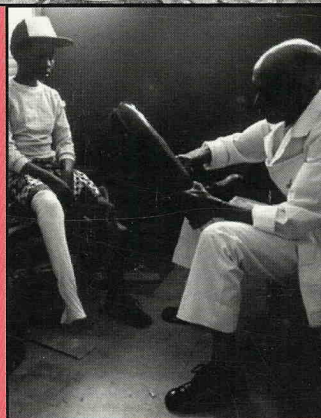
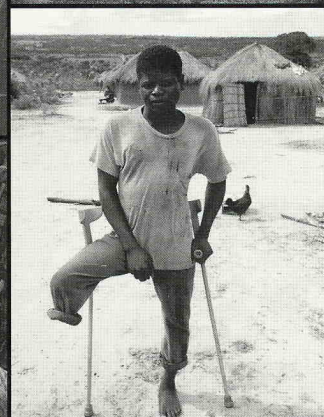
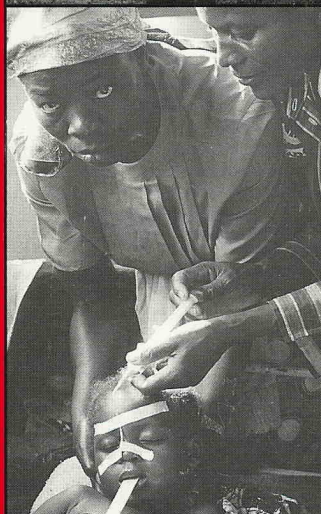
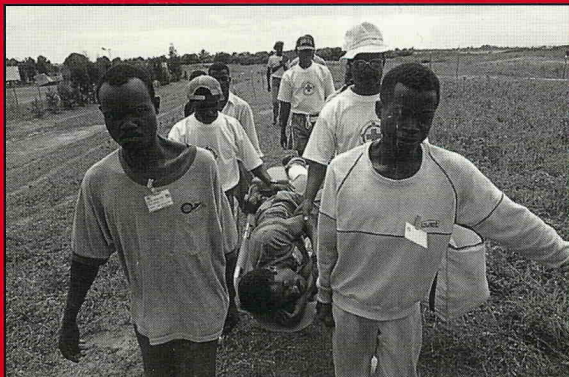


Primary Care of Landmine Injuries in Africa



**A Basic Text
for Health
Workers**



Produced by
International Physicians for the Prevention of Nuclear War



Contributing Editor: Ian Maddocks, MD

Editorial: Piji Protopsaltis, Lynn Martin, and John Loretz

Illustrations: Angelo Vlachoulis, Lori Messenger, and Gina VanderLoop

Design and Production: Lynn Martin

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Comments on this book are welcome and may also be sent to this address:

IPPNW
c/o Piji Protopsaltis
727 Massachusetts Avenue
Cambridge, MA 02139 USA
Telephone: 617-868-5050
Fax: 617-868-2560
E-mail: piji@ippnw.org
Website: www.ippnw.org

Contributors

Dr. Peter Bautz	Trauma Surgeon, Cape Town, South Africa
Dr. Anthony Gakwaya	Consultant Surgeon, Kampala, Uganda
Prof. Symon W. Guthua	Oro/Facio/Maxillary Surgeon, Nairobi, Kenya
Dr. Shadrack Lungu	Orthopedic Registrar, Lusaka, Zambia
Prof. Ian Maddocks	Physician, Adelaide, Australia
Dr. Costantine Malama	Surgery Intern, Lusaka, Zambia
Dr. Christina Maraspini	Orthopedic Surgeon, Cape Town, South Africa
Dr. Robert E. Mtonga	Surgical Resident, Lusaka, Zambia
Dr. Charles Murego	Orthopedic Surgeon, Kampala, Uganda
Dr. Johnson Murila	Orthopedic Surgeon, Kikuyu, Kenya
Dr. Eddie Mworozi	Consultant Paediatrician, Kampala, Uganda
Dr. Walter Odhiambo	Lecturer in Dentistry, Nairobi, Kenya
Dr. Martin D. Ogwang	General Surgeon, Gulu, Uganda
Dr. Francis Owor	Specialist Surgeon, Kampala, Uganda
Ms. Piji Protopsaltis	Landmine Campaign Coordinator, IPPNW, Boston, USA
Mr. Ken Rutherford	Landmine Survivors Network, Washington, USA
Mr. Paul Saoke	IPPNW Landmine Campaign Coordinator for Africa, Nairobi, Kenya
Dr. Paul Spray	Orthopedic Surgeon, Oak Ridge, USA
Dr. Adrian Von Der Borch	Orthopedic Surgeon, Adelaide, Australia



