October 2016
International Free Flying Magazine

Cross Country 174

ANTOINE GIRARD FLIES INTO HISTORY

Thermalling on Broad Peak at 8,100m

INTO THE WILD

From an alpine hike-and-fly to a month-long trip in the Himalaya it always pays to be prepared. Pilot and expedition medic Dr Matt Wilkes has some good advice for us all

As an expedition doctor, my job is to help clients achieve their goals as safely as possible, by both preparing in advance and accompanying them on trips. I have to think about the people, the environment and the activity, hoping for the best and preparing for the worst, trying to maximise groups' potential and mitigate their risks.

An expedition is simply a journey with a purpose. It could be anything from a local XC to a multi-week vol-biv in the Karakoram. It is impossible to write an article that covers each and every expedition. All trips are unique, with their own particular set of clients, equipment and environments, and their own constellation of challenges and goals. I have tried to focus on those aspects of expedition medicine that apply equally well to a day on the hill as to a grand foray into the wilderness. These include listening to your own body, a little bit about group dynamics, the importance of communication, answers to some common medical questions, thoughts on first aid kits and a few handy resources.

Physical health

Preparation for an expedition begins with an assessment of a client's physical and mental health. For a long trip overseas, we might take detailed medical histories, do physical tests, liaise with family doctors and recommend vaccinations. However, we should really be thinking about our fitness every time we fly.

Most of us would agree that being calm, well rested, adequately fed, hydrated and a comfortable temperature will maximise the potential for a satisfying flight. However, we are perhaps less good at being honest with ourselves when we are not at our best. Aviation and medicine are peppered with checklists. Some people love them, others hate them and we all get 'checklist fatigue' at times. That said, I think checklists are invaluable for situations where we are likely to (or would like to…) ignore certain important things.

I'M SAFE

I'M SAFE is one useful way of being honest with yourself about your fitness to fly, whether you are on your local hill or out in the wild.

Illness and Injury: Are you suffering from any symptoms that might affect you in flight? These might not be big things: colds, coughs, altitude illness and traveller's diarrhoea will all knock your performance. They also might not prevent you from flying, but awareness of their effects will help you modify your plans appropriately.

Medication: are you taking any prescription or over the counter drugs? For example, travel sickness tablets and antihistamines will all affect wakefulness and balance to some extent.

Stress: Many of us fly to escape the stresses of daily life, but are these stresses preventing you from focusing on flying safely?

Alcohol/Recreational Drugs: Had a beer or a joint? Hungover?

Fatigue: Poor sleep and exhaustion will affect reaction times, memory, mood, judgment and

◂MOUNTAIN ZONE
Hike-and-fly in the Swiss Alps
Photo: Jérôme Maupoint

▲OFF THE BEATEN TRACK
Hiking up to take-off on a large south face in the Bernese Oberland in autumn, a good way to make the best of the late season conditions in the Alps
Photo: Jérôme Maupoint

balance. As a shift worker, I've made a rule for myself that no matter how good a day looks, I won't fly after a night shift until I've had a proper sleep. Equally, if you have already flown lots of hours in a week, maybe have a rest day? As a society, we massively underestimate the effects of fatigue.

Eating and drinking: Little and often will help you stay on form.

Group dynamics

Even with fine physical health, a group's behaviour is key to a safe, successful expedition. Group dynamics often determine the outcome of crisis situations.

Group dynamics are widely studied in psychology, economics, medicine and aviation. Whole books have been written on the subject and there are many useful models to employ. However, for this article I would like to focus on the two areas common to all expedition groups. These are heuristic traps and leadership/followership. Both are relevant whenever you fly, and if ever you find yourself confronted with an accident.

Heuristic traps

Heuristic traps are pitfalls, the patterns of thought that lead to bad decisions. Understanding them is key to minimising risks while on expedition. Given that the vast majority of paragliding accidents are caused by errors of judgment or piloting rather than equipment failure, they are particularly pertinent to flying. The traps are: familiarity, consistency, expert halo, social facilitation and scarcity.

For the research evidence behind these traps, please read Ian McCammon's fantastic article 'Heuristic Traps in Recreational Avalanche Accidents: Evidence and Implications' (Avalanche News 2004).

Familiarity: *You rush out after work to the local hill for a quick evening flight. Conditions are gusty but flyable. You haven't checked the latest forecast but you know the place like the back of your hand, so you go. The wind picks up fast and you are blown over the back.*

The temptation to skip basic checks or to chance a risky line is much higher when you know a place well. Experts are far more susceptible to the familiarity trap than beginners, who may know less but tend to look at a situation with fresher, more objective eyes.

