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NOTES ON MEDICAL ASPECTS OF EXPEDITIONS WITH YOUNG PEOPLE

The Experiences of an Expedition Doctor

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FORWORD

This is not a handbook of expedition medicine - there are plenty of those. Rather it is a series of thoughts and jottings based on many years of travel with young people in some of the most beautiful but potentially hostile areas of the World. They are not comprehensive but are points which I have found important to keep in mind.

The material reflects my own experiences, particularly in desert and savanna regions and in the mountains, but many of the same principles apply to other areas, such as the polar and rainforest parts of the World.

Because of his special role the Doctor is in a slightly different position from other leaders and their day-to-day concerns of running the expedition. He is able to some extent to stand back and have a broad view as events unfold and can thus be of great help to the Chief Leader who can sometimes be too close to the action to see the overall picture. For this reason some observations are included which may not at first seem relevant to the role of the Doctor; but all aspects and events may have medical consequences and impinge on the success of the expedition.

There is some repetition in these notes as they cover overlapping aspects of the medical considerations of an expedition.

Throughout these notes the use of the male gender is shorthand for both, and an Expedition Medical Officer might be a highly-trained paramedic.

A.INTRODUCTION

A1. THE ROLE OF THE EXPEDITION DOCTOR

During the expedition the Doctor should support the leader and ensure his authority is not compromised. He should always try to keep his finger on the pulse of the expedition and try to forestall any problems that he thinks might arise. He should ensure that all channels of communication are always open and be seen to act in a caring and sensible way and he should encourage team building in the group by his own actions and attitude. He should therefore inform the expedition leader of any medical problem that may affect the expedition as a whole.

Remember that when looking after young people you should act as a responsible and caring parent and look after not only their physical illnesses but also their emotional welfare. You have a legal duty in law to act in this manner.

Medical support is essential and a doctor (or paramedic) is necessary when travelling to remote areas and the support of an experienced nurse is invaluable. If an expedition is split into several semi-independent parties communication with the expedition doctor/paramedic is necessary and a nurse with each group should be considered.

The Doctor must be available for anyone on the expedition at any time to listen and offer sensible advice. He should act professionally throughout and everyone should understand from the start that he will maintain a strict code of confidentiality, conveying information to

the expedition leader as anonymously as possible and only when the urgent need of the expedition so dictates.

He should remember that not only is he responsible for the welfare of the members but also of the leaders who, being older, may have different medical problems - for example hypertension or heart disease.

He may also be asked to give advice to associate members of the expedition, for example game wardens and guides and local people, and this may involve much of his time.

It is important for the doctor to meet the expedition leader and his leader team to assess their attitude to safety and expedition management before the expedition leaves, to ensure it conforms to his own.

Everyone must take the expedition seriously and not view it as a holiday or jaunt; it should be planned carefully and thoughtfully.

He should meet the parents if possible and discuss with them any concerns they may have before the expedition leaves and be available to be contacted by telephone to answer any queries, especially if he has not been able to meet them at the planning stage.

He must be fully involved in the risk assessment process, assessing the main risks the expedition may face both from personal and environmental points of view and ensure the members are carefully informed of these and how to prevent or deal with them.

He should assess the worst possibility, such as serious injury or disease, and have a plan to try and deal with it. Planning should include research into the availability and safety of local services - hospitals, clinics, blood supplies and so on. Emergency evacuation must always be at the back of his mind - the availability of and communication with medical air rescue - especially in remote areas where landing may be a problem.

The advent of satellite telephone communication has significantly helped in this respect. Also, it has helped when there are several groups within the same area; for if trouble arises within one group help and advice can then be offered even though the doctor is elsewhere.

He should organise a medical questionnaire and when completed, interview the members and assess them not only in respect of any organic disease but also to assess the personality of each member. Psychological assessment goes a long way to preventing problems that may arise on the expedition.

He should be responsible for organising a comprehensive immunisation programme and oversee a system to ensure that all expedition members actually undertake it.

He must organise medical kits, both the main medical kit and team kits as appropriate and advise about their personal medical kits.

In the pre-expedition training or in the training stages at the beginning of the expedition, he should ensure that all expedition members have a basic knowledge of resuscitation methods, instruction as to how they may be carried out: for example maintaining an airway and cardio-pulmonary resuscitation. Instruct on the difference between venous and arterial bleeding and how to deal with both and ensure that they know how to deal with an unconscious patient.

The leader in charge of a group must do everything to promote team spirit and bonding within the group -

the team should function as a single unit as this may well see it through times of difficulty
effective communication is essential
there is no place for a breakaway mini-group

the sensible enforcement of discipline
the establishment of consideration and good manners within the group

The expedition doctor should be actively involved in all of these matters

Once the Doctor (or Leader) has made a decision he should stick to it, or if it is to be changed make sure that all members are aware of this and the reasoning behind the change.

The Doctor should be available to advise if necessary on any problems that may arise after the expedition has ended.

He should produce a medical report to the expedition leader at the end of the expedition.

If a tragedy happens and he finds himself in a coroner's inquest, he must be able to show that he took every precaution to avoid such an incident. He may well have to face the parents of a fatality and must be in a position to justify to them the events that took place, precautions taken to try to prevent it, and the actions taken following the tragedy.

REMEMBER THAT COURAGE AND STRENGTH ARE NOUGHT WITHOUT PRUDENCE AND THAT MOMENTARY NEGLIGENCE MAY DESTROY THE HAPPINESS OF A LIFE TIME. DO NOTHING IN HASTE, LOOK WELL TO EACH STEP AND FROM THE BEGINNING THINK WHAT MAY BE THE END.

EDWARD WHIMPER

A2. DISCIPLINE

The corner stone of expedition medicine is discipline:

1 discipline in wearing the correct clothing for the environment you find yourself

2 discipline in the preparation, serving and disposal of food

3 discipline in camp management

4 discipline in general behaviour

Discipline as regards the expedition as a whole comes from one source and that is the expedition leader. The Expedition Doctor should be on the look-out for any attempt to usurp power whether it be another leader or a junior member. All members should be left in no doubt as to the importance of the significance of maintaining discipline and great emphasis should be laid on self-responsibility before the expedition leaves the country.

The expedition may have devised a CODE OF BEHAVIOUR which members are required to sign the expedition doctor should have an important input into such a code.