Participants at the Nyeri, Kenya, workshop (from left to right): Dr. Costantine Malama, Ms. Piji Protopsaltis, Ms. Jackline Ochieng, Dr. Shadrack Lungu, Mr. Ken Rutherford, Dr. Francis Owor, Ms. Rebecca Achieng, Dr. Anthony Gakwaya, Dr. Adrian Von Der Borch, Dr. Peter Bautz, Dr. Walter Odhiambo, Dr. Martin Ogwang, Dr. Charles Murego, Dr. Eddie Mworozi, Prof. Ian Maddocks, Dr. Christina Maraspini, Dr. Robert Mtonga, Dr. Peter Mwendwa

Contents

Introduction	5
1. Basic Information	6
Mine Types Used in Africa	6
Types of Injury	7
Mine Awareness	8
2. Care at the Place Where Injury Occurs	11
Emergency Medical Care	11
Managing Bleeding	14
3. Care at the Rural Clinic	16
Primary Survey (Assessment of the Injury and the Patient)	17
Secondary Survey	21
Reporting Primary Care	25
4. Care at the District Hospital	27
Primary Survey and Fluid Replacement	27
Emergency Surgery	32
Wound Care	32
Special Areas	38
Amputation	41
Management of Contra-lateral Limb	48
Fasciotomy	50
Antibiotics	52
Anaesthesia/Analgesia	53
Landmine Trauma in Pregnancy	57
Landmine Trauma in Children	58
5. Rehabilitation	60
General Information	60
Follow-up at the Rural Clinic and District Hospital	61
Prostheses and Their Maintenance	62
6. Psycho-social Issues Consequent on Landmine Injury	66
Social Aspects of Landmine Injury	66
The Experience of Suffering a Landmine Injury	67
Employment and Economic Integration	69
Reporting Consequences of Landmines to the Community and National Agencies	70
Campaign Against Landmines	70
Form to Report Primary Care	71

Introduction

Anti-personnel (AP) landmines, a pandemic of the second half of the 20th century, have caused mutilation and death on a global scale. Africa is the most heavily mined continent in the world today, with 18 of its nations plagued by 18-30 million anti-personnel landmines. No African countries are now listed as manufacturers or exporters of landmines (South Africa, Uganda, and Zimbabwe are reported to have ceased production). The rural populations of Africa are, however, among those most affected by the indiscriminate distribution of this weapon.

In the year up to March 1999, new use of AP mines was reported in Angola, Djibouti, Guinea-Bissau, Somalia, and Uganda. Though several of those countries have signed the treaty banning use, factional groups may continue to employ landmines.

A study of one province (Monica) in Mozambique estimated that there were 16.7 landmine injuries per 1,000 living persons. Of the injured, approximately 51% died as a result of the injury; of these deaths, 75% of deaths occurred before the victim reached a hospital.

Two-thirds of the victims were civilians; of these many were children or adults under 45 years of age. The effect on families of the loss of a spouse or a child is profound.

Effective first aid, rapid transport, and skilled primary care are vital to manage landmine injuries better. Africa does not have adequate medical resources and facilities or the professional knowledge and expertise of health care staff in the rural areas where landmines are most prevalent to provide the necessary care and support for the continent's many landmine victims.

This handbook has been prepared as a specific contribution to the management of sudden severe injuries caused by landmine explosions by increasing the understanding and confidence of those African health workers in rural areas. We hope that it may also contribute to general trauma management at the rural level. The text is based on discussions conducted by 19 African and international contributors who met for six days in Nyeri, Kenya, in November 1998. The meeting was sponsored by International Physicians for the Prevention of Nuclear War (IPPNW) and received generous assistance from The Royal Danish Ministry of Foreign Affairs (Danida).

