid

2. UMW First Aid Minimum Standards

3. St Johns Ambulance Module

4. Mast Suit Procedure

MINUTE PAPER

9 November 1992

Mr Noel Pye
Manager
Occupational Health and Rehabilitation Services

DRAFT ALNEWCOL ON FIRST AID

Could you kindly submit this draft to the Board for their comments please.
Section 1.9 needs a Board directive.

Dr Hamilton Koelmeyer
Managing Occupational Physician

ALNEWCOL

TITLE: FIRST AID IN THE COAL MINING INDUSTRY

This alnewcol replaces Alnewcols Number 107 and 108
The aim of this alnewcol is to provide guidelines for the care of the injured worker and the standards of first aid in the Coal Mining Industry.

The emergency care of the sick and injured person has been the topic of study by a team of representatives from the Joint Coal Board's Occupatinal Health staff in consultation with St Johns Ambulance Service, Red Cross Society, Safety Council of NSW, the Mines Rescue Service, The Workcover Authority and the Helicopter service prior to drawing up this Alnewcol.

OBJECTIVES OF THE ALNEWCOL

1) To encourage Management, Worker, and Union commitment in ensuring that the coal mining industry provides quality emergency care of their sick and injured workers.

2) To encourage the development of a Colliery First Aid Policy to implement the above objective.

3) To provide guidelines for the industry on first aid in order to achieve uniformity in first aid care, training, and course content.

4) To provide simple documented guidelines for the first aider to follow.

5) To establish a minimum level of first aid skills for every worker in the coal mining industry.

6) To establish a system which will increase the standard of care in specific areas of trauma e.g. soft tissue injuries and major trauma.

NB A separate Alnewcol will be issued for impementing the use of methoxyflurane as an Inhalant Analgesic.

TOPICS COVERED IN THIS ALNEWCOL

1.1 Identification of WCA approved first aid corses

1.2 Identification of First Aid Structure for the Coal Mining Industry.

1.3. Outline of the Components of the INTRODUCTORY First Aid Module.

1.4. Outline of the Components of the MINING INDUSTRY FIRST AID MODULE.

1.5. Emergency response procedure flow chart

1.6. Outline of a First Aid Policy for the Collieries.

1.7. The role of the first aider in the mining industry.

1.8. Explanation of the links between the first aid levels and job responsbilities.

1.9. Outline the Joint Coal Board change regarding the first aid subsidy.

1.10. Outline of the procedure for follow-up contact with the JCB OHS in the event of psychological or Rehabilitation services being required.

1.11. Components of Refresher Course Training
a) Introductory level
b) Senior First Aid and Mining Module level
c) Occupational First Aid

1 12. Job Description of First Aid Room Officer

WorkCover Authority

The Occupational Health and Safety (First-Aid) Regulation 1989 makes employers responsible for providing first-aid facilities for employees at workplaces in New South Wales.

This leaflet lists organisations which provide first-aid and occupational first-aid courses approved by the WorkCover Authority.

The Regulation supplements the Occupational Health and Safety Act 1983 and sets the miniumum standards for providing first-aid at work.

The main areas covered by the first-aid regulation are . . .

- first-aid personnel
- the type and contents of first-aid kits and
- provision and contents of a first-aid room

First-aid personnel nominated to be in charge of a kit at a place of work where more than 25 people work must be the holder of a current approved first-aid certificate.

First-aid personnel nominated to be in charge of a first-aid room must be the holder of a current approved occupational first-aid certificate.

'Providing first-aid at work', a leaflet explaining the requirements of the First-Aid Regulation is available from your nearest WorkCover Authority office or by telephone (02) 287 6280.

For further information regarding the first-aid regulation, including advice on course approval procedures, call the WorkCover Authority on (02) 287 6249.

From January 1992 the new WorkCover telephone number will be (02) 370 5000.

PROVIDERS OF APPROVED OCCUPATIONAL FIRST-AID COURSES

(Suitable for personnel nominated to be in charge of a First-Aid Room)

AGENCY	ADDRESS	CONTACT	PHONE
St John Ambulance Australia (NSW)	6 Hunter Street Sydney 2000	Mr Mark Compton Training Manager	(02) 212 1088
Australian Red Cross Society	159 Clarence Street Sydney 2000	Mrs Chris Gowdie Training Manager	(02) 229 4111
Drake International	Level 14 – 1 York Street Sydney 2000	Ms Valerie Twyble	(02) 241 3960
New South Wales Ambulance Service	PO Box 105 Rozelle 2039	Mr M Shaw Regional Superintendent	(02) 818 0310