Emotional attachments may occur between two members of the team and this can lead to serious problems and put the group at risk. The Doctor, and others leaders, would be wise to remember that they are dealing with adolescents, some of whom may be sexually active, as well as with adult leaders. A pair may become isolated from the group and resentment may build amongst the others. It interferes with the bonding and team spirit within the team and may lead to a breakdown of discipline. It must be explained before leaving home that this will not be allowed to happen and that if the problem does arise it must be kept under control and resumed once they arrive back home, if they both still wish. The leaders must be prepared for rapid and firm intervention should this become necessary. The doctor may be asked to prescribe the morning after pill; this is clearly the result of totally unacceptable behaviour - but the doctor needs to keep this possibility in mind.

It is advisable that the leaders and members pitch tents close together when camping, to prevent any tent swapping at night.

Because of dangers relating to accusations of sexual abuse, leaders should not share tents with junior members except in an emergency [when at least two other members, one a leader, might share].

Particularly in the developing world, it may be prudent to remind members of the dangers of sexually transmitted diseases if it is expected that the expedition will be in close contact with members of the local population.

A3. PSYCHOLOGICAL AND EMOTIONAL ASPECTS OF EXPEDITION MEDICINE

As the day of departure looms nearer you may well feel apprehensive about your decision to go. You may worry about the risks you may be exposed to and what may happen to the loved ones you leave behind; and you may worry about how well you will get on with the other expedition members. This is normal and will soon pass once the expedition starts.

Expeditions are exciting events, a new environment is seen, problems of developing world countries including poverty and disease are witnessed, and remote and potentially hostile regions visited. Most members adjust with little trouble although some disorientation on arrival is inevitable,

but some members feel uneasy and apprehensive and some home-sick though most settle down quite quickly. After about three or four days some members of the expedition may be overcome by feelings of intense tiredness - they may feel they can go to sleep standing up. This can also occur at any time on the expedition. It is often accompanied by nausea and a headache and feeling ill and thus may mimic a viral infection, but it is actually a case of intense fatigue. It is the body telling you that it needs a rest, and the status quo may be returned to by an early night and a long sleep.

Most members may not have travelled as far and not for such an extended period of time, and after about three weeks may feel it is time to return home This should be recognised if they become agitated but it soon passes given time and understanding. On a four or five week expedition the third week or so is also a time when spirits may be generally low: the initial excitements have worn off and the end is not yet in sight. The medical team needs to be especially watchful at about this stage. Sometimes panic attacks and hyperventilation occur and the unfortunate member finds it increasingly difficult to breath and breathes even faster which compounds the whole problem. They may develop spasm of the hands and fingers - and they continue to panic. All can be brought under control by re-breathing into a paper bag, an explanation of why it has happened and a sympathetic and understanding ear.

Depression may be a problem on occasions, especially when there has been a previous or strong family history, and remember that mefloquine may have a part to play here. Again it is important that the doctor or nurse is available for help and counselling. This often takes a fair amount of time and should be treated with the significance it deserves. Most of our deep emotions are usually kept under control but in an expedition environment they sometime erupt without much warning. The member becomes agitated, upset and clearly is struggling with the problem. It may be related to parental separation, death of a relative, or bullying in the past. This sudden release of emotion is referred to as 'abreaction' by the medical profession. Again, this takes time and understanding but can be usually brought under control.

When members return home it may be difficult for some of them to get back to what was normal. Relatives may seem indifferent to the tales the returning traveller has to tell as they are usually just relieved to have them back at home safely and in one piece. This can lead to frustration and it is as well to prepare them for this possibility. Travellers may be keen to return to help, having seen scenes of extreme poverty and disease.

Plans made beforehand may be changed but my advice is to stay calm and allow emotions to settle down.

B. PREPARATION.

B1. BEFORE YOU LEAVE

The plans you make before you leave these shores go a long way to ensuring your safe return and they should be carried out thoughtfully and carefully.

Make sure that all members have adequate and comprehensive medical insurance. Check evacuation and search and rescue insurance and note the higher medical costs in countries such as the USA.

B2. MEDICAL QUESTIONNAIRE AND INTERVIEW

All members should complete a medical questionnaire. This is a confidential document and may be completed by the expedition doctor or the member's GP - the later may charge for this service.

All members should be interviewed by the expedition doctor and he must assume that the illness of one member may well affect the group as a whole when making his judgement as to whether the member should join the expedition. Always take careful note of members who suffer from diabetes, especially when newly diagnosed. Also of members who may have a history of epileptic fits, especially when newly diagnosed. Migraine should also be recorded as potential problem.

Look out for orthopaedic problems of the lower limbs, especially on an expedition where trekking or climbing is part of the programme. Such problems may become aggravated - and remember the group can only travel at the pace of the slowest member. Asthma may become a problem so ensure that the member brings an adequate supply of inhalers. Be on the lookout for a history of depression which in my experience is not uncommon in young people and may recur during the expedition.

The Doctor should also realise that a member of the expedition might not give an accurate medical history and omit some illness (for example renal problems which may rear their head in the form of kidney stones in desert travel when dehydration is a contributing factor). The excuse given is that the member thought he might not be able to go if this information was given. This should be dealt with sympathetically.

Toothache is a miserable and painful problem - so a trip to the dentist should be part of pre-expedition requirements.

B3. PARENTS

Try to ensure that you speak to the parents of young members before you depart. This is invaluable: they have a chance to assess you, questions may be answered and advice given on variety of subjects.

Also discuss with parents the problems that may occur when the intrepid traveller returns (see Section 3).

A meeting is by far the best way of building knowledge and mutual confidence but if this is impossible, ensure that parents have addresses and phone numbers so that they can contact you before and after the expedition.

B4. INITIAL OBSERVATIONS

It is an interesting exercise to sit and watch the various personalities that present themselves and careful observation often goes a long way to preventing problems on the expedition. Often psychological problems cause far more work for the expedition doctor than organic disease.

1 Look out for the anxious member who may be a candidate for hyperventilation when under stress for example at customs posts.

2 Try to spot the loner who may find it difficult to fit into the group and may be at risk from bullying. Bullying is in my experience not common but leaders should be on the lookout for this problem.

