Stability of Altered Forest Ecosystems (SAFE) Project

KALABAKAN CAMP

AND

MALIAU BASIN STUDIES CENTRE

CRITICAL INCIDENT & EMERGENCY RESPONSE MANUAL

Safety Systems

SAFE PROJECT - Kalabakan Camp and Maliau Basin Studies Centre

Critical Incident and Emergency Response Manual

Produced for the SAFE Project by www.fieldskills.com

The front sections of this manual guide you through dealing with an incident.

You are guided through the incident by the flow chart on the next page.

The back sections of the manual provide you with further reference material to help you deal with the incident.

INCIDENT MANAGEMENT

RECORD DETAILS OF THE INCIDENT
(Keep a log throughout of what happens)

SEND HELP?
Send a first aider or specialised search and rescue staff
Before they leave - ensure they have correct equipment

INFORM OTHERS?
INFORM - SAFE Project Senior Staff

DOES SOMEONE NEED EVACUATING?
Decide priority and arrange transport

WHAT IS THE INCIDENT?
For more advice with specific incidents...

- FIRST AID
- LOST PERSON
- FIRE
- FLOOD

LOST PERSON

FIRE

FLOOD + HEAVY RAIN

EVACUATION

FIRST AID

EMERGENCY NUMBERS

OTHER INFORMATION IN THIS FOLDER

DUTY MANAGER'S RESPONSIBILITIES.
This lists the day to day responsibilties
that the duty manager MUST do

DUTY MANAGER'S RESPONSIBILITIES

FIRST AID MANUAL
Full details from the First Aid course for reference.
Also details of the first aid kits and when they should be checked

FIRST AID KITS AND MANUAL

RISK ASSESSEMENT
Reminder of the prinicples of Risk Assessment

RISK ASSESSMENT

INCIDENT REPORT FORMS
To be filled in to record incidents

INCIDENT REPORT FORMS

LOST PERSON

RECORD DETAILS OF THE INCIDENT
(Keep a log throughout of what happens)

INFORM OTHERS

INFORM - SAFE Project Senior Staff

Start search - see next page
Full details on search procedure on next page

RECORD DETAILS OF THE INCIDENT

EMERGENCY NUMBERS

Other Considerations

Don't lose more people

Ensure search teams have check in times

Consider getting more help

INCIDENT REPORT FORMS

SEARCH AND RESCUE

SEARCH CO-ORDINATOR ROLE

It is the responsibility of the search coordinator to manage the search, make accurate records of events and actions and ensure that all the right people are communicated with.

COMMUNICATION

Ensure that the following people are informed of the situation-

SAFE Project Leader

Glen Reynolds (Director)

Police

Record all communications and times

Ensure that your communication equipment, (telephone, radio, sat-phone) is not occupied for too long while you are informing people, keep the lines free to communicate with the searchers and other rescue organisations.

SEARCH AND RESCUE

Once it is clear that a member of staff or visitor is missing or in difficulty in the forest you must start a search as a matter of urgency.

Duty Manager must co-ordinate the search from camp and assume the senior position.

Make arrangements for all staff to stop work and return to camp as soon as possible.

Gather as much information as possible:

WHO	-	is missing
		saw them last
		are they with
WHAT	-	has happened
		skills / training do they have
		equipment do they have
WHERE	-	were they last seen
		were they going
WHEN	-	did they leave
		were they due back

WRITE IT DOWN

Make a plan:

WHO	-	is available to search
		needs to be informed
		knows the missing person and can tell you how they might react
WHAT	-	equipment is available – stretcher, med kit, ropes, food
		will be done when the person is found
WHERE	-	should the search start
		should the search boundaries be
		will the searchers meet
		is the nearest helipad / vehicle for evacuation
WHEN	-	will the searchers communicate
		will outside help be called
		can the search begin
		will the searchers return

WRITE IT DOWN: Who is going to search what area? What time did they leave? When are they due to report back? Keep accurate records.

Initial searches usually start when there are only a few searchers available, these initial searches should confine themselves to trails and the location that the missing person was last seen, from this time on these trails and tracks should be continuously patrolled as well as nearby rivers and ridges.

- Always ensure that the searchers cover the ground slowly and thoroughly.
- Do not allow anyone to go out searching alone or without communication.
- Be prepared to call for help, call additional manpower early to give them time to prepare.
- Do not be tempted to leave the co-ordinators post unless it is absolutely necessary.

If the initial search is unsuccessful you will need to call Enforcement Camp / Plantation HQ / YS for help, ask them to send staff and search and equipment such as medical kits, rope, stretcher, torches, chainsaw, radios, satellite phones, compasses, whistles, food and water.

Try to utilise staff that know an area to search it

FIRE

RECORD DETAILS OF THE INCIDENT
(Keep a log throughout of what happens)

INFORM OTHERS

INFORM - SAFE Project Senior Staff
INFORM FIRE SERVICES

Are there any people injured

No | **Yes**

See first aid section. Remember avoid danger to others

FIRST AID

EMERGENCY NUMBERS

Who else is in the area?
Find out any other individuals or groups who are working in the area of the fire

Inform them
Evacuate them from the area
Ensure all groups and individuals are accounted for

Consider fuel stores in the area

RECORD DETAILS OF THE INCIDENT

INCIDENT REPORT FORMS

Other Considerations

Causes - any chance of recurrence

Remove equipment if safe

Beware of building collapse after fire is out

FIRE

If there is a fire in the camp you must raise the alarm by shouting, blowing whistles or banging a loud object.

Get everyone to safety before you fight the fire. Check that everyone is accounted for.

Do not re-enter the camp to collect belongings or valuables.

Turn off any electrical supply.

Find out if any fuel is stored in or around the camp, if so keep well back, fuel may explode.

Inform manager of the incident as soon as you have time.

If you are unable to fight the fire, call for assistance from the Enforcement Camp as soon as you can.

Once the fire is extinguished, take great care entering the camp as structures may collapse.

Monitor anyone who has been inside the camp whilst it was burning for breathing difficulties.

FLOOD + HEAVY RAIN

RECORD DETAILS OF THE INCIDENT
(Keep a log throughout of what happens)

SEE THE FLOOD DIRECTIVE DOCUMENT FOR FULL LIST OF ACTIONS

See next page...

INFORM OTHERS

INFORM - SAFE Project Senior Staff

Are there any people injured

No / **Yes**

See first aid section. Remember avoid danger to others

Who else is in the area?
Find out any other individuals or groups who are working in the area of the flood.

Inform them.
Evacuate them from the area.
Ensure all groups and individuals are accounted for.

RECORD DETAILS OF THE INCIDENT

Other Considerations

Close bridges

Get equipment to safety

Stop Forest work

FIRST AID

EMERGENCY NUMBERS

INCIDENT REPORT FORMS

FLOOD & HEAVY RAIN

The following guidelines are to be implemented as soon as the duty manager declares a flood:

- Carry out a daily inspection of all buildings, especially electrical installations.
- Beware of an increase in insects, invertebrates, snakes and rodents inside buildings as they will also be escaping the floodwater. Scorpions, centipedes, rats and tarantulas especially.
- Inform project leader of the flood situation and prepare for evacuation should the water enter buildings.
- Keep torches in readiness.

During times of prolonged heavy rain, the following guidelines are to be implemented:

- Leave one vehicle at the Enforcement Camp in case of impassable road conditions between the Enforcement Camp and the SAFE Project Camp.
- Take extra care when leaving the camp, always take a rope.
- Only cross rivers or streams if you have to and ensure you use a rope.

EVACUATION

MEDICAL EVACUATION

The decision to evacuate somebody for medical reasons from the Camp is to be made by the senior person on site and under advice from the most skilled, experienced and qualified medical person available.

Evacuation is considered as a result of an accident or incident such as:

**Snakebite, parang wound, treefall*
**Following a medical episode such as an epileptic fit*
**Illness or fever*
**Where somebody's mental condition is considered to be potentially unsafe*

In any situation where professional medical attention is considered necessary or when there is a possibility that a persons condition could worsen and threaten their life or long-term health and well-being.

In short it is advisable to evacuate any person whom you are at all concerned about, send them to a medical facility (hospital or clinic) for evaluation and tests. Many illnesses and injuries get worse overnight so evacuating before night is a good idea.

See next page for Priorities

SAFETY EVACUATION

This decision is also made by the duty manager, under the advice and guidance of the Director (if communications are available). In some instances the entire Camp may be evacuated and in other situations some staff may stay behind to secure the Camp.

Reasons for evacuation from the Camp may include the following:

**Large elephant incursion*
**Flood*
**Forest Fire*
**Storm*
**Terrorist threat*
**Armed hunters / loggers / criminals known to be in the area*
**Advice from a High Commission*

A safety evacuation must be planned and consider the following:

Can the evacuation be done safely?
Is everybody accounted for?
What is the destination and expected arrival time?
Is there support and facilities prepared to deal with the people being evacuated (food, water, clothing, washing facilities, transportation and communications)?
Is the Camp secure from wildlife and fire (electrical systems live or disconnected)?

DECISION-MAKING

In the case of a medical evacuation, the duty manager must always follow advice from medical staff when it says to evacuate. In cases where the duty manager is the senior medically trained staff advice can be taken by calling the hospital, a friendly doctor, the Director or Fieldskills. If there is any doubt – **evacuate as a precaution.**
Safety evacuations should only be initiated by the Director unless there is no communications available and the Duty Manager feels that an evacuation is necessary to secure the safety of visitors and staff.

MEDICAL EVACUATION PRIORITIES

* PRIORITY 1 *

Most urgent. Serious multiple injuries, head injuries, severe bleeding, snakebite, internal injuries, unconsciousness.

The casualty will need to be removed from the accident site to a road using a stretcher, be sure that the trails are clear and the team is strong enough. Send runners ahead to prepare boats and vehicles. MOVE QUICKLY BUT WITH CARE.

Helicopters
Signal to a helicopter that you need help by waving both hands over your head while standing on the helipad – if the helipad is on a road, ensure that you have people in place in both directions to stop vehicles. Once the pilot has seen you, move off the helipad.

The pilot will not need your directions to land, keep clear of the landing site as there will be a lot of dirt and dust blown around.

When the helicopter has landed wait until the pilot gives a signal to approach, you must always approach from the front and side of the heli and never from uphill or behind- the pilot will give instructions.

Load the casualty onto the stretcher with directions from the pilot and one person should accompany the casualty to hospital.

If a helicopter evacuation is not possible you will need to use a vehicle, ideally using a second vehicle as support and back-up. Drive quickly but carefully, keep headlights and hazard lights on.

Call ahead to the hospital to inform them of the casualty's imminent arrival.

Always be sure that the casualties' *notes and records* go with them to hospital as well as an *emergency contacts sheet and some money*.

* PRIORITY 2 *

Serious injuries that are not immediately life-threatening such as broken bones, cuts, high fever (39+ degrees).

Prepare an evacuation with some urgency but try to ensure the casulty's comfort as well by driving more carefully so as not to cause extra pain. Use headlights and hazard lights all the way to hospital. Call ahead to the hospital to inform them of the casualties' imminent arrival.

* PRIORITY 3 *

Situations where the casualty needs to be seen by a doctor but not urgently; this could include a low fever, a mild infection, a twisted ankle, tooth ache, etc.

FIRST AID INCIDENT

RECORD DETAILS OF THE INCIDENT
(Keep a log throughout of what happens)

SEND HELP?

Is there a first aider on the scene?

Yes | **No** — **Send first aider. Ensure they have suitable equipment**

INFORM OTHERS

SAFE Project Leader

Can the first aider deal with the situation

Yes | **No** — **Request medical help**

Deal with first aid

Look at specific first aid advice (after this sheet)

Consult first aid manual

Does the person need to be evacuated for further help?