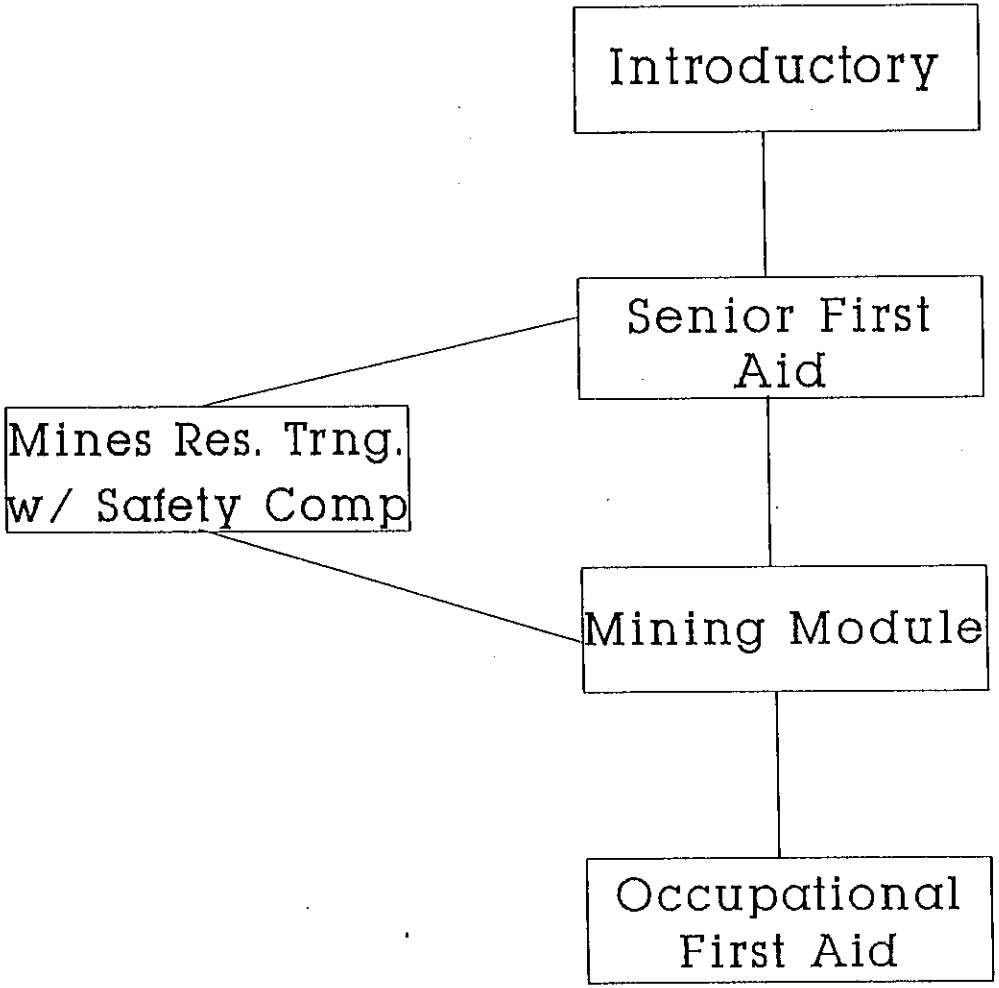
SUPPLIERS OF APPROVED FIRST-AID PAMPHLETS

(Each First-Aid Kit must contain an approved First-Aid Pamphlet)

St John Ambulance Australia (NSW)	6 Hunter Street Sydney 2000	Mr Mark Compton Training Manager	(02) 212 1088
Australian Red Cross Society	159 Clarence Street Sydney 2000	Mrs Chris Gowdie Training Manager	(02) 229 4111
State Rail Authority of NSW	Health Admin Sect 99 Macquarie Street Sydney 2000	Ms Narelle McNally	(02) 224 2222
Amada Pty Ltd	PO Box 193 Greenacre 2190	Mr Keith Gillies	(02) 642 0504
Safety Concepts Pty Ltd	PO Box 13 Marayong 2148	Mr Mitch Mitchell	(02) 831 5855
Trafalgar Trading Co Pty Ltd	PO Box 203 Revesby 2212	Mr W Parsons	(02) 771 6333
ICI Aust Botany Operations	16-20 Beauchamp Road Matraville 2036	Ms Margaret Roach	(02) 695 2455
ML International	PO Box 1136 North Sydney 2060	Mr Michael Lohmann	(02) 955 9708
Accidental First Aid Supplies	20 Stone Bridge Drive Glenbrook 2773	Mr Tony de Rooy	(047) 39 6448

JOINT COAL BOARD

Proposed Flow Chart for Development of 1st Responder (Team Member) First Aider



JOINT COAL BOARD

FIRST AID TRAINING MODULE

TOPIC: Introductory First Aid For Coal Miners:

AIM: To provide every mine employee with the basic concepts of first aid treatment and management of the injured person.

OBJECTIVES: By the end of this programme all participants will be able to;

1) Describe the basic concepts/principles of First Aid
2) Perform Casualty assessment
3) Describe the basic legislative requirements of a first aider
4) Explain when treatment is required, and demonstrate how to perform the following procedures; ABC, Haemorrhage, Shock, RICE and CPR.
5) Describe the methods used in preventing transmission of infection.

EXPECTED OUTCOMES:

Each participant will be able identify the casualties injuries and provide immediate first aid care.