3 There will always be one member who apparently does not listen to advice no matter how many times it is given he needs a careful eye on him during the whole expedition. Unfortunately arrogance may occasionally play a part in this attitude. It must be dealt with decisively and the member must be left in no doubt about unacceptable behaviour.

4 Try to spot the camp cat who tends to doze by the camp fire and resents being disturbed and is basically lazy - he may need some gentle encouragement to become involved.

5 Also the prominent (sometimes 'macho') member who may set high standards of activity or popularity before departure and not be able to maintain them on the expedition, thus becoming despondent...

6 Look out for the over-enthusiastic leader who may be more interested in his own personal achievements and does not take into account the ability of the group as a whole.

7 Beware the leader who tries to please everyone and tends to lose discipline within the group.

B5. FEMININE MATTERS

It is a good plan for the female members of the expedition to have a separate briefing session with the medical team during a pre-expedition training session.

Periods: the extra stresses of an expedition may cause these to become lighter, irregular, or stop altogether, and female members should be pre-warned about this.

Urinary Tract Infections and Thrush: good personal hygiene, loose fitting cloth underwear and a good fluid intake will help to prevent these problems. The medical kit should, however, include suitable anti-biotics (such as Trimethoprim) and Diflucan capsules.

Members taking the **contraceptive pill** should continue as normal but avoid the withdrawal bleed by continuous therapy. If any wish to start the pill beforehand, start about 3-4 months before to establish a regular cycle. Do not advise them to take hormonal tablets to delay menstruation. In my experience no matter what you do there is a possibility of irregular or break through bleeding – so advise them to bring extra sanitary protection. Sealable small plastic bags are a good idea if there is a problem with disposal. Remind female members that use of antibiotics will affect the use of the contraceptive pill and lessen its effects as a form of birth control.

B6. PERSONAL MEDICAL KITS

Members are responsible for taking and looking after their own personal medication**.**

A Personal Medical Kit should include:

any prescription drugs you are already taking, and an ample supply to ensure you do not run out
extra inhalers for asthma use
anti-malarial therapy if relevant
paracetamol tablets for mild to moderate pain
Imodium for diarrhoea (but only use in an emergency situation)
aloe vera lotion for sunburn and itchy rashes
antiseptic cream or tea tree oil for cuts and grazes
a few sachets of electrolyte salt replacement sachets e.g. dioralyte
travel sickness tablets if required
selection of plasters including some form of blister treatment pack (e.g. Compeed/Second Skin)
anti-fungal cream

N.B. Members should be warned against offering any of their own medicines (such as pain killers) to others in case of allergic reactions.

B7. IMMUNISATIONS

Immunisations should be carried out in plenty of time (6-8 weeks) before departure and the expedition doctor should prepare and circulate a suitable programme. Members should contact their own GP who will almost certainly run a travel clinic. The expedition doctor can only advise - the ultimate responsibility is the member's own GP.

MASTA provides an excellent and comprehensive account of the immunisations required but also details about relevant local medical problems such as AIDS, malaria and general security problems. The telephone number of the MASTA Travel clinic is 08702416843. If you find MASTA inappropriate try fitfortravel.nhs.uk

Remember there has to be a gap of about two weeks between giving a live attenuated vaccine - for example yellow fever - and a killed vaccine - for example typhoid . You will need a certificate to prove you have had a **yellow fever** vaccination. There is a charge for this and it can only be given at designated centres. Most GP's now charge for travel immunisation programmes and charges can vary considerably between different parts of the country.

Rabies is uncommon but deadly; the rabies vaccine is the most expensive, each ampoule costing in the region of £25, and three injections will be needed. It is imperative if rabies is a risk that this is done. The expedition doctor should remember to bring rabies vaccine with him to give post exposure protection.

Cholera vaccine is now regarded as being ineffective. If expedition members have had regular **tetanus** vaccine (about five doses) they will not need further protection. If in doubt they should check with their GP.

Hepatitis A protection can be afforded by intramuscular immunoglobulin, but this lasts only about three months. For the regular traveller a vaccine is now available which lasts much longer - up to ten years - and may be combined with **hepatitis B**.

Immunisations are important but no vaccine gives 100 per cent protection and it is important not to drop your guard.

More people die from drowning, road traffic accidents and alcohol abuse than from disease protection afforded by immunisations.

The doctor has the right to prevent a member participating if he is not willing to comply with the immunisation programme for whatever reason - for example reliance on herbal medicine.

Younger members especially may need vocal reminders at breakfast to take their prophylactics.

MALARIA

Malaria is a major world killer and until an effective vaccine is found malaria will always be a problem for the expedition doctor and the traveller. With increase in air travel malaria is becoming an increasing problem for the British GP.

If you have returned from an area where malaria is endemic and develop flu-like symptoms within a year of returning you have malaria until proved otherwise. There are several horror stories in regard to neglect in this aspect. Read about the habits of the female mosquito which bites from dusk to dawn and transmits malaria.

Try to deny the mosquito access to the skin:

Wear the correct clothing in the evening - long sleeves and trousers
Tuck your socks into your trousers to prevent bites around the ankle
Use mosquito nets impregnated with DEET
Use various creams and impregnated bands to deter the mosquito
Spray rooms in which you are going to sleep with insecticide

No prophylaxis is totally effective and it only takes one bite .....

The emergence of resistant strains of parasites is a major problem and the treatment regime often changes.

Possible side effects should also be discussed with your medical adviser.

It is estimated that in the region of 60 per cent of travellers do not complete their chemoprophylactic course. Start taking it as directed before you leave, obviously while you are there, and then for the correct length of time on return.

Consult your GP or travel nurse regarding the correct form of chemo-prophylaxis to be taken.

Mefloquine (Larium) is probably the most effective drug but is not without its problems. It has significant side effects which are neuro-psychiatric problems. Some authorities believe that some of these symptoms may arise anyway and not be related to the drug. Side effects are in the region of 1:50. Start taking mefloquine 3 weeks before departure as side effects soon appear and you may then be able to change to another drug regime. Stress to all members that they are responsible for taking their own course of treatment and, more important, finishing it. The expedition doctor should remember to bring treatment for breakthrough malaria.

Malarone is popular at the moment, but because of drug resistance I have no doubt that this will soon change as other forms of treatment have in the past. There are cases when hospital treatment may be required but this is unusual. Members taking doxycycline to prevent malaria may well have skin problems with exposure to sunshine.