Consistency: *You've checked the forecast thoroughly and it looks like the perfect day to*

attempt the big line you've been planning. By 2pm, the thermals haven't built as much as you'd hoped, but you leave the hill anyway and head for the first waypoint. You bomb out. If you'd modified your plan and stayed local, you'd have had a much more satisfying flight.

When we make a plan, we do so based on a set of assumptions. Changing these assumptions halfway through executing a plan requires much more thought than just sticking with our original ideas. Try to look on situations as they are, not as you'd like them to be. It's easier said than done.

Expert Halo: *You are joined in a thermal by a pilot flying an Enzo 2 and a sleek competition pod harness. He climbs with you for a bit then ducks out of the climb, heading to an area you don't think looks that promising. Still, you follow him and both of you bomb out.*

In most groups, whether on the ground or in the air, we make conscious or subconscious judgments as to who is an 'authority'. That person might be the official guide, or simply the most experienced, the oldest, loudest: all or none of the above. Once we have granted someone authority, we then tend to assume they know more than they actually do, in a particular situation. This can catch everyone out.

Indeed, when McCammon studied group decisions in avalanche incidents, he found that small groups with no avalanche training making decisions by consensus were actually less prone to accidents than those led by an 'authority' with experience.

Social Facilitation: *You have about two hundred hours and are out with a group of new pilots. You are more confident in your skills than they are so you fly hard, taking bigger risks. Alternatively, you are a new pilot with a group of experienced pilots, you are intimidated so stick to the hill, becoming positively risk averse and bombing out earlier than necessary.*

Social facilitation is the hardest trap to explain and more subtle than simply "crumbling or showing off". Nor is it the same as acceptance, which is subconsciously doing things you feel will gain the approval of others.

Rather, social facilitation is about how we judge our abilities relative to the group around us, and so how our degree of confidence in these abilities will vary depending on who we are with. In other

▼WHITE WALKER
Adrien Hachen contemplates a take-off above a sea of cloud
Photo: Jérôme Maupoint

▲FAR FROM HOME
Flying during the Serach Projects expedition to Pakistan this season
Photo: Krystle Wright

▶SAM SPLINT
A Sam splint rolls up and packs small until needed, then it can be bent into many shapes
Photo: Matt Wilkes

words, around an average group, those with less confidence will become even more risk averse and may underperform, whereas those with more confidence will become even more risk-accepting and may overreach.

This is a useful one to bear in mind when you are feeling intimidated, or if you are coaching others.

Scarcity: *You've planned a trip to the Alps. Unfortunately, the weather is unflyable, but eventually becomes marginal on the last day. You wouldn't normally take off in such conditions, but you've been going crazy for five days inside and spent a lot of money to get out there. You end up having a very stressful flight.*

The scarcer the resource, the more risks we will take to obtain it. On expeditions to far places, the temptation and the perceived pressure from friends or sponsors to fly the big line or to make the summit can be enormous. Equally, in the UK we can have long spells off flying due to poor weather. How many times have we all taken off on a marginal day, or ignored the fact that we were not really current, just because it's not been flyable for ages and we've driven for two hours to get to launch?

Leadership/Followship

Those were some of the traps to be aware of and, as the expert halo idea shows us, deferring decisions to a leader might not always be the best idea. However, the exception is in a crisis, where explicit and effective leadership and followership are essential. I like all expedition groups to have a designated leader for particular situations, and to prepare the group for their roles by running practice simulations. You can do the same in your paragliding club or amongst your group of friends.

Accident scenes are chaotic. In the seconds following a crash, people are often too stunned to move. Then suddenly, everyone starts rushing around with different ideas and priorities. Some people will want to take over, others will want to hide but ultimately, everyone is looking for a task. However unless someone takes control, some of these tasks will be duplicated and others ignored. Valuable time will be lost and the safety of the whole group may be put at risk.

Stepping up to fill the leadership void is difficult, particularly amongst a group of friends or equals. Leading can feel exposed and you might worry about being thought of as pushy or arrogant. In fact, most groups feel only relief when one of their number takes charge. I actually prefer to use the word 'coordinator' rather than leader. Coordinator carries less emotional weight and is a more accurate description of the role.

The coordinator at an accident does not have to be the person with the most medical experience. That person should be applying all their focus and energy to the casualty. Instead, the coordinator should be able to take a global view and try to stand back, delegating when possible. This is harder than it sounds. When we teach on Advanced Life Support courses, we often have to physically drag junior doctors away from the patient, forcing them to stand back from the bed, so they can truly see all that is going on.