MEASURABLE OUTCOMES:

Assessment in observation of skills;ABC, Casualty assessment, CPR

TRAINING NEEDS:

1. Training room
2. White board
3. Blankets
4. Manikins
5. Bandages
6. Ice packs
7. Gloves

DURATION:

4 hours total

MAXIMUM NUMBER OF PARTICPANTS:

12 - 14

OUTLINE OF PROGRAMME:

1. INTRODUCTION — Length: 10 minutes

   a) State the objectives of this programme.

2. TOPIC ONE: — Length: 20 minutes

   a) The basic principles of first aid

   b) The Legislative requirements of a first aid person

3. TOPIC TWO: — Length: 30 minutes

   a) Casualty Assessment
      - Primary
      - Secondary

4. TOPIC THREE: — Length: 15 minutes

   a) Communicable diseases
      - The first aiders role in prevention of cross infection

5. TOPIC FOUR:

   a) Specific subjects management, and practice.

CPR	(Theory)	Length: 15 minutes
	(Practical)	20 minutes
Bleeding control	(Theory)	Length: 15 minutes
	(Practical)	15 minutes
Shock management	(Theory)	Length: 15 minutes
	(Practical)	15 minutes
RICE Therapy	(Theory)	Length: 15 minutes
	(Practical)	15 minutes

6. TOPIC FIVE: — Length: 30 minutes

   Structured Practical of all course information
   Question and discussion time.

7. TOPIC SIX:

   Scenario assessments

WORKPLACE FIRST AID

FOR THE N.S.W. COAL MINING INDUSTRY

TOPIC: FIRST AID

AIM: To provide an understanding of minimum first-aid requirements in the workplace.

OBJECTIVES: At the end of the programme the participants will be able to:

1. Describe the role of the First Aider and the requirements for maintaining a First Aid Room.
2. Explain how to assess a casualty. — Is this Top to Toe assessment? ?
3. Describe how communicable diseases are transmitted and what protection methods are available.
4. Explain the management of:
   - i) Minor wounds
   - ii) Haemorrhage control
   - iii) Shock
   - iv) Amputated parts
   - v) Crush injuries
   - vi) Eye injuries
   - vii) Burns

   mast Suit application / Blood Pressure Reading
   Pulse Readings
   Head injuries
   Back / Spinal Injuries
5. Understand the importance of oxygen therapy and how to operate the Oxyviva.
6. Understand and apply the emergency action for DRABC and perform cardiopulmonary resuscitation.
7. Describe the use of Entonox and demonstrate effective administration of same.
8. Explain the importance of when to use RICE therapy and how to effectively manage fractures and spinal injuries.
9. Be able to safely transport a casualty via a blanket lift, Jordan frame and spinal board.

EXPECTED OUTCOMES

Each participant will be able to proficiently perform CPR, give oxygen therapy, use Entonox and safely manage the care of a casualty with shock, wounds and bleeding, burns, musculoskeletal injuries.

MEASURABLE OUTCOMES

Assessment of proficiency in CPR one person and two person method, oxygen therapy and Entonox.