No | **Yes**

ARRANGE EVACUATION

RECORD DETAILS OF THE INCIDENT

EVACUATION

EMERGENCY NUMBERS

FIRST AID KITS AND MANUAL

INCIDENT REPORT FORMS

EMERGENCY RESPONSE CONTACT NUMBERS: 1

EMERGENCY SERVICES

Ambulance:	**999**
Fire:	**994**
Police:	**999 (see next page for local contacts)**
Sabah Air (helicopter):	**088 484 733 / 088 484 326**

EMERGENCY RESPONSE COORDINATOR

SAFE Project Director	Dr Glen Reynolds	017 816 7177

SAFE PROJECT KALABAKAN CAMP SENIOR STAFF

Field Manager	Johnny Larenus	017 867 3841
Senior Research Assistant	Magat bin Japar	
Scientific Coordinator	Dr Ed Turner	012 833 8149 / (UK +44 77382 43676)
Satellite Phone		0087 07764 16932

ENFORCEMENT CAMP

PLANTATION HQ

MALIAU BASIN STUDIES CENTRE

Office		087 742 100
Manager	Jadda	019 851 5150
Satellite Phone		0087 07764 16981

YAYASAN CONTACT

	Dr Waidi Sinun	088 326 321

POLICE CONTACT

Kalabakan	Sergeant Major Terry	013 888 3305
Tawau		089 752 222
Nabawan		087 366 222
Keningau		087 332 222

FIELDSKILLS

Managing Director	Simon Amos	019 831 2579
Logistics & Admin Manager	Joe Wan	019 851 6615
Safety & Training Manager	James Burns	019 895 0704

ROYAL SOCIETY

SEARRP Admin Director	Irene Jintoni	019 852 8288
Science Policy Section	Ruth Cooper	(UK +44 207 839 5561)

WILDLIFE DEPARTMENT

SWD Assistant Director	Augustine Tuuga	088 213 502

EMERGENCY RESPONSE CONTACT NUMBERS: 2

FOREIGN EMBASSIES & HIGH COMMISSIONS

British High Commission, KL	
(General lines)	+60 (0)3 2170 2200 / 04
(High Commissioner)	+60 (0)3 2170 2224
(Robert New, Honorary Rep, KK)	+60 (0)88 251 775
	Fax +60 (0)88 237 214
American Embassy, KL	+60 (0)3 2168 5000
Costa Rican Embassy, Singapore	+65 6738 0566
Danish Embassy, KL	+60 (0)3 2032 2001
German Embassy, KL	+60 (0)3 2170 9666
New Zealand Embassy, KL	+60 (0)3 2078 2533

HOSPITALS

Tawau Hospital	+60 (0)89 773 533
Lahad Datu Hospital	+60 (0)89 895 111
Sandakan Hospital	+60 (0)89 212 111
Sabah Medical Centre (SMC)	+60 (0)88 211 333
Queen Elizabeth Hospital (QEH)	+60 (0)88 517 555

SABAH AIR DUTY LINES

Kota Kinabalu	+60 (0)88 316 044 / 484 326
Sandakan	+60 (0)88 667 505
Tawau	+60 (0)88 950 818 / 950 828
Marketing Manager Tova Waage	+60 (0)88 484 733
	+60 (0)17 818 0098

DUTY MANAGER'S RESPONSIBILITIES

- RECORD DAILY STAFF MOVEMENTS

It is necessary to know where staff are so that they can be searched for if they get lost or have a car accident.

- ENSURE FIRST AID TRAINED STAFF ARE ALWAYS AVAILABLE

There should always be a trained member of staff available who is aware that they are the duty first aider and are prepared to respond to illnesses or accidents.

- RECORD ALL INCIDENTS

Fill out an incident record form for all accidents and near-miss incidents where there was an incident and nobody was hurt or where an accident almost happened.

- MANAGE ALL INCIDENTS

Be responsible for ensuring that the casualty receives the right treatment, that they are evacuated if necessary and that the right people are informed.

- SUPERVISE SEARCH AND RESCUE OPERATIONS

Remain at base and establish a communications system, organise searchers and their equipment, make a record of everything that you do – see 'Search and Rescue' in the Critical Incident Manual.

- RECORD ANY USE OF THE MEDICAL KIT

If the first aid kits are used, a record must be kept of what was used and on who. It is especially important to record the use of the drugs and medications. If this record is not kept the duty manager will be expected to explain why not.

FOREST FIRST AID KIT

- Non-sterile gauze
- Sterile dressings (small and large)
- Bandage
- plasters
- Gloves
- Oral rehydration salts
- Zinc oxide tape
- Ibuprofen pain killers

Include an 'Epi Pen' if taking susceptible people or are likely to be far from help

⇒ **A** = **Assess** – ensure that the environment is safe to approach the casualty / **Approach** / **Alert** – is the casualty able to hear and respond to you calling them or touching them / **Assistance**

⇒ **B** = **Breathing** – is their airway clear can you feel / see them breathing? (head tilt, chin lift, look listen feel for up to 10 seconds)

⇒ **C** = **Circulation** – any major bleeding?

⇒ **D** = **Damage** – any broken bones, internal injuries (head to toe check)

⇒ **E** = **Ensure** (re-check breathing) and **Evacuate**

If resuscitation is necessary:
give 30 chest compressions and 2 breaths,
continue as long as you can. Call or send for help.

In case of burns, keep under running water until the pain is gone, apply burn dressing. Keep sterile.

Bleeding – apply pressure and raise the limb (if possible)

Head injuries are usually serious, evacuate.

Any loss of consciousness is an emergency, locate an advanced first aider to commence vital signs recording and you must initiate an evacuation.

ANAPHYLACTIC SHOCK

If a reaction to a bee sting or an insect bite is severe and the victim appears to be having difficulty breathing, administer the 'Epi pen'.

This is a life-saving action, follow the instructions on the unit and evacuate to hospital as fast as possible.

SNAKEBITE

Always evacuate snakebite victims as fast as possible

- Make sure the snake is gone
- Lie the victim down and calm them
- Expose the bite site and wash it
- Apply dressing and bandage firmly but not too tight
- Apply a splint to immobilise the limb
- Evacuate as an emergency on a stretcher, they must not walk

Keep monitoring the limb during the evacuation for swelling, it may be necessary to loosen the bandage a little.

If you use anything from this kit please ensure that it gets replaced

LABORATORY

EYE WASH AND

BASIC FIRST AID KIT

- 1 x Eye wash
- 2 x Sterile dressings
- 3 x Burn dressings
- 2 x Bandages
- 1 x Tape
- 2 pairs Gloves
- 10 x Plasters (band aids)

In case of burns, keep under running water until the pain is gone, apply burn dressing. Keep sterile.

Bleeding – apply pressure and raise the limb (if possible)

Chemical in eyes – flush out with eyewash and evacuate to hospital

If this kit is used at all please inform Duty Manager so it can be restocked

VEHICLE FIRST AID KIT

- Non-sterile gauze
- Sterile dressings (small and large)
- Bandage
- plasters
- Gloves
- Zinc oxide tape
- Ibuprofen pain killers

EMERGENCIES:

Prioritise casualties, (ABCDE) stop any bleeding with pressure to the wound.

Is there anyone else injured? Did anyone get thrown clear of the vehicle when it crashed?

If there is a risk of spine damage you must stabilise the spine and minimise movement of the casualty.

Pain killers (Ibuprofen) are for self-administration only, do not give to people with Asthma.

⇒ **A** = **Assess** – ensure that the environment is safe to approach the casualty / **Approach** / **Alert** – is the casualty able to hear and respond to you calling them or touching them / **Assistance**

⇒ **B** = **Breathing** – is their airway clear can you feel / see them breathing? (head tilt, chin lift, look listen feel for up to 10 seconds)

⇒ **C** = **Circulation** – any major bleeding?

⇒ **D** = **Damage** – any broken bones, internal injuries (head to toe check)

⇒ **E** = **Ensure** (re-check breathing) and **Evacuate**

If resuscitation is necessary;
give 30 chest compressions and 2 breaths, continue as long as you can.
Call or send for help.

- Drowning – clear the airway, lay flat and give 5 rescue breaths – start resuscitation if breathing does not start immediately

- In case of burns, keep under running water until the pain is gone, apply non-stick dressing. Keep sterile.

- Bleeding – apply pressure with clean dressing and raise the limb (if possible)

- Head injuries are usually serious, monitor level of consciousness, evacuate.

- Any loss of consciousness is an emergency, locate an advanced first aider to commence vital signs recording and you must initiate an evacuation.

Try to record as much information as you can, write down everything you see and do, this is important information.

<u>If you use anything from this kit please ensure that it gets replaced</u>

VITAL SIGNS

BLOOD PRESSURE

Record blood pressure when the casualty is sitting or lying down; ensure that the arm is not injured.
Wrap the cuff around the arm and place the stethoscope on the inside of the elbow.
Pump the cuff up to 150, hold it for a second then slowly release the air, listening for a 'thump' sound as the blood is forced through, that is the first figure, keep listening to the heartbeat as you slowly release the air, when the sound disappears, that is the second figure.

Normal Ranges – 110 – 150 / 60 – 90

PULSE

Feel for the pulse with your two forefingers on the inside of the wrist, just below the thumb. Press gently until you feel the pulse. Count how many beats in 30 seconds and double the number to get the Beats Per Minute reading.

Normal Range – 55 – 95 at rest

TEMPERATURE

Using a glass thermometer, place it in the patients mouth, beneath the tongue. Or put it into the armpit. Wait for three minutes, then read the results.

Normal – 37 degrees
Low – 36 degrees
High – 37.5 degrees
Very high – 38.5 degrees

This thermometer reads 37.8 degrees

Example recording :-

TIME	PULSE	BLOOD PRESSURE	TEMP	RESPS	NOTES
12.30	140	112 / 65	38.5	25	Joe has been extremely sick and is having diarrhoea and vomiting. I.V fluids started and Paracetamol given at 12.30
13.00	130	120 / 76	37.9	22	
13.30	90	125 / 75	37.5	20	

VITAL SIGNS RECORD SHEET

NAME -   DATE -

TIME	PULSE	BLOOD PRESSURE	TEMP	RESPS	NOTES (Glasgow coma scale)

WOUNDS AND BLEEDING

The basic rule is that you stop the bleeding, keep the wound clean and promote healing.

Some small wounds do not need hospital care, as long as infection can be prevented and the wound is healing.

1. STOPPING THE BLEEDING

Raise the injury above the level of the heart – this is only possible on injuries to the arms and lower legs.

Apply pressure – using clean (if possible) dressings, press on the wound until the blood stops flowing.
If the bleeding is persistent pack sterile gauze into the wound and re-bandage.
Splint the limb if possible to prevent movement.

2. PREVENTING INFECTION

Clean all wounds with an antiseptic solution.
Remove any foreign material, dirt etc.
Cover wound with a non-stick dressing & hold in place with bandage or tape.

3. PROMOTION OF HEALING

Cuts and lacerations should have the wound edges brought together, having checked that CSM are okay. Use steri strips (wound closures) or evacuate for suturing.

4. PRESERVATION OF FUNCTION

A healthy diet and rest will encourage faster healing as will gentle exercises to prevent joint stiffness.

IMPALEMENT

Do not remove the foreign object if at all possible, cut object and evacuate with it *in-situ*.
Pain relief will be needed.

FLAP WOUNDS

Clean under the flap then dress with the sterile dressing *underneath* the flap
If it is small, redress daily slowly putting less and less dressing in the wound, this allows it to heal from inside.

If it is large it may require skin grafts.

SCALP WOUNDS

These tend to bleed profusely, apply direct pressure and bring the wound edges together, cut away the hair and use steri strips (butterfly sutures).

FACIAL WOUNDS

Wounds on the face tend to heal quite quickly, beware of infections and the risk of scarring, often young girls should be evacuated for plastic surgeon opinion.