Ian Maddocks
Coordinating Editor

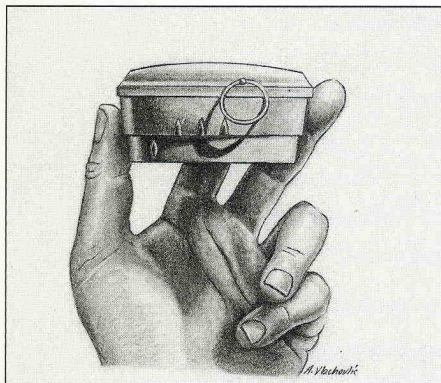


Figure 1. Type 72 anti-personnel mine (China) commonly used in Sudan, Angola, Somalia and triggered by pressure.

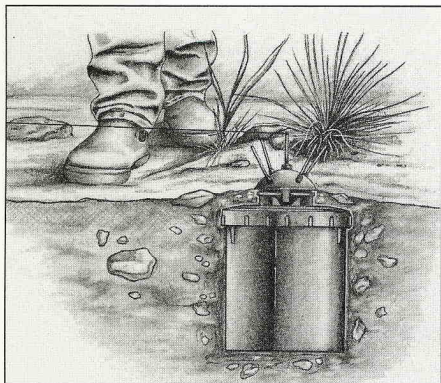


Figure 2. Valmara 69 anti-personnel trip-wire mine (Italy) commonly used in Angola, Somalia, and Mozambique.

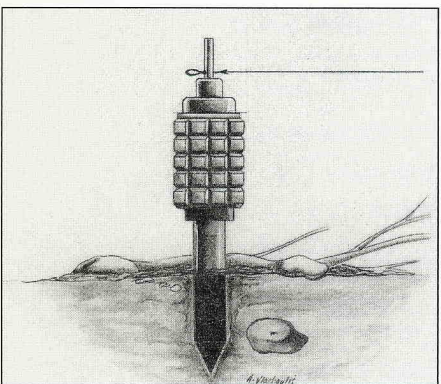


Figure 3. POMZ-2 fragmentation mine (Eastern Europe).

DEFINITION

A mine is a weapon made of a small packet of high explosives contained in a plastic or metal casing of various shapes, sizes, and colours. It is designed to be easily hidden in such a way that a person does not see it. Direct or indirect contact with the mine triggers the weapon's explosion and causes serious injury.

When used by soldiers against each other, or scattered to cause injury, a mine usually is hidden just under the surface of the soil or in vegetation beside a path where an attached trip-wire catches the leg of a passing person.

The mine is made to explode either by the pull on a trip-wire or by the pressure of the weight of a person or animal stepping on the soil surface above the mine. Most anti-personnel mines explode under a weight of about 5-10 kg. A small dog will usually be too light; a walking child, however, has sufficient weight.

The pull or pressure may make an electrical contact so that a small battery sets off the explosive charge, or it may bring two chemicals into contact to do the same. Most mines have metal in their casings or as part of the internal mechanism; some are made of plastic or ceramic and have so little metal that they are hard to detect with metal detectors. Most of the mines laid in Africa are detectable.

MINE TYPES

Mines are of two main types — blast mines and fragmentation mines — and their actions are illustrated in the diagram below.

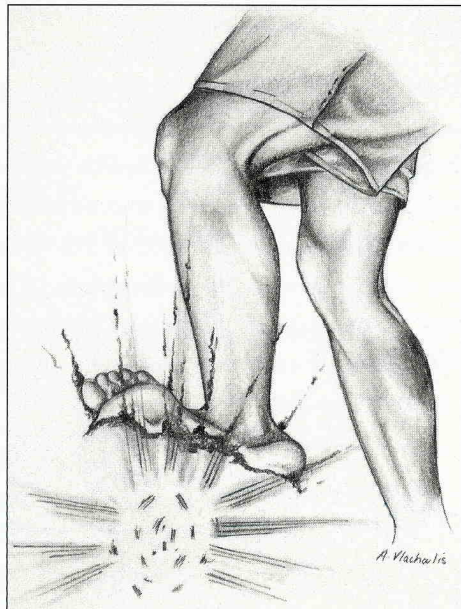


Figure 4. Action of blast mine.