TRAINING NEEDS

1. Training room
2. First Aid room
3. Overhead projector
4. White boards, pens.

EQUIPMENT NEEDS

1. Resusci Anne
2. Oxyviva
3. Entonox apparatus
4. Wound dressings, ice packs, splints
5. Jordan frame, spinal board.

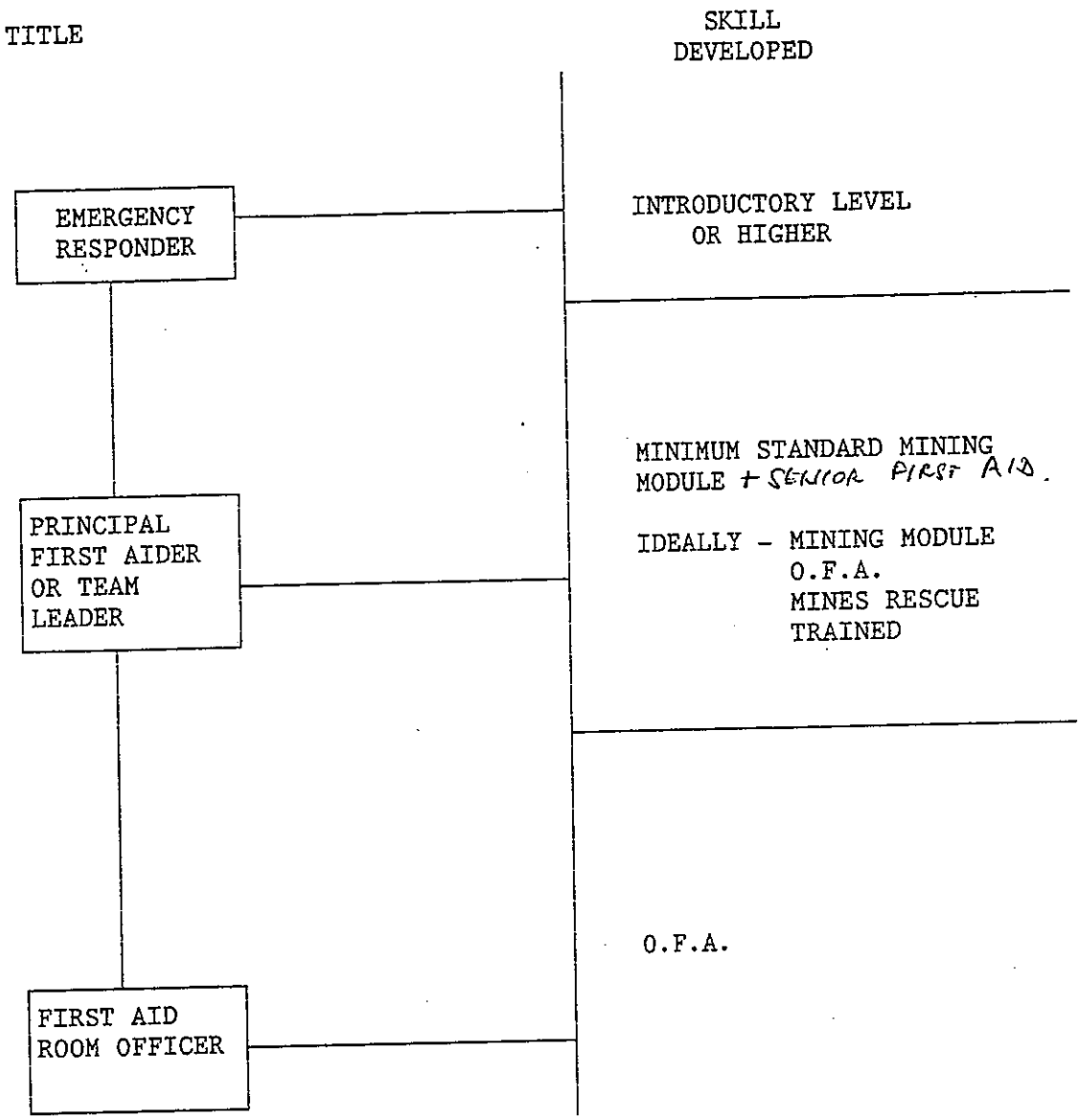
DURATION

2 Days

DESIGNED BY

Alison Butler

EMERGENCY RESPONSE PROCEDURE



1.6. Recommendations for a COLLIERY FIRST AID POLICY

Responsiblitiy for implementation rests on management with the JCB Occupational Health Division ensuring it meets required standards. First Aid Room Audits needs to be conducted by the JCB Occupational Health Staff.

The Colliery Policy should state;

a) The number of hours allocated for training upgrading, evaluation and maintenance of skills.

b) Comprehensive record keeping of above.

c) Identification badges for First Aid Responders and Principal First Aiders to be worn during a shift.

d) Each shift should have a leader who is a Principal First Aider in both opencut and underground mines.

e) First Aid Room ~~Attendents~~ OFFICERS should have same level of competence as a Principal First Aider. If already in this position should attain occupational first aider status wihtin 18 months. Job Description to be specified. Compulsory first aid for all at the time of filling in a "D" Form should be in the Policy Statement.

EXAMPLE

FIRST AID POLICY NSW COAL MINES

The Colliery is committed to providing a safe and healthy working environment for all its employees and visiting personel.

Part of this commitment is through the aims of first aid which is PREVENTION with the logical sequence of incident and casualty management.

Prevent the incident occuring
Prevent complications arising from the incident
Prevent the casualty dying
Prevent the casualty's condition becoming worse
Prevent any intervention being harmful

* First Aiders will show a caring attitude towards the casualty

* Learn and accept/his/her limitations

* Maintain and improve skills and knowledge

Colliery manager

THE ROLE OF THE TRAINED FIRST AIDERS SHOULD BE:

i To assess and evaluate casualties

ii To render prompt and efficient emergency medical care

iii Arrange safe and efficient transport

iv Arrange for the orderly transfer of patient care

v Communicate such with all parties concerned.

1.8 First Aid Levels and Job Responsibilities

Identified in 1.2

1.9 First Aid Subsidy by Joint Coal Board

1.10. PROCEDURE FOR FOLLOW-UP CONTACT WITH JCB OHS
a) Rehabilitation Services
b) Psychological/Trauma Counselling

a) REHABILITATION SERVICES
Contact the JCB Office within your district, the telephonist will then transfer you to the Rahabilitation Secretary, who will deal with your enquiries
Acute patients are generally seen witihin 24 :

b) PSYCHOLOGICAL/TRAUMA COUNSELLING
The JCB ~~does~~ operates its own Stress Debriefing team.
In the event of this service being required it is envisaged that the person of first contact will be the Managing Occupational physican in charge of the district office.

JOINT COAL BOARD
ALNEWCOL DRAFT

FIRST AID REFRESHER TRAINING COURSES:

TOPIC: REFRESHER COURSE FOR INTRODUCTORY FIRST AID MODULE:

Aim: To provide a short revisional course on basic first aid.

Objectives: By the end of the programme all particpants will be able to;

1) Describe the basic legislative requirements of a first aider.
2) Explain when treatment is required, and demonstrate the following procedures;
   ABC, Haemorrahge, Shock, RICE, and CPR
3) Describe the methods used in preventing transmission of infection.