WOUND INFECTIONS

Any wound can become infected, signs of infection are;

Pain, Redness, Swelling, Heat, Limitation of movement

If untreated this can lead to;

- Pus leaking from wound or trapped under skin
- Red streaks as the infection makes its way up the lymphatic system

Eventually the infection will become *systemic*, this is characterised by;
Fever and tender lymph glands

When a wound infection is allowed to get to this stage the casualty will need Intravenous antibiotics at a hospital and there is a real risk of toxic shock.

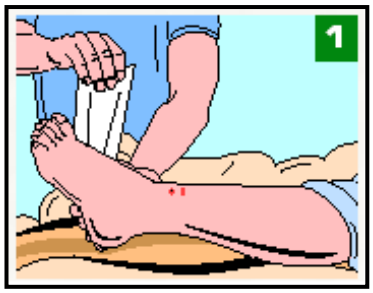
INTERNAL BLEEDING

- Cold clammy skin
- Pain
- Confusion
- Bleeding from orifices
- Rapid, weak pulse
- Thirst
- Pattern bruising

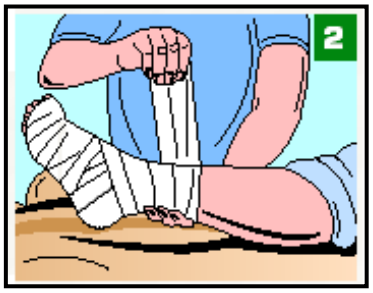
Treat as for shock, administer I.V. fluids, reassure and Evacuate ASAP.

Flucloxacillin should also be considered early as infection is a very real risk. Give 500 mg every 6 hrs for serious injury and 250 mg every 6 hrs for minor wounds. Ensure that medical opinion is sought.

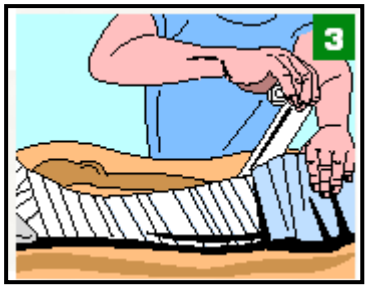
SNAKEBITE TREATMENT



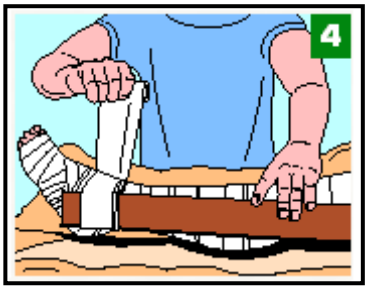
1. **From below the bite site, bandage upward on the affected limb (starting at the fingers or toes, bandaging upward as far as possible). Leave the tips of the fingers or toes unbandaged to allow the victim's circulation to be checked. Do not remove pants or trousers, simply bandage over the top of the clothing.**



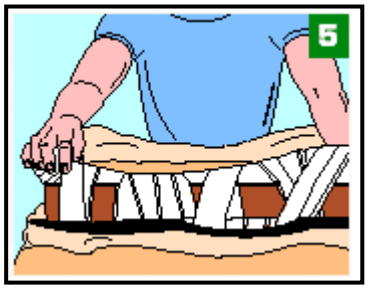
2. **Bandage firmly as for a sprained ankle, but not so tight that circulation is prevented. Continue to bandage upward from the lower portion of the bitten limb.**



3. **Apply the bandage as far up the limb as possible to compress the lymphatic vessels.**



4. **It is vital to now apply a splint. Bind a stick or suitable rigid item over the initial bandage to splint the limb. Secure the splint to the bandaged limb by using another bandage, (if another bandage is not available, use clothing strips or similar to bind). It is very important to keep the bitten limb still.**



5. **Bind the splint firmly, to as much of the limb as possible, to prevent muscle, limb and joint movement. This will help restrict venom movement. Seek urgent medical assistance now that first aid has been applied.**

BURNS

As long as the burn site is causing pain it should be kept immersed in cool water

Most burns are small in size and heal with no problems. In the tropics however they have a tendency to get infected easily and the infections are very difficult to treat.

Serious and deep burns do not always appear to be very bad at first; it can take up to a day before the full extent of the damage is visible.

DANGERS

Dehydration – burn victims are at a very great risk
Infection – the loss of skin integrity harbours many micro-organisms
Scarring – if poorly treated, healing will be slow and leave a bad scar
Shock – you should consider I.V. fluids early

TREATMENT

- Remove victim from cause of burn
- Resuscitate as necessary
- Treat for shock
- Give painkillers (avoid aspirin if bleeding)
- Remove clothing if not stuck directly onto burn
- Immerse in cool water or pour water over burn, keep doing so
- Drain large blister with a sterile needle but leave the skin intact
- Apply silver sulphadiazine (**Silverderm**) if available, cover with plastic film and evacuate
- If not - Apply a sterile non-stick dressing and evacuate

In cases of serious burns, a long way from help you can apply antiseptic cream using sterile gloves only if the container has not previously been opened. And you have no Silverderm.

Burns to the airway are likely in cases of fire and can swell to obstruct the breathing, do not wait to see if they worsen, evacuate immediately.

Serious burns are life-threatening and require specialist treatment extremely quickly, consider rapid evacuation to a major hospital.

Give pain killers early

STABILITY OF ALTERED FOREST ECOSYSTEMS (SAFE) PROJECT
RISK ASSESSMENT

HAZARD	DANGER	RISK LEVEL	PEOPLE AT RISK	CONTROL MEASURES	FURTHER MEASURES
Vehicles	Serious injury or death through road traffic accidents	High	Scientists and RAs	➢ Ensure that all drivers are approved by senior staff and aware of the heavy plantation vehicles in use on the roads in this area ➢ Drive at safe speeds and always within the vehicles' capability to keep control ➢ Do not drive when tired or after drinking alcohol ➢ Ensure that all vehicles are well-maintained and the tires are properly inflated – drivers to be responsible for checking the vehicle they are to drive ➢ Seat belts to be worn ➢ Training in driving off-road vehicles for inexperienced staff & scientists	➢ All vehicles to have first aid kits and fire extinguishers ➢ Driving by non-staff must be with the express, written permission of the senior scientist ➢ Roll-bars fitted to pick-ups ➢ Disciplinary action for dangerous or inappropriate driving ➢ First aid and fire extinguishers to be regularly checked ➢ Review emergency procedures regularly ➢ Any damage or vehicle problems should be reported
Tropical environment	Visitors getting heatstroke, sunburn or dehydration. Malaria and Dengue fever	Medium - high	Scientists and RA's	➢ Ensure that all visitors are aware of the need to acclimatise slowly ➢ Encourage non-locals to consume a lot of water ➢ Keep covered from the sun or wear sunscreen ➢ If they begin to feel too hot or ill they must be told to rest and cooled down ➢ Ensure there is no stagnant water in and around camp	➢ Ensure that all visitors are aware of the need to acclimatise and prepare themselves prior to coming to SAFE Project base camp ➢ RA's trained in recognition and treatment of heat illness and injury ➢ Advise medication etc. for short term visitors
Insects, bees, wasps, scorpions, centipedes etc..	Death through Suffering extreme allergic reaction and anaphylactic shock	Medium - high	Scientists and RA's	➢ Ensure that there is always a comprehensive medical kit on site ➢ Take care in the forest to watch out for centipedes, scorpions, bee and wasps nests ➢ Advise visitors to shake out their shoes in the morning	➢ Have visitors fill in a medical questionnaire before they come to SAFE Project base camp in order to identify those with known allergies ➢ RA's trained in recognition and treatment of anaphylaxis ➢ Be prepared to administer pain killers

Forest	Getting lost	Medium	Scientists and RA's	➢ Ensure that all visitors and scientists are always accompanied by research assistants when they go to the forest ➢ The duty manager is to monitor who goes into the forest and ensure that they are back safely ➢ All field teams to carry a radio and GPS each ➢ All forest workers to carry simple compass and whistle	➢ Basic instruction for all scientists before being permitted to work in the forest including self-help lost procedure ➢ RA's skilled at search and rescue Review emergency procedures regularly
Rivers	Drowning / injury from being carried by strong currents	Medium - high	All staff and visitors	➢ Consider carrying ropes in the field for roped river crossings	➢ Ensure that all teams working in the forest leave a route plan ➢ Ensure all staff know safe river crossing techniques and put in place a river crossing safety procedure ➢ Senior staff will have leave to declare the weather too dangerous to allow field work to continue and prevent any teams from going out to do so
Disease in water	Diarrhoea and vomiting	Medium	Scientists and RA's	➢ Ensure that all drinking water is boiled / Puritabs ➢ Ensure that the toilet facilities are cleaned daily and disinfected ➢ All visitors to be informed of the drinking water risks	➢ Monitor all cases of fever. ➢ Evacuation procedures in place ➢ All cases of illness to be recorded ➢ Review emergency procedures regularly
Poisoning	Diarrhoea, vomiting and salmonella	Medium	Scientists and RA's	➢ Ensure that food is prepared with clean hands and fruit and vegetables are washed in boiled water first (use alcohol-based hand gel) ➢ All meat and fish must be fresh or stored properly in a refrigerator or freezer ➢ Store rat poison safely	➢ Monitor all cases of fever. ➢ Evacuation procedures in place ➢ All cases of illness to be recorded ➢ Review emergency procedures regularly
Work tools – machetes (parangs), catapult etc.	Serious injury or death	Medium	Scientists and RA's	➢ Ensure that all tools are in good and complete condition ➢ Ensure that only staff and visitors who are competent with tools are permitted to use them	➢ Record all incidents in incident book ➢ Ensure first aid kit is maintained ➢ Ensure each team carries lightweight hammock stretcher ➢ Staff are encouraged to report concerns regarding equipment to senior scientist

Mechanical & electrical equipment – generator, grass cutters etc.	Serious injury or death through improper use or poorly maintained equipment	Medium	Scientists and RA's	➢ Ensure that proper protective equipment is used when necessary ➢ Equipment is only to be used by staff who are competent ➢ All equipment is well maintained	➢ Staff are encouraged to report concerns regarding equipment to senior scientist
Snakes	Staff or visitors getting bitten by venomous snake and suffering serious illness or dying	Medium	Scientists and RA's	➢ Remind visitors that there are venomous snakes in the forests of Sabah ➢ Ensure all wear trousers and adequate footwear ➢ Ensure that there are always staff trained in the treatment of snakebite on site ➢ Discourage the handling of snakes ➢ Basic training of scientists to include the avoidance of snakes	➢ Have staff carry laminated snake bite treatment cards with them in the forest ➢ Formally established evacuation procedure in place including helicopter support
Laboratory work	Injury from chemical spills, cuts from sharp objects Fire	Medium	Scientists and RA's	➢ Scientists advised to keep chemicals stored safely when not in use ➢ Protective clothing and equipment to be used ➢ Fume cupboard available for dangerous fumes ➢ Scientists advised to exercise extreme caution at all times when working in the lab	➢ Fire extinguishers and first aid kits provided ➢ Emergency exits kept clear at all times ➢ Emergency evacuation procedures in place ➢ Brief all new scientists and RAs ➢ Designated smoking zone
Trail clearing and forest maintenance work	Injury from chainsaw, Deadfall, Injury from environmental hazards	Medium	RA's	➢ Only trained staff to use chainsaw ➢ Protective equipment and clothing to be worn ➢ All environmental measures to be respected as directed by this document	➢ Staff trained in first aid ➢ First aid kit to be carried at all times in the forest ➢ Maintain protective equipment
Fire	Serious injury or death	Medium	Scientists and RA's	➢ Store kerosene, gas and other fuel safely and in designated area	➢ Fire extinguishers and first aid kits provided ➢ Emergency exits kept clear at all times ➢ Emergency evacuation procedures in place ➢ Brief all new scientists and RAs