B8. AIR TRAVEL

This should pose little if any trouble for young people.

Arrive in plenty of time as airport security is now high when checking in. Make sure all the relevant documents are to hand (for example yellow fever forms) at your destination.

Try to travel and arrive at your destination at the time you normally go to bed. Set your watch to correspond to the local time of your destination - this helps you to adjust to the time difference.

Be on the look-out for the anxious members and hyperventilation.

Avoidance of stress and possible accidents will be helped if the following non-medical matters are adhered to.

Disciple at airports is important especially in sensitive countries, for example taking photographs may be a very serious offence.

Make sure the group stays together. Try to ensure your group is booked in as a whole but this may not be possible. If not, arrange for members to go through passport control to the departure lounge and make a camp there. Two members should wait by passport control to direct others to where the group has settled and wait until the last member has arrived. Once there all the day sacks can be kept an eye on and members may wish to go shopping and look around but must be given strict instructions as when to return to board the aircraft. On returning home separation of the group is inevitable after leaving the aircraft but I suggest all should meet at the baggage reclaim point and when all the members and their baggage have been accounted for it is safe to move on to the next part of the journey home.

When you arrive at your destination watch out for disorientation with members and make allowances for it.

ON THE FLIGHT

Boredom is often the commonest problem on long haul flights and in departure lounges and patience (and a good book) are needed.

Make sure all members are aware of deep vein thrombosis. Elastic support stockings are thought to be beneficial.

Dehydration can be a problem in pressurised cabins so make sure an adequate fluid intake is maintained. Drink flat rather than fizzy drinks and avoid alcohol consumption.

Emphasise the importance of lower limb exercises and adequate fluid intake.

Aspirin is thought to be of doubtful benefit.

B9. PERMISSIONS

Ensure that you have a Home Office licence to carry any controlled drugs and ensure that you have any necessary permissions to import such drugs into the host country. Ensure that you have relevant insurance cover to treat all expedition members and members and other people in the host country.

C. IN THE FIELD

C1. GENERAL MEDICAL ADVICE TO EXPEDITION MEMBERS

Avoid contact with local animals, especially dogs, where bites and rabies may be a possibility. Dogs in remote areas are not the friendly ones we associate with home: they are usually aggressive and kept for security.

Do not bathe in freshwater where schistosomiasis may be a problem.

Do not handle hides, skin or hair or their products because of the risk of anthrax spores. For the same reason never sleep directly on the floor where animals have been. Look for animal droppings.

Leave your mobile phone at home. If your parents need to be contacted it will be arranged by the leader team.

In general go to bed early, keep the noise level down as you (or some other expedition members) may well have an early start and it is selfish to deprive others of sleep.

Other concerns which although not strictly medical are important to the Doctor as they can affect the well-being of individual members and the group. They include the following points.

Do not take photographs of local people without permission.

Treat all religious places with due respect.

Do not take photographs in sensitive areas -airports, military installations and religious shrines.

Conform to and respect the local traditions in relation to dress and behaviour.

Beware of pick-pockets in crowded areas, for example in markets, and keep your money safe – use a money belt or zipped pocket. Do not count large amounts of money in a public place – for example after leaving a bank.

Without a passport you cannot leave the country. Consider collecting them all together on arrival and arrange for them to be kept in a place of safety.

The idea of bringing banned substances on an expedition is totally unacceptable. If caught you may well be subjected to the laws of the country, which may be severe indeed and the whole expedition will suffer in many ways.

Do not try to smuggle any object home banned by the country you visit (for example the skins of animals or archaeological artefacts) check the list the customs authorities provide.

TRAVEL IN THE FIELD

Leaders when driving mini-buses should exercise great care and attention to their driving. When driving in a convoy the group should stay together it is not a race and a sensible attitude to speed and road conditions must be adhered to. You may well need an International driving licence.

When being in trucks owned by a reputable firm it is a good idea to have a leader in the cab with the company driver to ensure safe driving standards are maintained.

When travelling in a truck or other vehicle do not play with open bladed knives for it only takes sudden braking, or the truck hits a bump, for trouble to arise. Self-inflicted stab wounds of the anterior aspect of the thigh are not a good idea.

C2. MEDICAL ASPECTS OF CAMP MANAGEMENT

This is a time when the expedition doctor must be seen to be available if there are any problems.

Members must be confident that all matters will be dealt with confidentially.

This is an interesting time to assess the various personalities within the group and to watch out for problems.

Consider carefully the problems of food storage (animals and ants) and waste disposal. In some areas such as North American National Parks, there are specific regulations concerning the storage of food (the bear problem) and disposal of waste.

SELECTING THE SITE

There are medical considerations involved in selecting a safe site. For example avoid obvious hazards such as cliff faces and try to ensure the ground is reasonably level. Look for natural shade and if there is none erect a shade sheet.

If wood is needed for cooking fires ensure that some is available but beware of snakes which spend time in trees and woodpiles and also that wasps and bees may make nests there.

Never camp in a dried out river bed (lugger/wadi/oued) as there have been many deaths from flash floods. The heavy rain may fall many miles away but the lugger may suddenly become a raging torrent with trees, boulders and dead animals being swept along.

If camping near a lugger, or high up on its bank, look out for standing pools of water. It is here that game, including larger game like lions, may come to drink and look for a meal!

Do not camp near animal tracks - for example hippo tracks near rivers. Large animals will go through tents rather than round them.

To prevent injuries and parasites no-one may walk around bare-footed.

Try to clear the area of dead leaves and branches which may hide scorpions and be on the lookout for snakes.

Avoid animal droppings as these may carry anthrax.

AT NIGHT

Ensure all sleep in the same area with no one wandering off to sleep apart from the group.

All members should either sleep on a camp bed or ground sheet and not directly on the ground.

Do not leave items of clothing or sleeping bags on the floor where spiders or scorpions may crawl in or under, and for a similar reason keep your boots off the floor when you go to bed.

It is a good idea to take an empty pillow case with you to put your clothes in at night and then you can use it as a pillow.

Make sure your torch is at hand at night - do this before dark!

No-one must ever leave the confines of the camp at night especially if there is a danger of predatory animals.

It is in everybody's interests to make sure that you all get a good night's sleep to make the best of the days to come. Observe any curfew hours.