Expected outcomes:

Each participant will have sufficient knowledge and skills to Clear and maintain an airway, Manage - Bleeding, Shock, Musculoskeletal injuries, and know the basics of how to perform CPR.

Measurable outcomes:

A short multichoice questionaire.
Scenario based Continuous assessment incorporating ABC,CPR,Bleeding Control,RICE, and Shock managements.

Training Needs:

1. Training Room
2. Overhead projector
3. White board and pens.

Equipment Needs:

1. Resuscitation mannikin
2. ICE packs
3. Roller bandages/Triangular bandages
4. Copies of OH & S First Aid regulations
5. Blankets/cushions

Duration: 3 hours

INTRODUCTORY REFRESHER COURSE

TIMETABLE

TOPIC:	TIME:
The first aider and the law/legislation	15 mins
The collapsed/Unconscious casualty (ABC's)	
- Theory	10 mins
- Practical	20 mins
Control of bleeding (Haemorrage and Shock)	
- Theory	10 mins
- Practical	20 mins
INTERVAL BREAK	**10 mins**
RICE Therapy	
- Theory	10 mins
- Practical	10 mins
Cardiopulmonary Resuscitation	
- theory	10 mins
- Demonstration	5 mins
- Practical	25 mins
Prevention of Communicable disease	10 mins
Scenario based Practical Assessments - Time allowed for completion of the scenario - 15 mins - This will be completed by students working in pairs, one will be the first aider the other will be the casualty. - Particpants must attain the level of satisfactory to pass the assessment.	25 mins

COURSE COMPLETED WITHIN 3 HOURS

JOINT COAL BOARD
ALNEWCOL DRAFT

TOPIC: REFRESHER TRAINING COURSE
SENIOR AND MINING LEVEL

AIM: To provide a particpants with an opportunity to revise their first aid knowledge and skills

OBJECTIVES: By the end of the programme all particpants will be able to;

1) Demonstrate their knowledge and skills of first aid at the introductory course level.
2) Explain the use of Oxyviva and demonstrate it's use on an unconscious casualty and in CPR.
3) Explain when and how to use the analgesic agents used in the coal mining industry.
4) Demonstrate correct casualty assessment and know that this technique is used to identify problems.

EXPECTED OUTCOMES:

Each participant will by the end of this course have sufficent knowledge and skills to work effectively as an emergency responder.

They will be able to manage a person requiring the following;

Airway management,	resuscitation,	musculoskeletal injuries,
bleeding	Shock	Pain relief
Oxygen	casualty assessment.	

They will also know how to protect themselves from and prevent the tranmission of infection.
They will also know how the law effects them as first aiders.

MEASURABLE OUTCOMES:

1) Multi choice paper based on course content
2) Scenario based assessments enabling demonstration of particpants skills on instructional material.

TRAINING NEEDS:

1. Training Room
2. Overhead projector
3. White board and pens.

EQUIPMENT NEEDS:

1. Resuscitation mannikin
2. Ice Packs
3. Roller bandages
   Triangular bandages
4. Copies of of OH&S Act
5. Blankets/cushions
6. Analgesic agents
7. Oxyviva
8. Dressing packs/Disposable bags water ampules/antiseptic amps

DURATION: 6 hours

SENIOR AND MINING LEVEL REFERSHER COURSE

TIMETABLE

TOPIC:		TIME:
INTRODUCTION		5 mins
The first aider and the law		10 mins
The first aider and communicable disease		10 mins
ABC	- Theory	10 mins
	- Practical	10 mins
CPR	- Demonstration	5 mins
	- Practical	20 mins
Oxyviva	- Theory	10 mins
	- Practical	20 mins
INTERVAL BREAK		15 mins
Casualty assessment		
	- Theory/Demonstration	10 mins
	- Practical	15 mins
Aseptic dressing technique		
	- Theory/Demonstration	10 mins
	- Practical	30 mins
INTERVAL BREAK		10 mins
Control of bleeding		
	- Theory	10 mins
	- Practical	15 mins
Management of Shock, Musculoskeletal injuries		
	- Theory	10 mins
	- Practical	20 mins
Use of analgesic agents		
	- theory	10 mins
	- Practical	15 mins
INTERVAL BREAK		15 mins
Free Practical (Students revise any topic)		35 mins
ASSESSMENTS		
1) Multichoice paper 2) Scenario based practical Participants work in pairs Time allowed for completion of practical 15 mins		40 mins
COURSE COMPLETED 6 hours duration		

JOINT COAL BOARD
ALNEWCOL DRAFT

FIRST AID REFRESHER TRAINING COURSE:

TOPIC: OCCUPATIONAL FIRST AID

AIM: To provide particpants an opportunity to; Revise, Occupational first aid skills, update their knowledge and develop their ability to pass information on.

OBJECTIVES: By the end of this programme all particpants will be able to;
(a) Effectively demonstrate; Resuscitation with and without the use of oxygen.
(b) Perform correct treatment of the injured casaulty within the boundaries of St John Ambulance Occupational First Aid Course.
(c) State how legislation relates the the OFAer.
(d) Outline procedures taken in the prevention of transmision of infection.
(e) Correctly demonstrate the use of analgesia found on site.