					➢ Designated smoking zone
Mosquitos	Malaria & dengue fever	Low/ Medium	Scientists and RA's	➢ Eliminate breeding areas by removing all exposed standing water ➢ Encourage staff and visitors to keep covered at dawn and dusk and to wear repellent ➢ Advise visitors to seek malaria prophylaxis advice from their home countries medical authorities prior to departing	➢ Monitor all cases of fever. ➢ Evacuation procedures in place ➢ All cases of illness to be recorded
Working at height	Injury or death through falling	Low - medium	Scientists and RA's	➢ Ensure that everyone who climbs is trained to do so and uses appropriate safety equipment – helmets, harnesses etc.. ➢ Staff will not allow untrained or ill-equipped people to climb	➢ Full medical kit including spinal board & neck brace on site ➢ Senior scientist to be informed of intention to climb
Terrain	Injury due to falling over or deadfall	High	Scientists and RA's	➢ Take care with visitors who are new to the forest ➢ Walk slowly ➢ Wear appropriate footwear, not sandals. ➢ Scientists required to write destination and estimated return time on the board at SAFE Project base camp ➢ Scientists advised to carry compass, whistle, first aid kit and torch ➢ Staff and scientists advised to not enter the forest during heavy rain	➢ Medically trained and equipped search teams on-location to enter the forest at short notice ➢ Scientists advised not to work alone ➢ Review emergency procedures regularly ➢ Provide roped access on steep slopes
Mammals i.e. elephants, bears, wild boar etc.	Injury through being attacked	Low	Scientists and RA's	➢ Ensure that all staff and visitors are aware that they should always move away from mammals slowly and quietly ➢ Be especially careful of mothers with young ➢ Protecting camp from elephants.	➢ All scientists to be briefed before starting work ➢ Review emergency procedures regularly
Bridge failure / road degradation	Getting cut-off	Medium	Scientists and RA's	➢ During the wet season, keep one vehicle at Enforcement Camp at all times	➢ Ensure adequate supplies in case of isolation ➢ GIS of fresh water supply locations

INCIDENT REPORT FORM

SAFE Project

Duty manager to fill in this form following any incident or near-miss, Confidential

Reference:	Name: Date:
1. Subject:	
2. Incident (include date, time, location, background and build up to incident, people involved, witnesses if present, authors comments etc):	
3. Action Taken (facts):	
4. Follow up action / Recommendations (to prevent re-occurrence):	
5. Final Outcome:	
6. Duty Manager's comments: Signed: Duty Manager: Director:	
DISTRIBUTION:	

MISSING PERSON REPORT

DATE	

TIME	

YOUR NAME

NAME(S) OF MISSING PERSON(S)

TIME LAST SEEN	

WHO LAST SAW THEM	

WHO WERE THEY WITH	

WHO HAS REPORTED THEM MISSING	

WHAT HAPPENED

WHAT EQUIPMENT DO THEY HAVE

WHAT SKILLS DO THEY HAVE

WHERE WERE THEY LAST SEEN

WHERE WERE THEY GOING

WHEN DID THEY LEAVE	

WHEN WERE THEY LAST SEEN

WHEN WERE THEY DUE BACK

SEARCH AND RESCUE PLAN

DATE	
TIME	

SEARCH CO-ORDINATOR -

WHERE WILL THE SEARCH START -

WHERE WILL THE SEARCH BOUNDARIES BE -

HOW WILL THE SEARCH BE CONFINED (what rivers, ridges, trails and tracks are in the area) -

HOW MANY S&R TEAMS (Record names and team sizes) -

COMMUNICATION SCHEDULE & METHODS (time and method of situation reports) -

WHAT LANDMARKS CAN BE USED FOR REFERENCE ie, ridges, camps etc.. -

DOES THE MISSING PERSON HAVE ANY INJURIES OR DISABILITIES THAT ARE LIKELY TO SLOW THEM DOWN

SEARCH AND RESCUE TEAM DIRECTIONS

Take this with you on the search

Team name	**Names of searchers**

BACKGROUND –

Missing person(s) name(s) – _____

Place and time last seen – _____

Likely behaviour – _____

Equipment – _____

Any injuries or illness –

AREA TO BE SEARCHED –

EQUIPMENT (first aid kits, torches, stretchers, food etc.)

COMMUNICATION TIMES AND METHODS –

ADDITIONAL INFORMATION –

SEARCH AND RESCUE RECORD FORM -1

SEARCH CO-ORDINATOR –
DATE –
TIME -

MISSING PERSON NAME –
AGE –
NATIONALITY –
PASSPORT NUMBER -
NEXT OF KIN –
KNOWN MEDICAL HISTORY –

WHO REPORTED THEM MISSING -
HISTORY – WHAT HAPPENED -

SEARCH PLAN

SEARCH AND RESCUE RECORD FORM - 2

ACTIONS		
TIME	**EVENTS**	**SIGN**

EXTRACTS FROM THE

EXPLORATION MEDICINE COURSE

FIRST AID AND EMERGENCY RESPONSE SKILLS FOR REMOTE LOCATIONS

ASIAN TROPICAL FOREST ADAPTATION

COURSE MANUAL

CONTENTS

BURNS

As long as the burn site is causing pain it should be kept immersed in cool water.

Most burns are small in size and heal with no problems. In the tropics however they have a tendency to get infected easily and the infections are very difficult to treat.

Serious and deep burns do not always appear to be very bad at first; it can take up to a day before the full extent of the damage is visible.

DANGERS

Dehydration – burn victims are at a much greater risk
Infection – the loss of skin integrity harbours many micro-organisms
Scarring – if poorly treated, healing will be slow and leave a bad scar
Shock

TREATMENT

Remove victim from cause of burn
Resuscitate as necessary
Treat for shock
Give painkillers
Remove clothing if not stuck directly onto burn
Immerse in cool water or pour water over burn, keep doing so
Drain large blister with a sterile needle but leave the skin intact
Apply silver sulphadiazine (Flamazine) if available, cover with plastic film and evacuate
If not - Apply a sterile non-stick dressing and evacuate

In cases of serious burns, a long way from help you can apply antiseptic cream using sterile gloves only if the container has not previously been opened. And you have no Flamazine.

Burns to the airway are likely in cases of fire and can swell to obstruct the breathing, do not wait to see if they worsen, evacuate immediately.

Serious burns are life-threatening and require specialist treatment extremely quickly, consider helicopter evacuation to a major hospital.

SHOCK

“Severe circulatory disturbance characterised by drop in blood pressure, weak, rapid pulse, thirst and pallor”

Caused by trauma to the heart, circulating blood loss or blood vessel dilation.
Serious trauma involving bleeding (whether external or internal) is the most common cause of shock.
Serious infection can cause shock.

The priority here is to restore circulation to the body’s vital organs, to do this the victims should be laid down and their feet raised, keep them warm but do not actively heat.
Give I.V. fluids if available, preferably plasma or colloids to give volume.

SYMPTOMS

- A rapid weak pulse
- Pale, grey-blue skin
- Cold, Clammy Skin
- Weakness & giddiness
- Nausea
- Thirst
- Rapid shallow breathing
- Restless, anxious or aggressive
- Air hunger
- May become unconscious
- Finally, the heart will stop

RAPID EVACUATION IS ESSENTIAL ONCE THE CASUALTY IS STABILISED

RECORD ALL OBSERVATIONS AND TIMES

FRACTURES

Identify the injury first, fractures tend to swell immediately and there is often limb deformity.
Notable exceptions include rib fractures and breaks in the small bones of the hands and feet.

Is it bleeding? If so, treat the wound.
Immobilise limb with bandages, strapping or splints
Monitor CSM closely

CSM = CIRCULATION SENSATION AND MOVEMENT

- CIRCULATION – Capillary refill, colour of skin
- SENSATION – can they feel your touch?
- MOVEMENT – are they able to move their fingers / toes?

Loss of one or more of these functions is a sign of impaired circulation and is a serious problem, if this situation is not resolved there is a danger of further complications that may lead to loss of the limb.
It is usually caused by the displaced bone pressing on a blood vessel and preventing the flow of blood to the extremity, the only course of action is to reduce the fracture.

REDUCING FRACTURES

Where the blood supply to the extremities is compromised (CSM is affected)
To prevent bleeding
To allow splinting for evacuation in cases of severe displacement
To relieve pain

HOW TO REDUCE A FRACTURE

- Give painkillers ten minutes before starting if possible
- Have helpers steady limb & casualty
- Slowly & firmly pull limb out to length
- Gently move the limb back into position
- Maintain the pull whilst checking CSM
- Splint & evacuate ASAP

SPINAL INJURIES

RECOGNITION

- Pain in the neck or back
- A step in the normal spinal curve
- Tenderness on gently feeling the spine
- Loss of control of one or more limbs
- Abnormal sensations i.e. tingling
- Disorientation or bewilderment
- Difficulty in breathing

In cases of severe trauma such as a road traffic accident, or a fall from height, spinal injury should be suspected and the spine stabilised as a matter of course.

SPINE STABILISATION

The neck and back must be held in-line and not be allowed to twist, move forwards, backwards or side to side.
Once spinal stabilisation has commenced it must be maintained all the way to hospital until a doctor decides it is no longer necessary.
Use padding, tape, bandages and hands to ensure that the neck and back stay in-line.
Learn to log-roll and constantly check CSM.

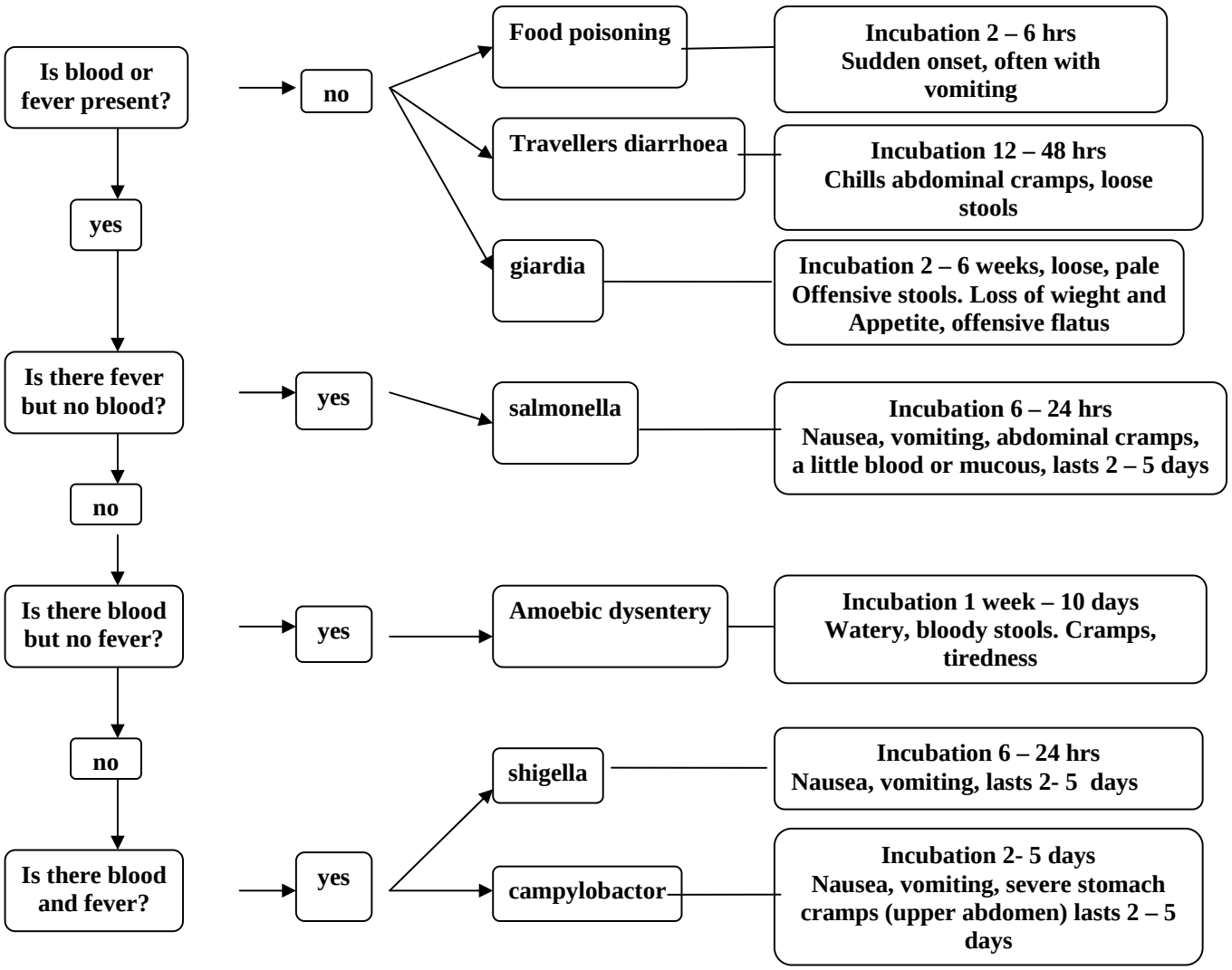
In cases of suspected spinal injury helicopter evacuation is indicated, only use a stretcher if there is no vehicle or helicopter options.