As coordinator, don't forget to think out loud. During stressful situations, we often internalise – however, thinking out loud will help marshal your own thoughts, as well as giving your group a sense of direction.

If someone else has volunteered to coordinate, then try to be a good follower and fall in behind them. Recognise their courage in putting themselves forward and do your best to support them. Clearly, that does not mean unquestioning obedience: of course you should speak up if you think the situation is moving in the wrong direction. However, if you are given a sensible task then do your best to get on with it.

Be conscious that the coordinator will be being bombarded with information and questions. Their mental 'bandwidth' will quickly be exceeded. As a follower, tell the leader only what is necessary when you speak to them. Try to accompany any question with a possible solution. If you are given a task, verbally confirm that you have understood and report back when it is completed. Finally, give the leader plenty of encouragement during and after the event.

So, if you find yourself faced with an accident, step up and say "I will coordinate this situation". It will make the world of difference to how the crisis unfolds.

Communication

Effective communication is key to a successful expedition and promptly calling for help can be lifesaving. If you are out on the local hill, this might simply mean using a mobile phone or a VHF radio and knowing how to call mountain rescue. Further afield, you may be reliant on HF

FIRST AID

The following are suggestions for a light first aid kit for those flying in Western Europe. Pack it down into a roll-top dry bag to protect it and minimise space.

Wound closure: 2x rubber gloves; 2x sticking plasters; 2x steristrips; 2x triangular bandages
Wound dressing: Field dressing or individually-packed sanitary pads. A field dressing, sometimes called an 'Israeli Dressing' is a wound pad attached to a six-inch elasticated compression bandage. They are the business, but if you really want to save weight, then individually packed sanitary pads are a lightweight, absorbent and clean alternative.
Tape: zinc oxide or cloth (Duck) tape. Strong, good for fixing things and can be used as a blister dressing.
SAM splint: SAM splints are lightweight, flexible, metal-foam splints. They can be used to support a broken limb or even make an improvised neck collar or pelvic binder. To store them, unroll the splint, fold it in two and place it in the back of the harness or under the seat board. A fantastically useful piece of kit.
Painkillers: 2x paracetamol 500mg, 2x ibuprofen 400mg.
Standard dose for an adult above 50kg: 1g of paracetamol and 400mg of ibuprofen (see above). They work better in combination than separately.
Food: Evacuation of a casualty often takes time. High calorie food, such as mint cake or an energy bar can help with comfort and survival.
Warmth: 2x disposable heat packs. Useful to warm a casualty by placing them under the armpits or over the chest. Good to warm your own hands on a long flight.
Extrication kit: dental floss; knife; whistle; sling and karabiner. Dental floss is light, strong and can be used to haul larger ropes. It may help to keep all these somewhere accessible in your harness or cockpit, in case you find yourself in a tree.
Permanent marker and paper: You may need to note your location, the details of a casualty or treatments given.
Think also about carrying **sunscreen** and if you are worried you might have to treat sunburn or frostbite, then **aloe-vera gel** is a godsend.

▲**SHADOW PLAY**
In the Karakoram
Photo: Krystle Wright

radio, satellite phones, Spots, Personal Locator Beacons or even word of mouth. All methods of communication have their limitations, so please give some thought to how you might communicate in a crisis.

Communicating effectively is another valuable skill. It might be that your time to transmit information is limited, so you want to make sure you have all the necessary information at hand to be as efficient as possible. The CHALET mnemonic is helpful here.

Casualties: number, names and injuries.

Hazards to the rescuers: for example, strong winds or broken power lines.

Access: description of the terrain for example, 'near a stream, on a steep slope, a bright orange paraglider'.

Location of the incident: a grid reference is ideal. (In the UK, if using an OS map then give the sheet number followed by the six-figure reference). If you are using your flight instrument then tell the operator that the reference is from a GPS. Flying clubs should also consider issuing the coordinates of commonly used take-off and landing sites to pilots

Equipment at the scene: for example, "a torch, two mobile phones, a first aid kit, and three uninjured helpers".