EXPECTED OUT COMES:

Each particpant will have revised their skills and knowledge to allow them to effectively operate in their role as Occuaptional First Aiders.

MEASURABLE OUTCOMES:

Scenario based continuos assessment
(POSSIBLY) Each student will be required to work in pairs to deliver a five minute speech on a specific first aid topic.

TRAINING NEEDS:

1. Training room
2. Overhead projector
3. White board and pens.

EQUIPMENT NEEDS:

1. Resuscitation mannikin
2. Ice packs
3. Roller bandages
4. Copies of the Acts
5. Dressing packs
6. Blankets/cushions
7. Analgesic agents
8. Oxyviva

triangular badages

DURATION: 6 hours

OCCUPATIONAL FIRST AID TRAINING REFRESHER COURSE TIMETABLE:

TOPIC:	TIME:
INTRODUCTION	10 mins
The OFA and the law	10 mins
The OFA and the FA room (including communicable disease)	10 mins
Scenario based revision - Each particpant will particpate. a) A collapsed casualty, who requires Oxygen, Analgesia and later CPR with the use of the Oxyviva. 15 minutes per person b) Casualty with musculoskeletal injuries and uncontrolled bleeding. 10 mins	45 mins
INTERVAL BREAK	10 MINS
Revision of basic concepts; - ABC, CPR, Oxyviva use, Analgesia	20 mins
Particpant Lectures Topics:	
- Casualty assessment	10 mins
- Moving the casulaty	10 mins
- The first aid room	10 mins
- Common mining injuries	10 mins
- Eye, Hand or musculoskeletal injuries	10 mins 10 mins
INTERVAL BREAK	**10 MINS**
Casualty Assessment - Practical	15 mins
Moving and Lifting the casaulty - Practical	15 mins
Aseptic dressing technique - Demonstration - Practical	10 mins 30 mins
INTERVAL BREAK	**10 MINS**
Use of analgesia - Theory - Practical	10 mins 20 mins
Referral Systems - Injury - Rehabilitation - Pschological counselling	15 mins
ASSESSMENTS Scenario based casualty situations	45 mins

1 12. JOB DESCRIPTION OF THE FIRST AID ROOM OFFICER
(The folowing is offered as a guideline only the on site job description is formulated by on site management and personnel)

N.B. ST JOHN AMBULANCE AUSTRALIA
OCCUPATIONAL FIRST AID (Authorised text)

(1) "Occupational First Aiders must only function within the guidelines of their training, experience and job description and to the best of their ability."

(2) "The occupational First Aiders major role is the management of work-related injury and illness."

(3) "Occupational First Aid is the emergency management of ill and injury at work".

FIRST AID OFFICER (FIRST AID ROOM)
NSW COAL MINE

JOB DESCRIPTION

COMPANY:

TITILE OF POSITION: First Aid Room Officer
Principal First Aid Officer

LOCATION:

QUALIFICATIONS: Holder of an Occupational First Aid Certficate, or be either a Medical practioner or Registered Nurse. (OH&S Requirements)

DUTIES:

1) Emergency Management of injured or sick persons
The OFA must treat patients to the best of their ability.

2) Maintenacne of reports and records
The OFA must maintain the legislatory required documents and any others required by his employer

3) Redressing of minor injury

4) Recoginition and reporting of health hazards

5) Participation in safety programmes

6) Maintenance of first aid room and or first aid box.

ACCOUNTABLIITY:

FIRST AID SERVICE:

UNITED MINEWORKERS GUIDE-LINES FOR MINIMUM FIRST AID STANDARDS NSW COAL MINES

Each worker in the industry should be trained to the level to be able to:-

1st Stage/Level

1) a) Assess the casualty.

b) Top to toe assessment.

2) Self protection - transmitted diseases.

3) Ability to manage the following:-

a) Cardiovascular monitoring and resuscitation (DRABC).

b) Fractures and dislocations.

c) Haemorrhage control.

d) Shock - hypothermia management.

e) Crush injuries.

f) Back and spinal injuries.

g) Amputated parts.

h) Eye and burn injuries.

i) Head injuries.

2nd Stage/Level

4) Administration of oxygen.

5) Pain management (entenox, methoxyflurane).

6) Record pulse and blood pressure.

7) Mast suit application.

ST. JOHN AMBULANCE AUSTRALIA (N.S.W.)

PROPOSED SPECIAL MODULE FOR COAL MINERS IN NEW SOUTH WALES

DAY 1

§ Review of DRABC Action Plan (including basic CPR)

§ Review of bleeding and shock

§ Advanced resuscitation (includes assessment)

DAY 2

§ How the human body works

§ The First Aider at work

§ Communicable diseases

§ Clinical assessment (including review of head, chest and abdominal injuries)

§ Lifting and moving casualties

§ Toxic hazards

DAY 3

§ Inhaled analgesics

§ Scenario-based assessment

RESOURCES

- Australian First Aid Vol 1
- Australian First Aid Vol 2
- Workbooks for Advanced First Aid Vols 1 and 2

LIFE SUSTAINING PROCEDURES

COURSE BACKGROUND

This course provides instruction in the basics of 'Life Sustaining Procedures'. It does not substitue for a comprehensive First Aid course. There are no pre-requisites for attendance at this course. Students must be in the year of their 15th birthday or older. A certificate in 'Life Sustaining Procedures' is issued which is valid for three years.