HYGIENE AND COOKING

Under no circumstances should any cooking be allowed inside tents. It is especially dangerous with gas cylinders, because of the risk of explosion and fire. This is especially a risk when the gas cylinder runs out and the gas cylinder is changed and residual gas escapes within the confines of the tent and the new cylinder ignited. Some modern stoves have overcome this problem but the risks of fire, as well as of scalding, remain.

Similarly a Trangia must not be filled with meths unless the burner unit is cold - if you can remove it with your fingers it should be cool enough. A second burner for each stove removes this problem. The danger comes from exploding vapour.

A common cause of scalds is when a cooking pot is knocked over so keep all cooking away from tents.

Check all water supplies for purity and use filters, boiling or purifiers as necessary. Water supplies must come from upstream of latrines.

Dig a toilet hole away from the camping area - a couple of feet deep - behind a bush for some privacy. Put a spade by it with the toilet roll on the handle - if you can see it, the loo is free!

Cover the results including the toilet paper with some soil, and ensure that proper post-toilet ablution facilities are available.

It is also important to wash mess tins properly and dispose food remnants safely away from the camp site.

Soak away areas should be constructed for disposal of used water.

I suggest the three-bucket method for washing-up:

1 The first bucket is empty and into it the food scraps are scraped and the dirty water is poured.

2 The second bucket has water with Dettol and a mug at hand to clean the mess tin/bowl and cutlery. Using the mug, take water from this second bucket and wash it over the first bucket so that the water in the second bucket always remains clean.

3 Then with another mug by the third bucket take clean water and rinse it over the first bucket again ensuring the water in the third bucket is again left clean.

The key is that the plates are not put into the bowls.

It may be a good idea to work in pairs to do this and for the operation to be supervised by a leader.

Dispose of the food products in a deep hole well away from the camp in case animals come in the night looking for food. Burning the rubbish once in the hole may be an acceptable practice in the expedition area, but this needs to be checked.

After cooking and cleaning the camp site must be left tidy for a tidy camp is a safe camp.

Good personal hygiene must be encouraged by the provision of suitable facilities, including facilities for washing clothing.

FIRES

When members go looking for wood they must not go out alone but with at least three other people. If there is trouble one stays with the member in trouble and the others return to camp to report the incident. They must be especially cautious about the likelihood of snakes and scorpions being in wood piles - great care and strong gloves will help. Fires are not only used for cooking but form a social centre for the camp and in many areas are kept going at night to discourage visits from animals. Organise a rota for a night, watch changing every hour: keep the fire going and move about a bit. After cooking, the fire may be allowed to die down but enough wood should already have been collected to keep it going through the night. It is not a good idea to be fooling around by the fire and then fall into it - you may laugh once too often.

Remember when you move on the next day to clear up the area and leave it as you found it – or better.

C3. PARTICULAR PROBLEMS

GASTROENTERITIS

This is a common problem and will almost certainly raise its ugly head. It can also cause major disruption within the expedition and prevention must be taken very seriously. It may be extremely difficult to avoid despite all the precautions taken. Some form of alteration of bowel habit is inevitable

These problems tend to happen when you become lost or there is a problem within the group that significantly slows its progress down. It may also happen when members do not obey the rules and discipline in protection from the sun is neglected.

Even in arctic areas dehydration can be a problem and all expedition members should be encouraged to drink more than their normal intake.

BLISTERS

A blister may imply a relatively insignificant injury but I give the prevention and treatment of them the highest priority. When discomfort and reddening occur apply a protective dressing sooner rather than later. There are several on the market and your local chemist will be able to give advice. If fluid starts to collect in the blister carefully release it using a sterile needle and apply a firm dressing again. The problem is that these tend to slip when walking but the application of gaffe tape goes a long way towards preventing this. If the symptoms are improving they are better left alone but you will need to inspect them at some time to make sure they are not becoming infected.

SNAKES

Snakes are some of the most feared animals yet they are placid and gentle creatures and the vast majority will not attack unless provoked. I suggest if you see one you leave it alone and admire it from a safe distance. Read about snakes and their habits. The first snakes were the elapids - the modern equivalents are the cobra, mamba and the krait. These are snakes that have back fangs and employed neurotoxin venom to kill their prey. Later in evolution as mammals, emerged the vipers appeared and a different approach was needed to kill larger and faster animals - these had front hinged fangs and used a haematosis and catatonic venom to kill and digest their prey. They are cold blooded and struggle with temperature regulation, so you may meet them on rocks early in the day warming up and on roads at night for the same reason. During the heat of the day they will seek the shade. If they feel you coming through vibrations in the ground they will slither away. The other way they escape detection is by camouflage - so tread carefully and use your common sense. Do not panic and run as this may frighten the snake into attack.

Always wear ankle length boots, never put your hand where you cannot see (for example under logs when you are collecting wood) never leave the camp at night when snakes are most active. Look in showers and toilets carefully during the day as they may be resting there out of the sun.

If you are unfortunate to be bitten by a snake the odds are nothing untoward may happen, but if you tease it or prod it with a stick it will have time to store more venom and the results may be different. If you see a snake and are within 6-8 feet stay still as snakes strike at movement – keep calm and allow it to slither away. If someone is bitten reassurance is most important: serious poisoning is rare in humans especially if adequate medical treatment is received. Apply pressure over the bite with the palm of your hand and apply a crepe bandage over the limb. If the bite was on the hand apply the bandage from the shoulder wrapped around the arm down to the hand making sure it is not too tight. Ensure that the bitten limb is kept still as movement spreads the venom. Do **not** incise the bite or suck it but carry the patient back to camp and seek medical and hospital treatment as soon as possible. Anti-venom should only be used in hospital and only when there are clinical signs of poisoning. In neuron-toxic poisoning this includes sagging of the eye-lids, difficulty in swallowing and breathing. In haematosis poisoning abnormal bleeding into the skin, bleeding of the gums and internal bleeding.

I would advise an expedition doctor **not** to carry anti-venom, it is very difficult to obtain, has to be kept at a specific low temperature and is very expensive. Rather lay great emphasis on discipline in the aspect of avoiding the problem. Anti-venom wrongly used can be more dangerous than the snake bite and there is a tendency now to treat the symptoms of the poisoning and not to give anti-venom. Anti-venom should only be given in hospital by an experienced doctor and by intra-venous infusion.