Figure 5. Action of fragmentation mine.

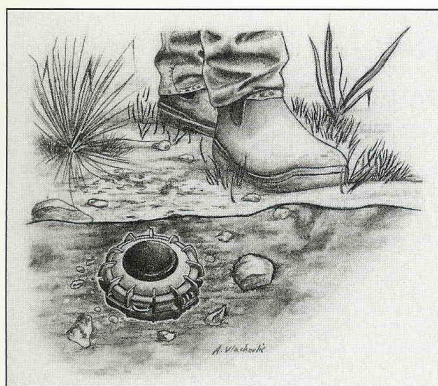


Figure 6. Blast mine Valsella VS-50 (Italy).

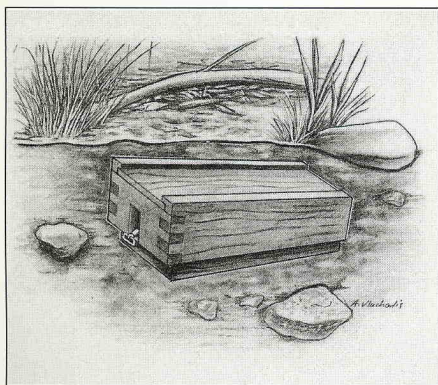


Figure 7. Blast mine PMD-6 (Soviet Union).

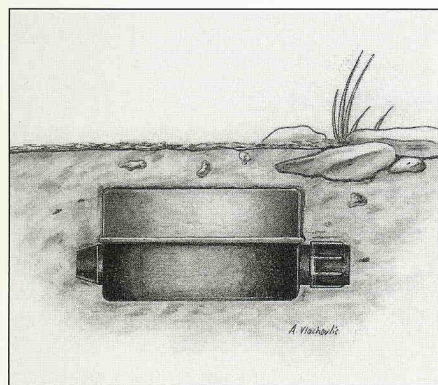


Figure 8. Blast mine PMN-2 (Soviet Union).

TYPES OF INJURY

Blast Mines

Two major mechanisms for the common injury caused by stepping on a blast mine have been identified:

- The effect of the shock wave which travels up the leg, and leads to fractures of bone;
- The effect of blast of released gases on soft tissue which strips flesh away from bone, destroys vascular and nerve attachments, and drives fragments from the soil and the mine casing deep into the flesh.

From the clinical point of view, three patterns of injury are recognized:

Pattern 1 Injuries are inflicted when a victim stands on a buried mine. The blast explosion most often injures the lower limbs. The injury usually causes loss of the foot or part of the leg which has stepped on the mine. Amputation may be required to save life. The blast may strip skin away from underlying muscle; and it may burst tissues where fluid and air are alongside each other within the body — the eardrums, the bowel, and within the lungs.

Pattern 3 Injuries result from picking up a blast mine which explodes in the air, causing severe upper limb, eye, and facial injuries.

Fragmentation Mines

Fragmentation mines usually cause **Pattern 2** injuries. They contain many small metal balls or fragments and the explosion drives them out for some distance, penetrating parts of the body not immediately close to the point of explosion. At first sight there may be little obvious injury apart from multiple small puncture wounds, but because metal and plastic fragments penetrate the body in many places — eyes, face, chest, or abdomen, and because they tear the internal tissues, there may be heavy internal bleeding and great risk of infection.

One study of 757 injuries found that more than one half were Pattern 2 injuries (multiple fragment wounds), more than one quarter were Pattern 1 injuries of the lower limbs, and Pattern 3 injuries were less than 10% (Coupland RM Korver A. BMJ 1991; 303:1509-1513)

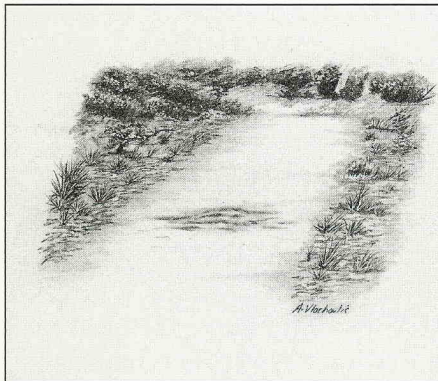


Figure 9a. Common signs that mines may be laid: disturbed soil.