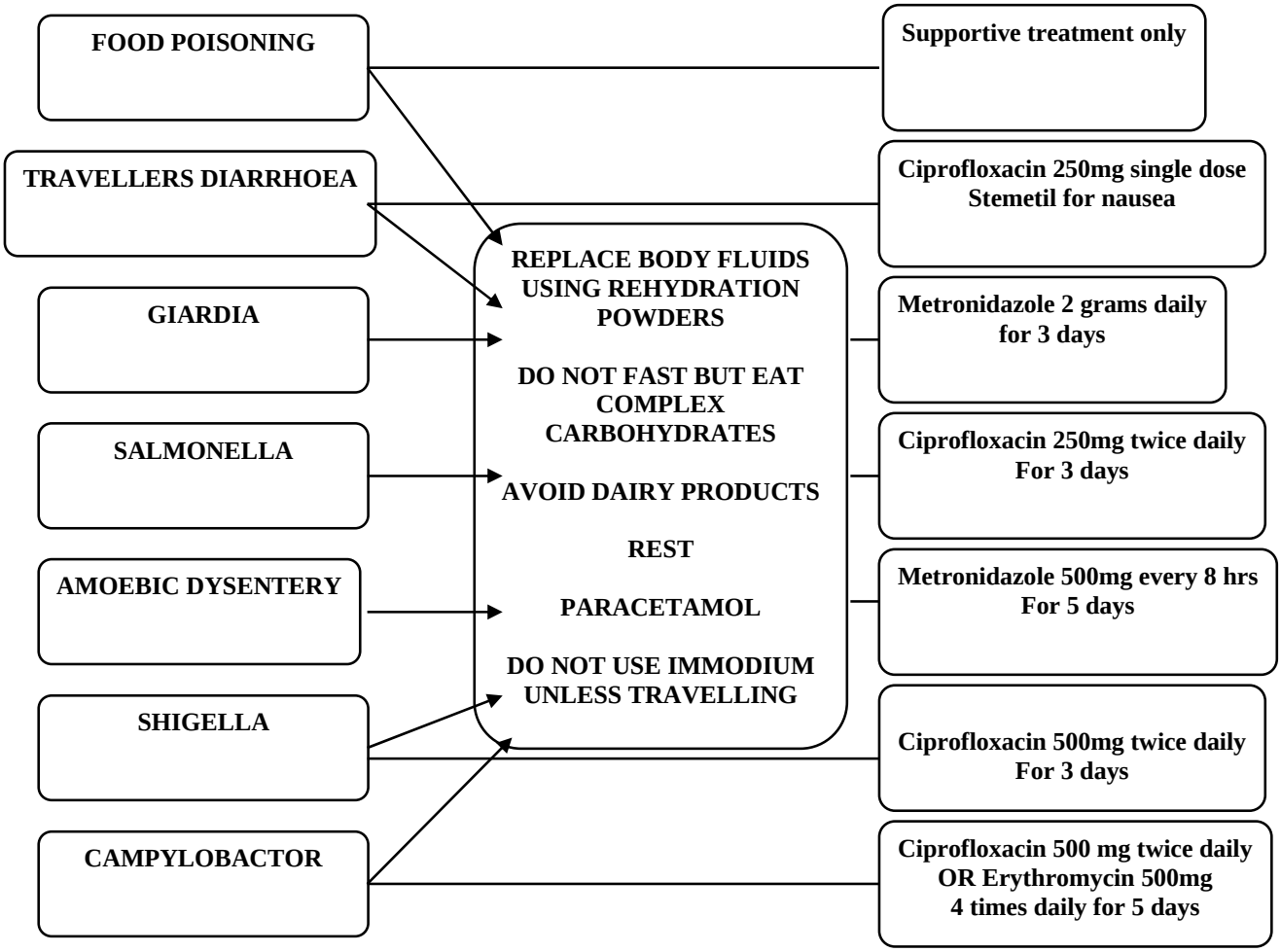
DIARRHOEA

Most new arrivals to tropical countries will encounter bowel symptoms of some kind, often they will get one or two episodes of loose stools, this is usually not diarrhoea but the gut becoming accustomed to small amounts of the resident bacteria.

The term Diarrhoea is used to describe a condition where the sufferer has three or more episodes of loose stools a day.

However, Diarrhoea can be a serious symptom of an underlying infection and should not be ignored, it can lead to death in some cases





For people suffering with diarrhoea you need to monitor them closely, take their temperature regularly and monitor their fluid and food intake and output.

There is a real danger of dehydration, especially if vomiting is also a problem. Ask them about the presence of blood.

Use rehydration salts after every motion.

Diarrhoea will make the sufferer very weak and more likely to suffer heat intolerance. Rest is essential.

ANAPHYLAXIS

- A reaction of the body to toxins or substances that it is sensitive to -

Symptoms
Rash – difficulty breathing – nausea & vomiting – swelling above the neck – rapid heart rate – shock (reduced BP / collapse)

Causes
Insect bites or stings – reaction to drugs – allergy to food

In mild cases give Piriton (chlorpheniramine) orally and monitor the patient very closely, *Piriton is effective in reducing the reaction to stings and bites*

RAPID DETERIORATION

Collapse -
1st priority is to maintain the airway – recovery position
Monitor and record all events / treatment
Give Epinephrine (adrenaline) using the Epi-pen or alternative and initiate evacuation.
Monitor closely, record pulse, respirations (breathing) and skin colour.

If they deteriorate further it may be necessary to give a second injection.

All patients who suffer an anaphylactic reaction must be evacuated.

Beware – rebound phenomenon – recurrence of anaphylaxis some hours later.

Many people who have severe allergies carry an 'EpiPen' which delivers 0.3 mg of adrenaline, *all team members must be aware who they are and know how to help them.*

ANTIBIOTIC THERAPY

Never administer any medication without the victims permission.
Always ask if they have any allergies or if they have taken this antibiotic before.
If they show signs of an allergic reaction stop the treatment immediately and administer Piriton (Chlorpheniramine).

Only administer antibiotics when you believe that they will prevent serious infections or a threat to life and always endeavour to get the victim to a medical facility for qualified appraisal at the earliest opportunity.

If the victim has ever had a reaction to a penicillin they MUST NOT be given a drug from this group (Flucloxacillin, Amoxycillin)

Antibiotics must be given in complete courses to be effective, please follow the instructions on the packaging and always ensure the course is finished, usually a minimum of five days, even if the symptoms appear to have gone.

Most antibiotics can cause nausea, vomiting, diarrhoea and low appetite.

All the following guidelines are for orally administered medication only.

ANTIBIOTIC	TO TREAT	DOSE	BEWARE
Flucloxacillin	Wound infections Skin infections Ear infections	500 mg every 6 hrs	10% of people react to these antibiotics from mild rash to anaphylaxis
Amoxycillin	Wound infections Skin infections Ear infections Dental infections Chest infections	500 mg every 8 hrs	10% of people react to these antibiotics from mild rash to anaphylaxis
Erythromycin	All the above conditions when there is a known sensitivity to penicillin	500mg every 6 hrs	Do not give when they are taking Triludan or Hismanal (antihistamines)
Ciprofloxacin	Campylobacter Salmonella Typhoid Shigella	500 mg every 12 hrs	History of epilepsy
Trimethoprim	Urinary tract infection	200 mg every 12 hrs	
Co-Amoxiclav	Animal bites	250 – 500 mg every 8 hrs	

INTRAVENOUS THERAPY

In order to treat a casualty for shock or heat stroke it may be necessary to administer intravenous fluids to keep them alive.

When is it necessary?

Following severe trauma that has caused major injuries such as broken bones or a lot of blood loss.

Following collapse due to heat stroke when a casualty is in obvious difficulty knowing where or who they are and have been exposed to factors that may have caused them to get very hot (working in the heat, not drinking sufficient water).

During severe illness such as fever or dairrhoea where they are unable to drink fluids and are losing them through having a high temperature or vomiting and diarrhoea.

What are the risks?

Local infection – this can be caused by using equipment that is not sterile or by not having sterile gloves on. This is not life-threatening but should be avoided.

Blood infection – this is caused by administering fluids or drugs that are contaminated, always ensure that the liquids you inject are from sealed containers and they are in date.

Prepare all your equipment first, you will need;

1) Sterile gloves (in an emergency these are not totally essential)
2) Alcohol wipes
3) 5 or 10 ml syringe with sterile saline
4) I.V. cannula
5) Tape
6) Cotton wool or gauze
7) I.V. fluids that you will be connecting
8) Giving set.
9) Tourniquet

Technique –

Get the casualty as comfortable as possible, lie them down if possible and explain what you are going to do and why – you must get a verbal consent from them before you start, if they refuse you are assaulting them!

Ensure that you have good light to work in.

First expose their arm up to the bicep and ensure that you can locate a vein there, wash your hands as thoroughly as possible, take your time to do this and get completely clean.
Prepare your working area, open the gloves, needles, swabs, syringes, and gauze.
Cut three lengths of tape about three inches long.

Open the I.V. fluid bag and giving set and attach the giving set, run the fluid through the tubing then flick the tubing to remove bubbles. (small bubbles are not dangerous but it is best to avoid them going into the vein). Keep the cover on the end of the tube until you are ready to attach it to the casualty.
Hang the bag nearby where the tube can reach the casualty.

Now take your time to examine the site for the cannulation, palpate (feel) the vein on the inside of the elbow, just below the crease. Ask the casualty to make a tight fist a few times, this will fill the vein up and make it more visible.
Now clean the area well with the alcohol swab and put on the gloves.
Fill the syringe with saline and put to one side.

Take the cover from the cannula and aim the needle at a 45 degree angle to puncture the skin just above, or slightly to one side of the vein.
Now aim the needle more directly up the arm and push in slowly to the vein, when you have entered a vein the cannula with “flash” with a little blood in a chamber by your hand to show that you are in the vein. Push in another few millimetres then separate the needle from the cannula and slowly push the cannula in while holding the needle steady.

Now you have to take out the needle whilst pushing down hard on the vein above the cannula, put the needle somewhere safe and obvious and pick up the syringe that is filled with Saline, take off the white cap on the

cannula, connect it to the cannula and push some of the saline into the vein, it may feel quite stiff at first. Make sure that the cap you take off is put down somewhere sterile
If the saline will not go in or a lump suddenly appears next to the vein you will have to remove the cannula and start again, you will not have done any harm.
If the saline goes into the vein you must now tape the cannula to the skin to stop it coming out. First disconnect the syringe and replace the cap, then firmly tape the cannula to the skin.

Now you need to take the Fluid tubing (giving set), check that it is pull to the end with fluid and attach it to the cannula after taking off the white cap again.

Open up the fluid lock on the tubing and allow the fluid to run into the vein.

Note;

Once you have initiated I.V. therapy you must be responsible for monitoring it and recording what you put in and when.

If the site of the cannula starts to look red or swell up, you need to discontinue the fluids and take out the cannula.

If the casualty bends his/her arm the vein will close off and the fluid will not run.