D. TWO PARTICULAR ENVIRONMENTS

DO. MEDICAL ASPECTS OF DESERT TRAVEL

Sand is a feature in only a few deserts (only about one sixth of the Sahara is sandy) and they are usually characterised by stone or rock with scrub with some grass and trees. They provide a spectacular range of scenery: of mountains, plains and valleys and dried out river

beds. They cover more than one fifth of the land surface and are characterised by rainfall of less than 10" per year, which is seasonal and sporadic, and low humidity. Any rainfall is seasonal or sporadic. Cloudless skies ensure that 90 per cent of solar radiation hits the desert floor but the reverse happens at night when the heat is given up and temperatures can drop to freezing. Winds are often a significant feature of desert travel.

Survival in a desert depends on:
- a supply of water,
- a supply of food,
- protection from the sun,
- avoiding the sun,
- avoiding attacks from predators, both four legged and two legged.

WATER

The amount of water you require should be carefully worked out in advance with a safety amount added. In Britain you will need to drink about two litres of fluid per day to maintain your fluid balance: in desert conditions you will need to drink on average a basic minimum of five litres per day - you can lose one litre of sweat per hour. In this five litres no water is taken into account for washing or cooking - it is for drinking only. Wet wipes are used for personal hygiene. The source of water must be known - if there is any doubt sterilise it (e.g. using steritabs). Make sure you carry water in containers that have both a diaphragm cap and a screw cap and do not leak. All containers should be numbered and an accurate account of each container noted. All these facts should be kept in a water book and be the responsibility of a leader. The leader in charge should be able to give an accurate account of the water supply when asked and what has been sterilised and what has not. All the containers should be kept together and when making camp kept in a place visible to all members for security reasons. You may need to organise a water dump (which should be guarded) on the route. When water is being poured into a cooking utensil or a water bottle a funnel should be used to prevent wastage.

CLOTHING AND EQUIPMENT

The well-dressed desert traveller should wear:

1 A broad-brimmed hat to protect not only the face but neck, ears and nose, and sun-glasses or goggles to protect the eyes from the sun and sand blown by the wind.

2 A piece of towelling or Arab headscarf around the neck. This has a multitude of functions from wiping sweat of your face to protection from the wind and flies, and may be used to afford extra protection from the sun.

3 Long sleeved shirt and trousers for which the Army and Navy stores are a good and cheap source of supply.

4 Wear long trousers in the bush to prevent tics which are parasites that live on the blood of goats sheep and camels and can many problems in humans At night it is a good idea to inspect your body especially in the groins to look for them; they are easily removed by gently pulling with a pair of tweezers. Never sit on the ground where they may be lying.

5 Suitable underwear, preferably loose fitting though this is a matter of choice

6 Desert boots if possible with a proper and solid base to prevent penetrating injuries of the foot for example from acacia thorns. Suitable socks are also required but not cotton

7 Make sure your boots fit properly and be certain to wear them in before you go as blisters on the feet can significantly affect your progress and the progress of the group as a whole. Their treatment can also involve much time and effort by the medical team

Contact lenses should be left at home because of eye irritation from the lens and risk of sand particles getting under the lens as both these may cause an acute conjunctival an extremely unpleasant eye problem.

On your back carry a day sack and remember what you put in it. Two litre water bottles are mandatory together with whatever else you need - camera, binoculars or a supply of sweets

CAMEL AND OTHER TREKS

Set off on your camel trek early in the morning to avoid the heat of the sun and carefully plan the day the night before. Set off early to get the benefit of the cool of the morning, BUT do not set off before the sun has risen as people tend to trip over in the dark and lose things or get injured.

The group should stay together with no stragglers at the back and it is a good idea to follow the camels that will be carrying your supplies. A local guide leads with a senior member with him and at least two leaders in the rear. The pace should be steady - remember it is not a race. The camels will clear the area in front from snakes and you can keep a close eye on the camel train. Do not lose contact with it: this may be easier than you think. Stop about every hour or so to check on the team's progress and ensure all are wearing the correct gear and there are no problems.

Pay particular attention to feet and ensure a good fluid intake. About mid-day it often becomes extremely hot and it is time to look or a suitable camp site. When camp has been sorted collect all the water containers from the camels and put them together in a safe place.

One of the problems in desert travel concerns wild animals and snakes and this should be constantly be born in mind, especially at night. Two legged predators may also be a problem and it is not unusual to see a young farmer in charge of sheep or cattle, carrying an automatic rifle to protect his herd from neighbouring tribes or bandits.

Communication within the group is vital and at night it is a good idea for the group to be gathered together and the plans for the next day explained and discussed. The input of the members into a running Risk Assessment is always valuable. This is another opportune time for the doctor to sort out any personal or group problems and to discuss and re-enforce some relevant medical topic such as snakes or diseases endemic in the area.

D2. MOUNTAINS AND MOUNTAIN SAFETY

There is evidence that people have lived in mountainous areas for centuries but until the late 19th century mountains were viewed by the Europeans as dangerous, hostile and remote. The temperature falls with increasing altitude and produces an environment not unlike the Arctic. Not only does the temperature drop but high winds increase the danger of cold injury. The humidity is low and, together with an increase in solar radiation and wind, leads to rapid fluid loss and dehydration. Again careful preparation, selection of members and maintenance of discipline are mandatory. Protection against the cold is essential, as is a high fluid intake.

The development of mountaineering clothing and equipment has significantly reduced the risks of mountain travel and has also an increased an awareness of the risks. You must wear appropriate clothing to protect yourself from the cold, the wind and the sun: not only hats and gloves and suitable boots, but also appropriate sun glasses to protect your eyes from the sun and snow glare as snow blindness is very unpleasant

In a cold climate the peripheral circulation is shut down to conserve body heat and as it continues to fall there is an increase in muscle tone and shivering which causes a rise in body temperature.

Mountain climbers who are inadequately dressed are liable to suffer from frost bite and hypothermia. This also tends to happen when people become lost or immobilised by injury or bad weather and can develop rapidly in mild exposure if alcohol is consumed. The member may feel confused, act as though drunk, and obviously become very cold and start shivering. If there is no serious injury or frost bite, recovery is usually invariable if the patient is placed in a well-insulated sleeping bag and/or survival bag and given warm drinks. An extra source of heat from another suitable member of the expedition may also help. The body's level of carbohydrate also tends to fall and a glucose drink will help.