AIMS OF THE COURSE

To impart the knowledge and skills deemed necessary for sustaining life to the ill or injured person until medical aid arrives.

COURSE CONTENT

- Introduction to First Aid
- The DRABC action plan
- Bleeding
- Shocks
- Head, neck and spinal injuries
- Communicable disease
- More about resuscitation
- Wounds
- Burns
- Poisoning

COURSE DURATION

Eight hours

TRAINING STRATEGIES

Predominantly learner centred and practical. These include, lectures, videos, demonstrations, group discussions, practical sessions.

STUDENT EVALUATTION

Progressive assessment of students' knowledge and skills is conducted throughout the course. Students are also required to demonstrate effective resuscitation techniques.

REFERENCE MATERIAL

Staying Alive: First Aid with St. John Ambulance Australia (W.A.). This is included in the course fee, except for TAFE Courses.

Aug 91
rg:ca210e

ST. JOHN AMBULANCE AUSTRALIA (N.S.W.)

LEVELS OF FIRST AID TRAINING FOR COAL MINERS

IN NEW SOUTH WALES

■ INTRODUCTORY FIRST AID

An awareness program, suitable for all miners to provide the basics in life sustaining techniques.

■ SENIOR FIRST AID

The core first aid course that not only provides comprehensive training in first aid, but also provides a platform from which to move to more advanced courses.

■ PROPOSED SPECIAL MODULE

This proposed module provides additional training in specific areas relevant to the mining environment. In addition, the course reviews the essential elements of Senior First Aid.

■ OCCUPATIONAL FIRST AID

This premium first aid course is designed for Principal First Aiders and those in charge of first aid rooms.

SENIOR FIRST AID COURSE

THREE DAY FORMAT

TIMETABLE

Time	Day One	Time	Day Two	Time	Day Three
0900	Roll, stores, housekeeping	0900	Revision	0900	Revision
0920	Introduction to First Aid	0915	Wounds Informal Assessment: ring pad	0935	Chest Injuries Informal Assessment: fractured ribs, flail chest, penetrating chest wound
0950	What a First Aider Uses Informal Assessment: peer review, Instructor observation and feedback, folding bandages, reef knot, St. John, arm, collar and cuff slings	0930	Burns	0945	Abdominal and Pelvic Injuries
		1000	Head, Neck, Spinal Injuries Informal Assessment: cervical collar	1005	Poisoning
1030	MORNING TEA	1030	MORNING TEA	1035	MORNING TEA
1045	Safety	1045	Limb injuries	1045	Care of the acutely ill
1105	Communicable Diseases	1145	Facial injuries	1140	Bites and Stings Informal Assessment: pressure immobilisation bandage
1120	DRABC Action Plan Informal Assessment: stable side positions, EAR, one person CPR			1210	Overexposure to Heat and Cold
1230	LUNCH	1215	LUNCH	1230	LUNCH
1315	DRABC Action Plan (continued)	1300	Limb Injuries Formal Assessment	1315	Traffic Accidents
1400	More about Resuscitation Informal Assessment: two person CPR, detailed assessment of casualty	1400	Resuscitation Formal Assessment: - stable, side position, EAR, one person CPR, two person CPR (waiting students may complete workbook)	1330	Final Assessments: Theory Paper Three Practical - Casualty Management
1445	AFTERNOON TEA	1500	AFTERNOON TEA	1500	AFTERNOON TEA
1500	Shock	1515	Resuscitation (continued)	1515	Reassessments: theory, resuscitation, casualty management
1520	Bleeding Formal Assessment: - control of bleeding, limb, hand, scalp	1615	Theory Paper Two		
1615	Theory Paper One				
1630	CLOSE	1630	CLOSE	1630	CLOSE

7 August 1991

ST. JOHN AMBULANCE AUSTRALIA (NSW)