In cases of shock the fluid should be allowed to run in as fast as possible, when the bag is empty, lock the tube and put up a new bag, if all the fluids run out then disconnect the tubing and replace the white cap, it will save the doctor time at hospital if the casualty already has I.V. access.

MALARIA AND DENGUE FEVER

Malaria and Dengue are present in Sabah and to some extent can appear very much like each other, they are also notoriously difficult to diagnose.

MALARIA

Malaria is spread by female mosquitoes' bites, between dusk and dawn
The incubation period for malaria is **10-14 days**

The Malaria Cycle

- The mosquito picks up parasites by biting infected humans
- Parasites are passed to another human
- Parasites enter the blood stream & migrate to the liver to multiply

Diagnosis of Malaria

Malaria often appears like flu,
Headaches
Tiredness
Muscle pains
Loss of appetite
Fever, Usually cyclic -
Cold – shivers, rigors, vomiting
Hot – up to 41. C, flushed appearance, rapid heart rate
Sweating – can be sudden and copious
Sleep
Weakness cause by anaemia
Occasionally jaundice – yellowish appearance
- Malaria is notoriously difficult to diagnose, even in hospital.

If you suspect malaria begin treatment and evacuate

Quinine Sulphate 600mg
every 8 hours for 7 days
Treat the symptoms, give pain killers
Evacuate to hospital

DENGUE

Transmitted by daytime feeding mosquitoes
These are most active during dawn & dusk

Prevention Methods

- Cover up with long sleeves, trousers & socks
- Use insect repellents
- Treat cloths with permethrin

Diagnosis of Dengue Fever

- Irregular fever
- Flu-like illness
- Sweating phase
- Jaundice
- Anaemia
- Pain in joints

The most important thing is to kill, exclude, repel and avoid mosquitoes to prevent bites.
Wear light coloured clothes, long trousers and sleeves in the evenings and mornings especially.
Avoid perfumes and flower patterned clothing. Use a net at night, burn mosquito coils and wear repellent.

HEAT ILLNESS

Acclimatisation and Heat related injury

Any person moving from a temperate to a tropical environment is likely to suffer the effects of the heat. The risks of serious illness are very real and cannot be underestimated. Prevention is obviously the key to reducing incidences of heat related illnesses but in some cases rapid recognition of symptoms is essential to prevent serious complications or even death.

Risk Factors

High temperature	Medication
High humidity	Recent alcohol consumption
Insufficient fluid intake	Age (young / old)
Poor shade	Obesity
Incomplete acclimatization	Sex (female less heat tolerant)
Poor fitness	Underlying chronic illness
Previous heat intolerance	Concurrent illness

Acclimatization

Full acclimatization to the tropical environment can take up to two weeks. Exercise is essential for acclimatization to occur.

Fluids:

Dehydration is probably the biggest danger for someone new to the jungle and correct fluid management is essential to prevent it. Excessive water intake can also cause serious problems by diluting the body's salts.

Urine colour and volume is the best guide to hydration status, though not infallible. Your urine should be straw-coloured, ie barely any colour. Dark yellow indicates dehydration as does a decreased urine output. Less than three pee's a day should be a cause for concern.

Excessive urine output (diuresis) may indicate kidney dysfunction and is sometimes marked by the need to urinate more than once during the night.

A general guide to fluid requirements in the tropics is as follows;

At rest -	5-7 litres a day
During exercise -	½ -1 litres an hour

The best guide to hydration is urine output. Sufficient fluid needs to be drunk to produce 2-3 bursting bladders full of clear urine a day.

Heat related illness

Recognition

The following symptoms indicate that heat illness should be considered, especially if they occur in the first two weeks or during or immediately after exercise.

Headache	**Lethargy**	**Weakness**
Nausea	**Confusion**	**Collapse**
Anxiety	**Dizziness**	**Poor coordination**
Fatigue	**Diarrhoea**	**Vomiting**
Poor judgement	**Convulsions**	**Unconsciousness**

Failure to recognise and act at an early stage can result in rapid deterioration into unconsciousness and even death. Treat all those with any of the above symptoms as heat illness victims until otherwise proven. Many people are intolerant of heat untill properly acclimatised.

Treatment of heat related injury

1. Stop activity for the whole team, if one person is suffering the chances are that more will follow.
2. Record temperature, pulse and blood pressure. If there is any confusion, disorientation or deterioration of motor functions, eg loss of balance, record Glasgow Coma Scale.
3. Ensure accurate recordings are made throughout.
4. Beware of low Blood Pressure – often precedes collapse.
5. Lay the casualty down and raise the feet.
6. Cool the casualty by fanning, pouring water over them and removing clothing.
7. Give plenty of fluid to drink, consider IV saline if vomiting.

If the casualty is unconscious;

1. Check their airway, breathing and circulation.
2. Place in the Recovery position.
3. IV saline may be administered by a medic
4. Cool using above methods.
5. EVACUATE.

FINALLY

As a first aider with useful skills you now fullfill a new role at work, at home or wherever you go. The skills you have may save a life or two so try to remember;

Always explain what you are doing to the casualty and ask their permission to do what you want to do.

Unconscious patients should be treated with the same dignity and respect that conscious ones do.

Do not put yourself or your team in any extra danger while trying to administer to a casualty, consider the risks.

Always try to be prepared for a casualty, know where the first aid and rescue equipment is and when you use it, repair and replace afterwards.

The psychological effects of trauma on victims, witnesses and first aiders can be serious, you may need to look after those with no physical injuries as well as the bodily injured.

Sometimes despite all our efforts, casualties die, when this happens you must be careful not to declare them as dead, only a doctor can do this. Treat the body with respect and try not to move anything unless it is absolutely necessary until the doctor or police allow you to do so.

This course can only offer you the opportunity to learn, for you to truly become competent you must refresh your memory and skills as often as possible.

Health and Safety in a Jungle Environment for Field Workers

Course Booklet

2011

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TROPICAL FOREST SAFETY

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Section One - Medical

ACCLIMATISATION AND HEAT RELATED ILLNESS

Acclimatisation

Any person moving from a temperate to a tropical environment is likely to suffer the effects of the heat. The risks of serious illness are very real and cannot be underestimated. Prevention is the key to reducing incidences of heat related illnesses but in some cases rapid recognition of symptoms is essential to prevent serious complications or even death.

Full acclimatisation to the tropical environment can take up to two weeks. Exercise is essential for acclimatisation to occur - approximately 60-90 minutes per day is sufficient.

Heat Related Illness

Risk Factors –

High temperature
High humidity
Insufficient fluid intake
Poor shade
Incomplete acclimatisation
Poor fitness
Previous heat intolerance
Medication
Recent alcohol consumption
Age (young / old)
Obesity
Sex (females are less heat tolerant)
Underlying chronic illness
Concurrent illness

Fluids:

Dehydration is probably the biggest danger for someone new to the jungle and correct fluid management is essential to prevent it. Excessive water intake can also cause serious problems by diluting the body's salts.

Urine colour and volume is a good guide to hydration status, though not infallible. Your urine should be straw-coloured, i.e. barely any colour. Dark yellow indicates dehydration, as does a decreased urine output. Less than three pee's a day should be a cause for concern.

Excessive urine output (diuresis) may indicate kidney dysfunction and is sometimes marked by the need to urinate more than once during the night.

A general guide to fluid requirements in the tropics is as follows;

At rest - 3-5 litres a day

During exercise - ½ -1 litres an hour

The best guide to hydration is urine output. Sufficient fluid needs to be drunk to produce 2-3 bursting bladders full of clear urine a day.

It is worth remembering that salt tablets are not absorbed, a good dietary intake of salt is required to replace the salt lost through sweating.

Recognition:
The following symptoms indicate that heat illness should be considered, especially if they occur in the first two weeks or during or immediately after exercise.

Headache	**Lethargy**	**Weakness**
Nausea	**Confusion**	**Collapse**
Anxiety	**Dizziness**	**Poor coordination**
Fatigue	**Diarrhoea**	**Vomiting**
Poor judgment	**Convulsions**	**Unconsciousness**

Failure to recognise and act at an early stage can result in rapid deterioration into unconsciousness and even death. Treat all those with any of the above symptoms as heat illness victims until otherwise proven. Many people are intolerant of heat untill properly acclimatised.

Treatment of heat related injury:

1. Stop activity for the whole team, if one person is suffering the chances are that more will follow.
2. Record if there is any confusion, disorientation or deterioration of motor functions, eg loss of balance.
3. Beware of low Blood Pressure – often precedes collapse.
4. Lay the casualty down and raise the feet.
5. Cool the casualty by fanning, pouring water over them and removing clothing.
6. Give plenty of fluid to drink, if vomiting they will probably require IV care.

If the casualty is unconscious:

1. Check their airway, breathing and circulation
2. Place in the Recovery position
3. IV saline may be administered by a medic
4. Cool using above methods
5. Evacuate

BASIC FIRST AID

Wounds

Any break in the skin should be treated as an open wound; it should be cleaned and covered until it is almost healed. Savlon or antibiotic ointment can be applied if it is not too deep, do not put powder on once the skin is broken.
For large wounds the first consideration is to stop the bleeding, use a dressing and pressure over the wound until it stops bleeding.
Redness, localised heat, pain and swelling are all indicators of infection as is discharge such as yellow puss or an unpleasant smell. If infection is present you should re-clean the wound and seek a medical opinion.

Broken bones

There is usually instant swelling at the site of a bone fracture and often easily identifiable disfiguration though occasionally it can be hard to tell if a bone is broken, i.e. toes and ribs.
If there is any suspicion that a bone is broken you should immobilise the limb and evacuate the victim as safely as can be done.

Tropical illnesses

Without considerable medical knowledge and skills it is almost impossible to diagnose a tropical disease in the forest environment but there are a few basic rules you should follow;

1. A high temperature is always a cause for concern and the victim should be evacuated to a medical facility.
2. Malaria and Dengue fever can be killers if not treated.
3. Reduce fever with cool water, shade and removing clothing.

Burns

Serious burns do not usually appear serious at first so always consider evacuation at the earliest opportunity.
Use cold water on the burn for a prolonged period of time, immerse in a river if practical.
Use a non-stick dressing or leave exposed rather than risk having a dressing stick to the burn.
Dehydration is a major risk for burns victims so relocating them to a medical facility where intravenous therapy can be given is a priority.

HEALTH AND HYGIENE

Staying fit and healthy whilst you are living amidst all the bacteria and microscopic life in the tropics depends on your ability to take care of yourself and protect your body from invasion. You have to adopt rigorous personal hygiene habits and stick to them religiously.

Washing:

It is important to wash thoroughly on a twice-daily basis. Pay particular attention to parts of the body that become very sweaty such as armpits and groin. Consider using drapoline (nappy-rash cream) or talc.

Immersion Foot and Athletes' Foot:

Your feet are your most important asset. Inspect and wash them regularly and powder them each night and morning. Massage your feet each and every night. At every available opportunity remove boots and socks and air your feet. If prone to blisters consider preventative measures such as applying zinc oxide tape or Vaseline to your feet. Keep toe-nails short and square edged. Failure to correctly look after your feet can give rise to either athletes foot or, in worse cases, immersion (or trench) foot. This can result in a team member who is unable to walk and therefore unable to function usefully.

Fungal infections:

The feet and groin are frequent hosts to 'fungals' which can end up being extremely painful and seriously debilitating. If left untreated such infections can render the person unfit. Cleanliness is the best preventative measure. Using anti fungal cream or powder on the feet, groin and armpits will prevent it as long as they are regularly washed and kept as dry as is possible.

Ringworm:

This is a fungal infection without the presence of worms. It is caused by the humidity and **can be prevented by keeping clean**. Symptoms are extreme itching and discomfort. It is recognised by characteristic red rings. It requires specific medication to cure.