FROST BITE is obvious as hard white areas of skin on the extremities (toes or hands). Immersion in hot water, no hotter that the member can stand, is the standard method of treatment. If there is massive freezing of tissue a different state of affairs presents itself. The areas of skin become blackened due to tissue necrosis and these patients may need hospital and surgical treatment.

Remember you can only go as fast as the slowest member. It is advisable to check the contents of each day sack before you depart - in my experience members seem to want to take far in excess of what they actually need. As in desert travel you have to carry what you take. Plan carefully and allow for rapidly changing weather conditions.

ACUTE MOUNTAIN SICKNESS

For detailed and up-to-date information go to the YET Website (theyet.org – publications) - ***Altitude - Good Practice Guidelines to Venture Planning and Acclimatisation for Youth Expeditions).***

It has been known for years that when lowland dwellers climb high mountains (over 13,000 ft) - they may become ill. This is Acute Mountain Sickness - AMS - and starts insidiously with headache and feeling sick - the member may feel light headed or euphoric. Most cases settle, but it may progress to something much more serious. It is relieved by descending to a lower level and breathing oxygen.

There is evidence to suggest that once you have suffered from AMS you are very likely to do so again. If unchecked AMS may lead to High Altitude Pulmonary Oedema (HAPO) and High Altitude Cerebral Oedema (HACO) both of these can be rapidly fatal. In HAPO breathlessness proceeds at a rapid rate with cyanosis and respiratory distress. It needs urgent medical intervention - oxygen and diuretics. It may be associated with HACO but each may occur independently. In HACO the member, increasingly drowsy, may stagger around unable to look after himself. All of these symptoms should be actively sought by the expedition doctor, relevant treatment given, and rapid descent without delay Beware the member who goes to his tent alone stating that he is not feeling well.

As in most aspects of expedition medicine, high altitude problems can be avoided with proper planning. Control the rate of ascent so as to acclimatise slowly on your journey, and the regime of climbing high and sleeping low should be adhered to. Remember that if you

run into trouble a rescue party may be involved and this may involve a more rapid ascent with its attendant risks. Diuretics may be used here to mediate the risks. Some members will be more at risk than others: the unfit, members suffering from heart conditions, heavy smokers and those with asthma or diabetes.

To avoid all kinds of accidents all members must stay together, especially when returning to camp, when over-enthusiastic breakaway groups may emerge to try to return to camp first. The climb is not over until all members have returned safely to camp and discipline must be maintained during the whole trip

E. AND FINALLY

The expedition is not over until the members have been returned to their parents and even then the expedition doctor may be involved if there are remaining medical problems.

When you return home and have any symptoms that persist or develop, seek medical help and advice, and explain clearly where you have been and what you were doing.

USE YOUR COMMON SENSE

There are two occasions when discipline may be particularly at risk - when you first arrive due to excitement and disorientation and shortly before you leave for home when members feel the expedition is over.

Leaders should extra vigilant at these times.

Here are some final 'words of wisdom' and reminders:

Leaders when driving mini-buses should exercise great care and attention to their driving -when driving in a convoy the group should stay together - it is not a race and a sensible attitude to speed and road conditions must be adhered to - you may well need an International driving licence

When driving in trucks owned by a reputable firm it is a good idea to have a leader in the cab with the company driver to ensure safe driving standards are maintained.

When travelling in a truck or other vehicle do not play with open bladed knives. It only takes sudden braking or the truck hits a bump for trouble to arise. Self-inflicted stab wounds of the anterior aspect of the thigh are not a good idea

The leader in charge of a group must do everything to promote team spirit and bonding within the group -

- *the team should function as a single unit as this may well see you through times of difficulty - effective communication is essential*
- *there is no place for a breakaway mini-group*
- *the sensible enforcement of discipline*
- *the establishment of consideration and good manners within the group: are all to be encouraged*

The expedition doctor should be actively involved in all of these matters

Avoid contact with local animals- especially dogs - where bites and rabies may be a possibility - dogs in remote areas are not the friendly ones we associate with home - they are usually aggressive and kept for security

Do not bathe in freshwater where schistosomiasis may be a problem

Do not handle hides ,skin or hair or their products because of the risk of anthrax spores - for the same reason never sleep directly on the floor where animals have been - for example look for animal droppings

Leave your mobile phone at home - if your parents need to be contacted it will be arranged by the leader team.

In general go to bed early, keep the noise level down as you may well have an early start Do not take photographs of local people without permission Treat all religious places with due respect

Do not take photographs in sensitive areas -airports, military installations and religious shrines

Conform to and respect the local traditions in relation to dress and behaviour

Beware of pick-pockets in crowded areas - for example markets

Keep your money safe - use a money belt or zipped pocket

Do not count large amounts of money in a public place - for example after leaving a bank

Without a passport you cannot leave the country - it is a good idea that all passports are accounted for at the start of the journey- keep it in a safe place - it may be a good idea to collect them all together on arrival and ensure they are in a place of safety

The idea of bringing banned substances on an expedition is totally unacceptable

If caught you may well be subjected to the laws of the country, which may be severe indeed and the whole expedition will suffer in many ways.

Do not try to smuggle any object home banned by the country you visit - for example the skins of animals - check the list the customs authorities provide

When you return home and have any symptoms that persist or develop on your return, seek medical help and advice and explain clearly where you have been and what you were doing.

F. APPENDICES

F1. THE DOCTOR'S MEDICAL BAG

Try to obtain a well-padded medical bag to protect the contents and if possible a zip that affords access to all compartments. A rucksack will suffice but you may find that whatever you are looking for is at the bottom and the whole bag has to be unpacked. Take a sterile towel with you to place your equipment on when travelling - for example suturing or dressing wounds.

Plan the contents carefully taking into account where you are going, the number of members involved, their differing ages and how long you will be away. In a group of thirty members away for a month I usually take three or four weekly courses of broad-spectrum antibiotics and additional ciprofloxin 500 mgm capsules. I usually contact the relevant embassy before departure explaining I will be taking drugs into their country and make a list. The advice I am usually given is that if they are for personal use only there is no problem. I place the list in the medical bag but have never been asked to produce it. If I receive a written reply I also include this.