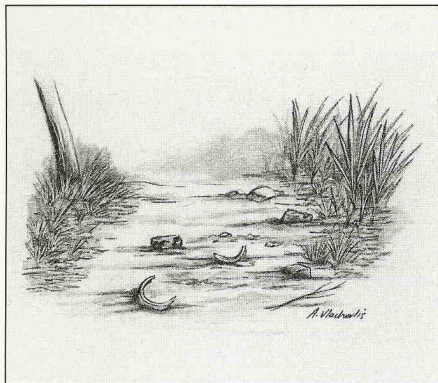


Figure 9b. Common signs that mines may be laid: fragments of shrapnel.

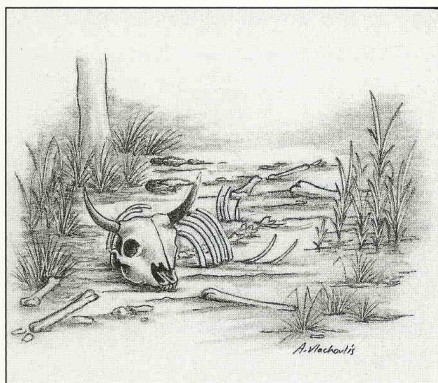


Figure 9c. Common signs that mines may be laid: dead animals.

MINE AWARENESS

Suspect Mines

The presence of mines should be suspected in areas of conflict, often near food gardens or water sources, along major roads, or along routes being used by soldiers.

Signs which indicate that a mine may have been laid:

- Freshly disturbed soil or grass;
- Suspicious or unfamiliar object;
- Areas where animals or people have been injured before;
- Areas where combat has occurred.

What to Do If You Suspect a Mine

Once aware of any suspicious object:

- Do not touch it;
- Warn others nearby;
- Mark the place in a recognizable way –crossed sticks, half-break a tree branch;
- Retrace your steps the way you came, treading in the footprints;
- Inform the community and report your suspicion to the authorities.

It is important to watch for unusual activity or suspicious persons. Encourage “Neighbourhood-watch” groups in local communities so that people report any strange person or activity.

Share knowledge about where mines may be laid

As part of mine awareness education and discussion in rural communities, emphasis should be given to sharing of knowledge and suspicion about where mines may be laid, what signs have been recognised which could indicate the presence of mines, what warning signs are understood (for example, crossed upright sticks).

Clearing mines is very dangerous

There needs to be an emphasis on the danger of trying to clear mines. A study of mines in 4 countries, including Mozambique, showed that 22% of victims were injured when endeavouring to remove mines.

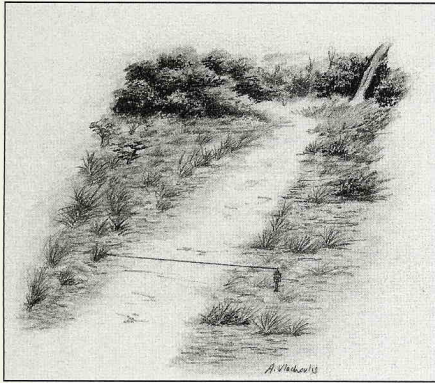


Figure 9d. Common signs that mines may be laid: a tripwire across a path.



Figure 9e. A common sign demarking a minefield outside of Maputo, Mozambique, which covers acres of once-usable farmland. It is now in the process of being demined. It is estimated that throughout Mozambique more than 2,000,000 mines are laid in fields such as this one.

Photo: Michael Christ, IPPNW

Everyone should know some first aid

In all mine areas there should be some training in simple first aid, with shared knowledge about what can be used for a pressure bandage and for a splint, and knowledge of the best persons to call for assistance in the immediate care of an injured person.