Wound infections:

Wounds heal fairly readily in desert climates provided that flies are kept away from the wound. In the humidity of the jungle minor wounds readily become infected. Infected wounds may vary from painful, unsightly and oozing wounds which eventually heal with scarring, to life threatening conditions such as cellulitis, abscesses and septicaemia.

Prevention is better than cure; minor wounds must be cleaned and dressed carefully. Wash hands carefully and clean the wound with an antiseptic such as tincture of iodine. Cover with a plaster or gauze bandage. Redress wounds regularly, particularly if the wound is oozing. Consider the use of antibiotics early.

Infected bites:

Prevent your insect bites from becoming infected. Do not scratch infected bites. If bites become infected too badly the infection can spread to the blood.

Insect bites:

There are various other hygiene problems prevalent in the jungle such as ticks, leeches, and allergic reactions to insect bites, which can be discovered if individuals regularly inspect their bodies.

Diarrhoea:

This is characterised by passing over three loose stools in a day. Diarrhoea and vomiting (D&V) is a common ailment, it is seriously debilitating and needs aggressive treatment. More serious forms can involve the presence of blood in the stools or are accompanied by fever and need specific antibiotics and treatment from a medic. Diarrhoea in any form can spread very quickly within a team. Wash your hands before cooking and after using the toilet. Do not share any eating utensils, mugs etc. If you have any form of diarrhoea inform all other team members. It will rule the individual out of any duties involving the preparation of food.

Treatment generally consists of rest and giving replacement fluids (such as Dioralyte). Give little and often if vomiting is a problem. You can give Paracetamol for fever and cramps. DO NOT FAST - but avoid dairy products. Complex carbohydrates are best. Use Immodium or Lomotil if necessary but avoid too much as you will get constipated.

Cleaning / airing of equipment and clothing:

Sleeping bags need to be aired regularly, towels cleaned, clothing at least rinsed in water each day and hung up to dry. If you use a sarong do not use that or your towel as a blanket at night, it is unhygienic. Dry out your boots whenever possible!

WATER PURIFICATION

It is important to ensure all the water you drink is purified. The presence of harmful micro-organisms in most of the water found in the tropics can be guaranteed. With water standards being so high in Europe our immune system is not equipped to neutralise these alien irritants, therefore they are, at the very least going to cause a nasty dose of diarrhoea and its accompanying bellyache, at worst, a life-threatening situation.

The sheer quantities of water that are needed to keep hydrated means that you will need to get good at understanding and the practice of treating water.

Iodine:

Iodine Tinctures are specifically made for water purification and so are manufactured to the correct alcohol/iodine mix.

Iodine is added at 3 or 5 drops per litre of water (read the label), shake well and leave for half an hour. The worst protozoa take longer to kill so if you drink it too soon you still run the risk of being exposed to the biggest dangers.

Boiling:

Boil water for five minutes at a rolling boil. If you are at an altitude or 2000m or more, then you should boil the water for ten minutes.

Chlorine Tablets:

Used by the military, does not work on Giardia but is very simple and convenient.

Collecting Water:

Water should be collected from fast flowing parts of the river. There, it is generally a lot cleaner and there are fewer insect spores as they lay their eggs on still water.

If the river has dried up and there is a pool left it often becomes stagnant. Look for signs that animals still use it. If there is surface scum, sweep it away with your hand before drawing the water. If there are no signs of life at all, beware. Doubling the quantity of the purifying agent tastes nasty but will destroy the bacteria.

Methods for Settling, Decanting and Filtering Dirty Water:

Clear water bottles are the best for this but with most sediment, two or three hours of standing usually settles it out and carefully pouring all but the last twenty percent will separate the clear water out. Filtering through cloth and millbank bags are all ways of filtering. It must be recognised that filtered water still needs treating.

SECTION TWO - ENVIRONMENT

Hazards

Environmental hazards exist in all environments; familiarity and experience will reduce the danger that these hazards pose.

FLORA

There are a few things that everyone who lives or works in the jungle needs to watch out for:

Deadfall]] – A huge risk to everyone in the jungle, dead wood hanging in the canopy or tangled in vines that periodically falls to earth, often after rain or wind, sometimes whole trees come down! Be sure to check the canopy above anywhere you will be working or staying and be especially careful during rain and storms.

Thorns / Rattan]] - Also called "wait-a-while" thin vines with sharp thorns on. You need to stop, reverse and carefully untangle yourself from these. Do not attempt to pull through them – you and your clothing will be damaged. Take care when you release them.

Spiky trees]] - These trees are found in most jungles and have sharp spikes all over them. They often grow in places where the ground is uneven and right where you instinctively reach out for support. The spikes cause splinters and can easily become infected. Look before you touch or grab any trees.

Other hazards to human traffic in the jungle are as follows:

Poisonwood Trees] - These trees elicit an allergic response in those sensitive to the sap and it can be quite severe. If you notice a rash developing take care not to touch your face and make your way back to safety. The rash rarely has any long term effects other than pain and itchiness.

Roots and vines – These are not always easy to spot but very easy to trip over.

Fallen trees - Sometimes you will have to scramble over tree trunks and through debris from a tree fall.

Fruits and berries – These are only a hazard if you are tempted to eat them.

FAUNA

The main things in the jungle that may be an irritant to you are the smaller inhabitants such as insects and leeches. The mammal population has no desire to

bother humans. However, in many cases much of the flora and fauna has a defensive capability that you need to be aware of.

Mosquitoes - Carry malaria and dengue fever. Use repellent and wear appropriate clothing. Prevention of bites is important.

Sandflies – Usually close to rivers, very small black insects whose bite causes a lot of itching. Avon 'Skin-so-Soft' lotion is known to keep them off.

Bees / Wasps – May occasionally swarm. Their nests usually resemble grey paper bags and hang in trees, on branches, in tree trunks and under palm leaves. Be observant as you move undergrowth. If attacked, cover up and wait for them to pass.

Flies - Horse flies, black flies and many others can be found in the jungle, some of them can give you a nasty bite. Use repellent to deter them and antihistamines after a bite.

Leeches - Do not carry disease. Use repellent to deter and remove.

Scorpions – These can give a nasty sting and they like hiding in dark places such as bags and boots. Keep your pack sealed up and boots on sticks or sealed in a plastic bag overnight (check inside them each time you put them on). Always be careful where you put your hands.

Spiders - Tarantulas are fairly common in the jungle as are other biting spiders. None are aggressive unless provoked and few can do serious harm to you.

Centipedes – Fast moving, with antennae, these beasts like to get into clothes and sleeping bags while you are not there and they give a very nasty bite, always shake out your sheets and clothes and if you see one, make sure it goes away!

Caterpillars, moths - many and varied in the rainforests, some are very beautiful. Do not be tempted to touch them as they can be poisonous and give a bad rash / burn from their whiskers / wing dust. **Remember** - Brush off spiders, scorpions and hairy caterpillars in the direction they are travelling in. Use something other than your hand. Try not to panic, remain calm and you should avoid being bitten or stung.

Ants – Ants anywhere can give a nasty bite or sting. Some spray a formic acid. They are best avoided. Do not disturb ants' nests and look before you sit down.

Wild Boar – Travel in families but are not known to be aggressive unless threatened or protecting young.

Crocodiles - Very aggressive man-eaters. They are very rare in hilly jungle, but prevalent in lowland rivers and estuaries. Keep an eye out for larger ones during river crossings and when close to river banks. Crocodile learn habits, try not to visit the same part of a riverbank more than once.

Monkeys- Can get aggressive if provoked. Move away from them. Sometimes they drop things on you, most are completely harmless. In close encounters, avoid direct eye contact and don't show your teeth, look to the side or down, they are less likely to become aggressive.

Cats - Leopards, Leopard cats, Marbled cats, Bay cats, flat headed cats are to be found in the jungle. If you see one you are very lucky. They are elusive and offer no threat unless you are between a mother and her young.

Civets – Will come into camp foraging but never attack humans, the Binturong or bear-cat is the only one seen to display aggression to humans.

Sunbears - Can be very aggressive if surprised but generally move away when disturbed.

Elephants - Elephants have poor eyesight so hiding behind trees works well. They make a lot of noise and give a lot of warning but will happily stroll through a camp and destroy it. Be prepared to move away from them if you see them.

Snakes - Will usually strike if threatened or stood on. When you see a snake, the procedure is to move away slowly and alert others to it. Never try to catch a snake or kill one.

Domestic Animals – It is better to avoid dogs and cats as a precautionary measure.

Conclusion

Whilst it is important to recognise certain hazards, the risks posed by jungle flora and fauna are low. If you remain observant in the jungle and slow down your movements you should not have any bad encounters.

As most tropical rainforest fauna is nocturnal you will encounter very little by day but at night you will need to exercise considerably more caution.

OTHER DANGERS:-

Rivers –

Rivers in the rainforest can rise with alarming rapidity and turn from a benign babbling brook into a raging debris-filled torrent in very little time at all.
It does not have to be raining in your vicinity for this to happen so will often take you by surprise.

Look for high tide marks on the river banks for an indication of how high a river gets and determine if it is likely that you will be trapped on the wrong side if it floods.

In mountainous areas carry a rope if you are likely to cross a flood-prone river, use it to tie a handrail when you cross over and leave it there for your return journey. Avoid the outside of bends in flooding rivers and always keep a look out for debris such as logs being carried by the water.

Always face upstream when fording rivers.

Look out for crocodiles and snakes.

Snakebite

Snakebites are very rare, rarer still are bites from snakes with dangerously toxic venom and yet rarer are cases where the snake has envenomated with a potentially lethal dose. However, all bites must be treated as a worst-case scenario and snakebite victims should always be evacuated to a hospital as a matter of course and with utmost urgency.

1. As soon as possible, apply a broad pressure bandage from below the bite site, upward on the affected limb (starting at the fingers or toes, bandaging upward as far as possible). Leave the tips of the fingers or toes unbandaged to allow the victim's circulation to be checked. Do not remove pants or trousers, simply bandage over the top of the clothing.

2.Bandage firmly as for a sprained ankle, but not so tight that circulation is prevented. Continue to bandage upward from the lower portion of the bitten limb.

3.Apply the bandage as far up the limb as possible to compress the lymphatic vessels.

4.It is vital to now apply a splint. Bind a stick or suitable rigid item over the initial bandage to splint the limb. Secure the splint to the bandaged limb by using another bandage, (if another bandage is not available, use clothing strips or similar to bind). It is very important to keep the bitten limb still.

5.Bind the splint firmly, to as much of the limb as possible, to prevent muscle, limb and joint movement. This will help restrict venom movement. Seek urgent medical assistance now that first aid has been applied.

This person now requires evacuation by stretcher and must not be allowed to get up and move around, staying still is vital.