OCCUPATIONAL FIRST AID CERTIFICATE COURSE TIMETABLE

	MONDAY		TUESDAY		WEDNESDAY		THURSDAY		FRIDA
0830	Introduction Roll call Course overview Housekeeping	0830	Revision Senior First Aid Practical	0830	Revision Adavanced First Aid - Practical	0830	Revision Medallion First Aid - Practical	0830	St. John Ambula Marketing
0900	Legislation	0900	Clinical Assessment (continued)	0900	Mechanical Resuscitators	0900	Musculo-Skeletal Injuries	0900	Triage Transport
						1030	Chest and Blast Injuries	1000	Delayed Evacuati
1000	MORNING TEA	1000	MORNING TEA	1030	MORNING TEA	1045	MORNING TEA	1030	MORNING
1015	Social Problems	1015	Safety	1045	Mechanical Resuscitators	1100	Chest and Blast Injuries (continued)	1045	Emergency Child
1100	First Aid Room	1115	Kinetic Lifting			1130	Abdominal Injury	1115	Revision - DRAI - Primary Assessi - Secondary Asses - History taking - Scenarios
1130	Communicable Diseases	1145	Chemical Hazards			1145	Severe Bleeding Amputated Part Shock	1145	Explanation of Ex - Expectations
1300	Wounds and Crush Injury							1200	Theory Examinati
1230	LUNCH	1215	LUNCH	1200	LUNCH	1230	LUNCH	1230	LUNCH
1300	Hand washing	1245	Eyes	1230	Oxygen 1. Therapy assessment skill sheets 30,23,26,31 2. Clinical assessment skill sheets 13-14,16	1300	5. Severe Bleeding, Amputated Part and Shock assessment skill sheets 2-44-15 6. Clinical Mechanical Resuscitators assessment skill sheets 25,1,31	1300	Final Practical Assessment
1315	No-touch dressing technique	1450	Medications						
1445	AFTERNOON TEA	1445	AFTERNOON TEA	1500	AFTERNOON TEA	1500	AFTERNOON TEA		
1500	Documentation	1500	Oxygen Therapy	1515	3. Eye assessment skill sheets 19-20 4. Hand washing, no-touch dressing technique skill sheets 12,17	1515	7. Musculo-Skeletal Injury assessment skill sheet 8		
1530	Clinical Assessment								
1630	CLOSE	1630	CLOSE	1630	CLOSE	1630	CLOSE	1630	CLOSE OF COU

CIRCULATION
M.A.S.T. SUIT

PROCEDURE 103.9

INDICATIONS:

1. Hypovolaemia if the "key signs" of severe shock are present especially if bleeding is below the diaphragm e.g.

   ❶ Intra abdominal.
   ❷ Pelvic.
   ❸ Lower limb.

   Can be used with any type of hypovolaemic shock including anaphylaxis, drug overdose and spinal shock.

2. Cardiac arrest due to hypovolaemia.

MECHANISMS OF ACTION:

1. The direct pressure of the garment stops both external and internal bleeding in the abdomen, pelvis and lower limbs by a "tamponade" effect.

2. The pressure on veins in the lower half of the body autotransfuses blood into the top half to supply vital organs. It also makes "veins appear" in the arms and neck thus facilitating intravenous cannulation in the shocked patient.

3. The pressure reduces the size of the total intravascular bed and thus "a less than normal" blood volume will suffice to perfuse vital organs. This produces an increased total peripheral resistance and increases blood pressure.

4. The suit splints fractures of the lower limbs and pelvis.

The degree of B.P. response is determined by the amount of pressure in the suit. It is imperative that compartmental pressure be measured and that all compartments are at the same pressure. If the leg compartment pressures fall below the abdominal compartment then the blood will pool in the lower limbs and aggravate the shock. All three compartmental pressures must be continuously monitored to detect leaks requiring reinflation.

METHOD OF APPLICATION:

1. Lay the patient face up on the garment or slide the garment under the patient.

2. Apply the left leg first, the right leg second and the abdomen last.

3. Open the valves on the left and right leg chambers first and pump up to 50mmHg. The legs must be inflated first so that blood is driven out of the limbs. If the abdomen is inflated first, blood would pool in the lower limbs.

4. Lastly, inflate the abdominal chamber to 50mmHg.

5. Observe vital signs - if the B.P. does not rise inflate the legs and then abdominal compartments to 100mmHg.

Approved by: Chairman Medical Advisory Committee
Date: 1st January 1992
AMBULANCE SERVICE of NEW SOUTH WALES, AMBULANCE PROCEDURE

REMOVAL OF THE M.A.S.T. SUIT:

The suit must not be removed until:-

❶ the patient is in hospital.
❷ has been resuscitated with plasma expanders.
❸ facilities for immediate operation are at hand.

The only exception to this is if the patient's clinical condition is made worse by application of the suit. The urge to deflate the garment to inspect wounds must be resisted at all costs as it will lead to sudden hypotension and renewed bleeding.
When the M.A.S.T. Suit is deflated, release only one compartment at a time starting with the abdominal, whilst carefully monitoring vital signs. If the patient's condition deteriorates, immediately reinflate the garment.

ADVERSE EFFECTS:

1. Increases bleeding above the diaphragm. However, if the patient is severely shocked, the autotransfusion effect and increase in peripheral resistance outweighs this disadvantage.

2. Aggravates heart failure and can cause pulmonary oedema.

3. Vomiting, urination, defecation.

4. Interferes with breathing especially if traumatic diaphragmatic hernia or tension pneumothorax is present.

5. Prevents examination of the traumatised area. However, X-rays can still be taken, the bladder catheterised and an E.C.G. performed.

6. Prolonged application > 2 hours at pressures > 40mmHg can cause ischaemia of the limbs leading to a compartment syndrome.

With the pregnant patient the abdominal section should not be inflated.