Transport

Thought should also be given to transport. What options are there in the community? Where can the nearest truck or tractor be obtained, the nearest cart in which a victim might lie? How much will it cost to obtain a suitable transport? How long will it take to obtain it? How long will it take to get to the nearest health centre or hospital?

TEACHING MINE AWARENESS

Most mines have been randomly laid — to no pattern. So they can be found anywhere — in fields, in urban areas, along rivers, in gardens, on paths and along transport routes. Local awareness of the location of mines is often quite poor. Regular community discussions about the threat of mines are very helpful. One person can be asked to teach mine awareness to families. This should be a respected person with good education — someone with position such as a school teacher, a minister, a politician, or a leader in a farmer's group or a women's group or a mine clearance group.

The local clinical officer or doctor is an appropriate resource for this education. He can gather key persons and encourage them to teach others, and can usually have access to appropriate literature, or possibly attend a mine education workshop.

What is to be taught? People must learn to recognize mines from diagrams that indicate size, appearance, and nature of common mines. Know why mines are laid and what determines where they are laid; what will activate them? Diagrams and pictures will be helpful. The injuries need to be illustrated graphically and, if possible, in colour! It is also important to discuss what to do when an individual is injured by a mine — getting that person back to a safe area, administering first aid, arranging transport to a centre where further care can be given.

The actual number of mines in a locality is less important than one would think. A community of 10,000 persons left their village in Mozambique because of mines, and after three months of careful demining work, only four mines were located. Four mines were enough to deny those people use of their land. The desirable number is none.

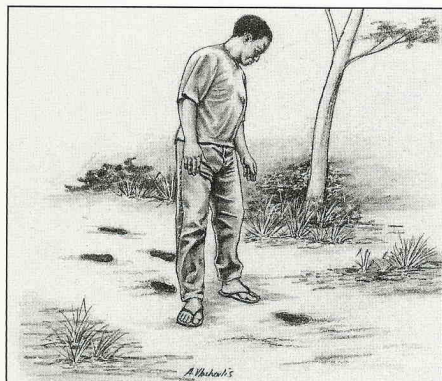


Figure 10a. Retracing steps back from where a mine is suspected.

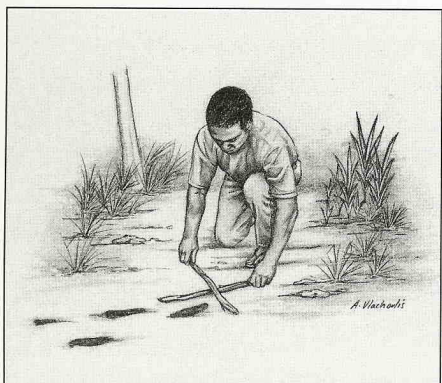


Figure 10b. Marking an area where a mine is suspected or known.

The wider effects of landmine injuries on the families of victims and on the communities of victims must also be recognized and discussed. Survivors are often unable to resume the roles they previously had as breadwinners and managers of the home. The community needs to help provide for such families, and this is an added burden on a community already badly affected by conflict. Some outside aid may become available, but usually the long-term survival and well being of affected victims, their families and their community will depend upon what can be achieved within the community itself.

Local communities can also assist in the reporting of information. Data are lacking and, without statistics and facts, priorities cannot be established, policy articulated, and programmes planned. The International Committee of the Red Cross has a mines information system as a tool for promoting synergy among the various political, military, and administrative authorities, non-governmental organisations. United Nations agencies, the International Committee of the Red Cross, and Red Crescent societies who are concerned with the global problem of landmines.

Reporting will allow authorities to determine such matters as:

- 1) Population density compared to density of mines laid;
- 2) Security concerns: who has laid mines; are mines still being laid;
- 3) The method used to lay mines;
- 4) How mined areas affect civilians: residential, agricultural, industrial;
- 5) What public or community activities are disrupted because of mines;
- 6) What transportation systems are affected: roads, bridges, tracks;
- 7) What is the indigenous mine-clearing capacity;
- 8) What the health system needs to deal with injuries and other health consequences.

Giannou C. Antipersonnel landmines: facts, fictions, and priorities. *British Medical Journal*, 1997; 315(7120): 1453-1454