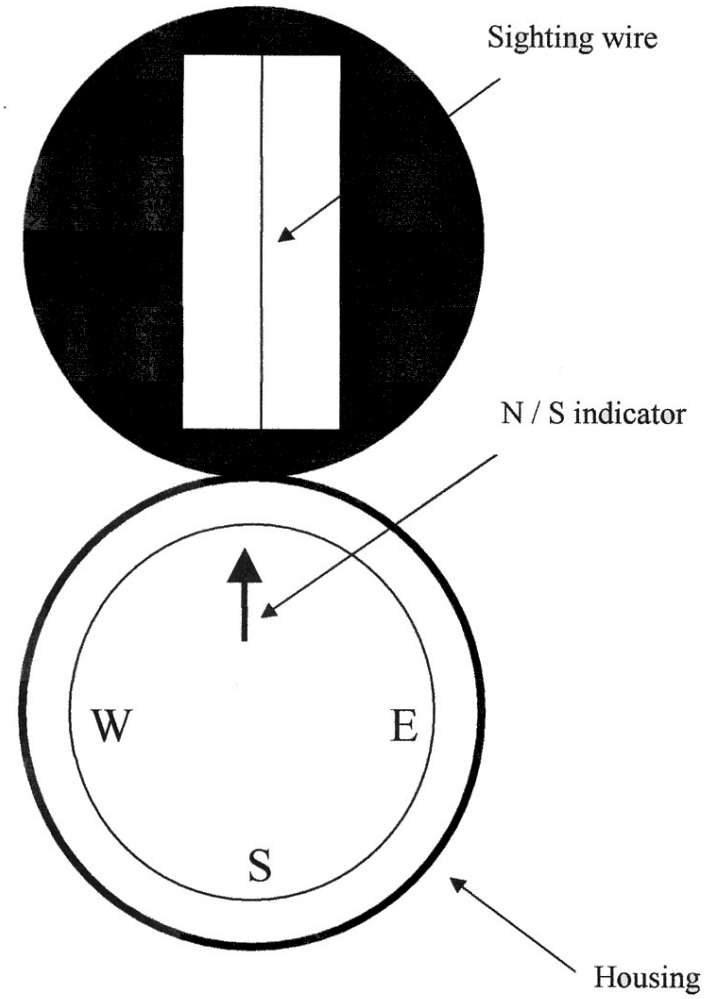
1. **Ensure the snake is no longer a threat.**
2. **Call for help if available.**
3. **Calm and reassure victim, get them to lie down.**
4. **Examine bite site & remove clothing from limb.**
5. **Wash bite site and cover with clean dressing.**
6. **Bandage from extremity towards heart not too tight.**
7. **Apply a splint.**
8. **Evacuate as a matter of utmost urgency.**

If at all possible try to identify the snake but do not put yourself in any danger by doing so!

Navigation

For the scientist working in tropical forests, the need to navigate is rare, you should always have a research assistant or guide with you. It is often relevant however to know your whereabouts and to be able to orientate yourself especially if your study takes you further into the forest. In cases where you are lost or disorientated, the ability to work a compass becomes invaluable.

Navigation in the jungle is considerably different to navigation in the hills and mountains of Europe. The jungle presents its own array of features and obstacles and you will need to familiarise yourself with how to navigate around them.



Maps

Where maps are available, they are generally quite unreliable in the jungle and you are likely to encounter unmarked features. Use them only as a general guide. However do get familiar with features such as contours, rivers, cliffs, villages and swamps.

Compass

Using a compass is relatively straightforward. The compass is a simple tool to tell you which way you are going and which way to go.

Holding the compass flat, rotate yourself and the compass body until the desired bearing is in line with the sighting wire. Sight along the wire to an object and make your way to it.

This takes practice, get familiar with your compass and keep at it until you are confident that you can follow a bearing.

Section Three - Emergencies

Always stay calm and consider your options before acting whatever the situation, take care not to make things worse or endanger yourself or others.

> Be aware of the international distress signal;
> Six short blasts on a whistle every minute. The response is three long blasts.
> Keep signalling so rescuers can locate you.

Lost Procedure

Most lost situations are resolved quickly and easily and are probably never owned up to but some have had disastrous outcomes.

The first thing you need to do is to recognise that you are lost, if you are not sure where you are, you are lost it is as simple as that.

It is of utmost importance that you stop where you are as a first step, blow your whistle immediately to see if you are close to other people. If you move from here you seriously reduce your chances of getting found. This is your only known reference point and is known as **point A.** You should mark this place very clearly for yourself and for searchers.

Self Rescue procedure

There are several ways to perform a self-rescue but we recommend two;

Back Track

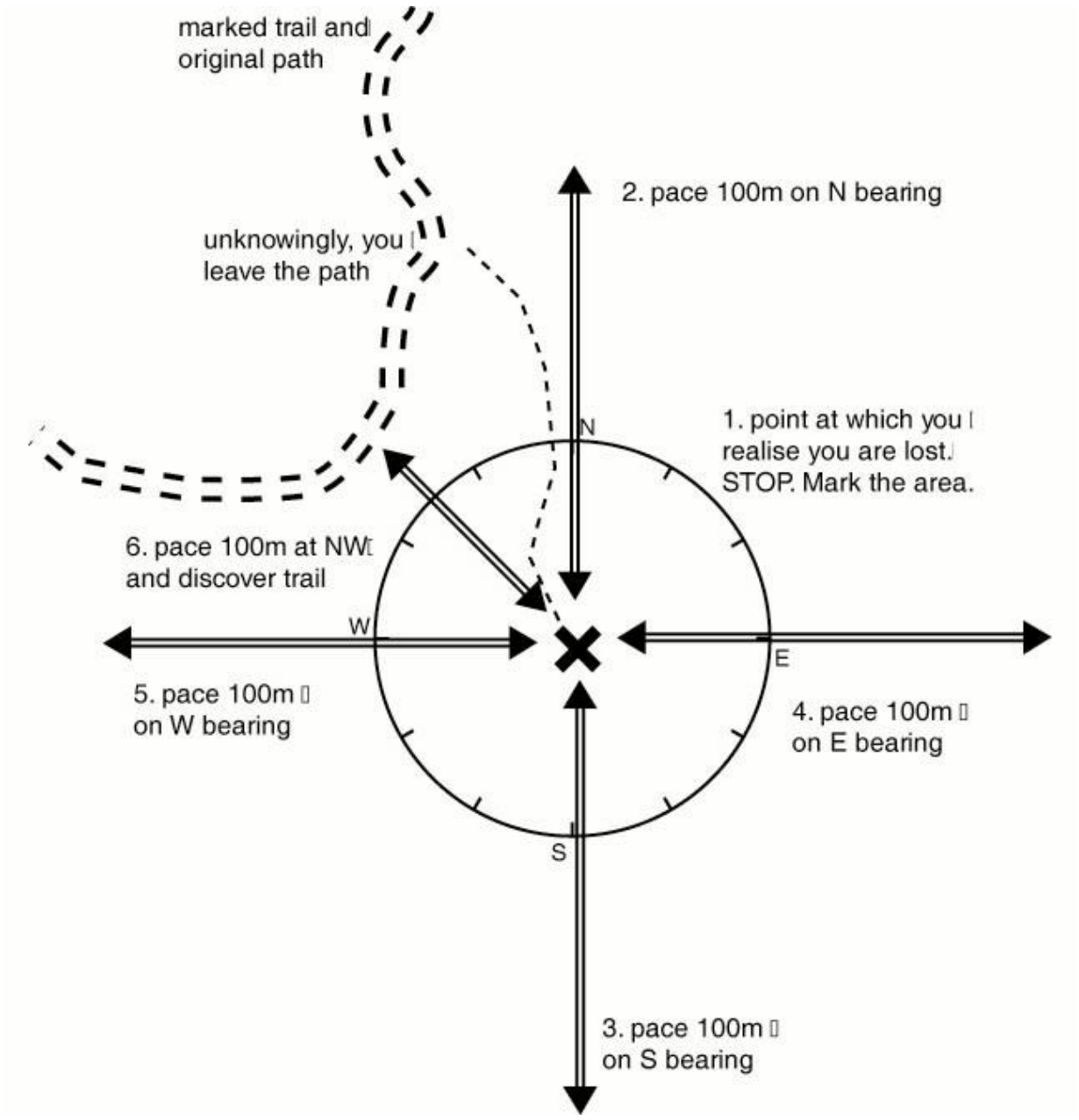
Start with ensuring that you have left sufficient evidence to searchers coming from any direction

Once you are sure that you have left enough evidence you can start to attempt to self-rescue. The simplest way of doing this is to try to remember the way you came and back track. When you back track you need to take a bearing on your compass, write it down and walk for 100-200 metres on that bearing all the while stamping down and marking a big trail that you can easily retrace and your rescuers can find.

Fan method

This is used when your last known position is fairly certain but it is too difficult to work out the direction you may have taken. Use obvious bearings to keep the procedure simple, i.e. North, South, East, West, then NW, SW, etc. If you find no evidence of a trail or your route in, retrace back to point A, take another bearing and do the same. Taking notes at this stage is very important, as it is easy to become confused.

You can keep repeating this, all the way round the compass, all the while making notes about where the rivers and hills are and looking for the features of **survival priorities** should you decide that it's time to prepare for a night out.
As time goes on you should go further and further from your start point (point A). IE go back to the first bearing you took and extend your cutting by another 100-200m.
If you think that there is a road or a village in one direction you can leave a note at point A and follow your compass in that direction as the most obvious start bearing.



Remember-

- LEAVE EVIDENCE
- SIGNAL CONSTANTLY
- BE CALM
- CONSIDER SURVIVAL PRIORITIES

SURVIVAL

There are four priorities to ensure physical survival in the jungle and so many ways to obtain the basics that we are spoiled for choice. The jungle provides adequately for our needs, we just need to learn how to extract them.

WATER SHELTER FIRE FOOD

Water is the most immediate and important need, especially in a hot country. You simply cannot go without water for more than two days.

Shelter will afford comfort and respite from the elements keeping us rested and able to cope.

Fire provides water purification, cooking, comfort warmth and signalling.

Food is the least important but essential to survival scenarios of more than a few days.

WATER

Where was the last river or water source that you saw?
Downhill generally leads to water as do animal tracks and dried up river beds.
Collect water from solar stills, dew collection, rain catchers, tree moisture collectors, water vines, bamboo.
Remember to purify all drinking water and if it is murky you will need to filter it first.

PURIFYING
Boiling water for five minutes will eliminate all micro organisms.
Use iodine or chlorine tablets (puritabs) if you have them.

FILTERING
Use clothing, charcoal, sand & gravel or leave a container to settle and decant the clear water from the sediment at the bottom.

SHELTER

If you think that you may be staying out even for one night, you have to start constructing a shelter well before dark. Start by finding a suitable site, near to water but out of the flood area and away from animal tracks.

Practice lashing and shelter building whenever you can, the skill is very useful.

The longer you are out for the better your shelter can be, you can always improve on what you have built.

FIRE

Lighting fires is something that you should practice as often as possible it is a life-saving skill and cannot be underestimated. Always carry a fire lighting kit with you and don't be tempted to use the lighter from it for cigarettes or to lend out.
The psychological benefits of fire alone make it an essential priority so consider keeping tinder tucked in your clothes or in a plastic bag to keep it dry.

FOOD

We can survive for a couple of weeks without food if we conserve energy but it is best to try to obtain nutrition whilst you have the energy.

Fish are your best option in the jungles of Borneo, there are many rivers and they are all full of fish, you can use a trap, a line or a net to catch them.

Vegetables do exist in the jungle but are difficult to identify. Get locals to show you plants that you can eat and memorise them – consider the taste test.

Mushrooms are potentially fatal and you should not even consider them unless you are 100% positive of what you are eating.

Fruit can be a good source of food but like vegetables are sometimes very toxic. If the monkeys are eating them it does **not** mean that they are safe for humans – consider the taste test

Animals can be caught with skill and well constructed traps but can be hard to kill, butcher and cook correctly.

CONCLUSION

Survival is 90% mind set and 10% field skills, there is plenty to keep you alive in the jungle and even comfortable, many people live in the jungles without any outside influence and do so very successfully too.

Don't panic!

CULTURE

It is prudent to be aware of the cultures of the places we visit and to show respect for the customs, traditions and beliefs of the people who live there.

Asian people are generally extremely polite, friendly and very rarely get angry. Confrontation almost never happens as all party's 'lose face' and these things are never forgotten.
They are also usually late, this is normal and not considered rude, you will have to learn the term 'rubber time'!

Always try to learn some of the local language and refer to staff by name.
Avoid shouting in the forest, this is considered very bad and local people often believe that it angers the jungle spirits.
Do not call anyone by name unless they are close by.
Take care not to mock the local belief in jungle spirits, some of the beliefs are deeply embedded in local culture and it can be very insulting.
Always offer to share your food with your staff.
Do not pass food, money or gifts with your left hand.

Please try not to tempt the local people with your expensive equipment, cameras or ipods, put them away when you are not using them. Their yearly wage is probably less than a months wage for most of us and they always see us as we are; privileged and comparatively rich.

The more you put into interactions with local people the more you will get out of them in terms of cooperation and lasting friendships.