Remember that commonest things are the most common and your time will be usually spent not unlike a GP at home: viral infections, minor problems, skin rashes. Much of your time may well be spent in dealing with the psychological aspects of remote travel: depression, hyperventilation or a member who just wants to discuss a problem with you. You must also remember that you may come across more exotic medical problems such as breakthrough malaria, snake bites and attacks by wild animals or bandits. You cannot cover yourself

against everything, there could be an overturned truck or major trauma - but you should have in your mind how best you could at least try to deal with it

If there is a satellite phone available always try to have access to it and know in advance relevant numbers (local hospitals, rescue services (if any), the group's insurance company etc.).

DRUGS AND DRESSINGS

Analgesics are a matter of personal choice but I take mild, moderate and more potent analgesics including two morphine ampoules; and don't forget the sterile water for other injectable drugs.

Antibiotics are taken for Upper respiratory tract, chest, skin and urinary tract infections.

Ciprofloxacin is invaluable because of its use for a wide range of bacterial activity, but it comes into its own when dealing with severe bowel infections. Metronidazole is useful in bowel infections which do not resolve and also may be used with ampicillin in pelvic inflammatory problems - e.g. in case of appendicitis when you are days away from hospital care. You will also need to bring a selection of dressings, a minor op kit for suturing and crepe bandages of different sizes.

Eye problems are common in desert travel because of the usual attendant wind and may call for the removal of sand particles, and treatment of eye infections.

Do not forget to take the 'morning after pill'' but lay down very strict guide lines in discipline (see Section A2).

A variety of anti-fungal, steroidal and antibiotic creams will be useful. Vaginal fungal infections should be born in mind and Diflucan capsules may be useful. Cystitis is not common in my experience.

THE MOST POPULAR DRUGS USED

In survey conducted with my medical colleagues on a recent trip the most valuable drugs used

travelling in a desert environment were the following.

dioralyte (gastro-enteritis and vomiting)
moderate analgesics -usually non-steroidal analgesics (musculo-skeletal problems)
Tea tree oil (cuts, scratches and grazes) - most do not need antibiotic creams
Aloe Vera lotion (sun burn and a variety of rashes)
Imodium (for diarrhoea when travelling in a vehicle)
Ciprofloxacin (I find this invaluable and suggest you take more than you think you will need)

DRUGS FOR PEACE OF MIND

There is also a group of drugs I take for 'peace of mind'' even though their use is unlikely.

Epipen in case of acute anaphylactic reactions
Rabies vaccine for the possibility of post exposure protection
Malarone for breakthrough malaria
Intramuscular penicillin - not only as part of the minor ops kit but because of the remote possibility of meningitis
A selection of cardiac drugs for the more senior members - your own choice

Intra-venous giving set - with normal saline
Rectal diazepam
Drugs for treating Acute Mountain Sickness -steroids and diuretics

On each trip I inevitably take in excess of what I use or require but towards the end of the trip leave most of it at recognised small clinics or mission hospitals. These clinics are usually very grateful but will also appreciate medical and first aid handbooks to give to their nurses. Be careful where you leave your equipment as unfortunately in some clinics it may well be sold by more unscrupulous medical attendants. For the same reason it is wise to hand over the items in front of witnesses, perhaps at a small ceremony.

F2. MORE SERIOUS PROBLEMS I HAVE DEALT WITH

Renal colic - member
Torsion of the testicle - member
Acute appendicitis - member
Attempted suicide by a member
Alcohol abuse by member
Acute myocardial infarction in a game warden
Eight inch deep laceration of the lower leg - member fooling about
Confession of sexual abuse - member
Dealing with unconscious patients - due to toxic bacterial shock and head injury - member
Suspected fracture of cervical spine when a member fell out of a tree
Acute asthmatic attack (do not forget oral and IM steroids) - member
Sedation of hysterical young member with hyperventilation and tetany - re-breathing in a paper bag and an explanation sorts this out
Extensive burns to face and hands - gas explosion whilst cooking in tent
Heat exhaustion and collapse - member
Malaria in a local camel man
Two dying children in remote areas whose mothers would not let us take them to the nearest hospital when there was little we could do to help
Suspected case of meningitis in a remote area - my suggestion is that if you suspect it treat it
Two young members who formed an emotional relationship and wandered off together into the bush at night with total disregard of discipline and the dangers involved
Prescribing the morning after pill
Glandular fever
Stab wounds after a fight amongst camel men
Extensive scalp laceration after a guide was involved in a bottle fight
Severed radial artery in another bottle fight - local villagers
Fractured metacarpals in another fight - between two members!

Note how many of these incidents were not related to members of the expedition.

F3. REFERENCES

Oxford Handbook of Expedition and Wilderness Medicine - NEW
by Chris Johnson, Sarah Anderson, Jon Dallimore, Shane Winser, and David Warrell (eds.). A comprehensive pocket guide to expedition medicine, with practical advice for use in remote environments, and links and references to further information

Published by Oxford University Press (2015) 2nd ed. Price £30.00

OTHER REFERENCES

Dawood, Dr Richard (2002); *Travellers' Health: How to stay healthy abroad.* Oxford Comprehensive and authoritative with a detailed list of other references.

Wilson-Howarth, Dr Jane (2009): *The Essential Guide to Travel Health* (formally *Bugs, Bites and Bowels.* Cadogan Books
Excellent book to cover illnesses. Earlier editions were less bulky! Recommended to take with you.

First Aid Manual. Dorling Kindersley.
The official guide of the Red Cross, St.John Ambulance and St Andrew Ambulance. The essential guide

Young, Isabelle (2008): *Healthy Travel, Africa*. Lonely Planet Pocket size. Includes basic First Aid

Werner, David (1993): *Where There is No Doctor.* Macmillan Excellent guide for non-medical people going to remote areas. Heavyweight.

The books above will provide additional references should they be needed.

The Foreign Office website provides important information and should certainly be consulted before you go: www.fco.gov.ukf

Various websites offer up-to-date medical advice e.g.: www.fitfortravel.nhs.uk

Outdoor shops often sell more compact guides to First Aid

Nothing beats going on a First Aid course.

There are several courses available on 'wilderness medicine' - see the RGS-IBG website for details.