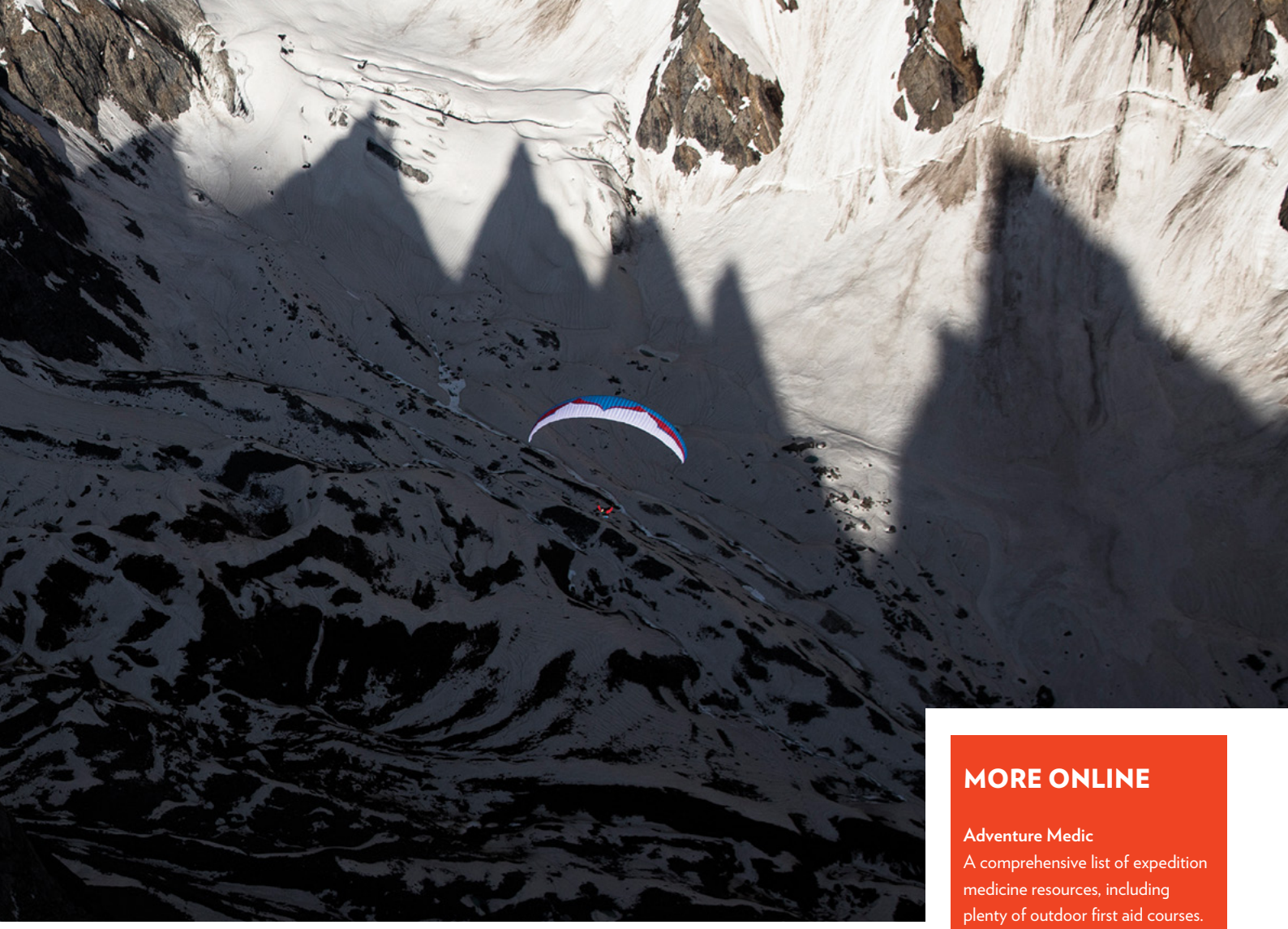
Time and type of incident: for example, "a paraglider crash into a hillside, with a fall from a significant height, at about 14.30".

Medical skills

You are no doubt thinking, "This is all very well doctor, but when do we get to the swig-of-rum, bite-the-bullet, and saw-off-the-limb part?"

There is not much actual medicine on a well-planned expedition or trip. With good preparation, group dynamics and communication, most problems can be prevented. However, some relevant medical knowledge will certainly help you make the best of a crisis.

The most effective way to learn wilderness medicine skills is on a practical course. These courses vary from one-day teaching sessions to a master's degree. The important part is to find a course specific to the outdoor environment, including topics like group safety, protection from the environment and arranging evacuation. For a



comprehensive list of courses, have a look at www.theadventuremedic.com/resources.

So, rather than try to teach the whole of wilderness first aid in a magazine article, the following are my answers to some of the questions I am asked most frequently.

Should I stop a casualty moving around?
We all know that you shouldn't move someone after a crash in case they have a spinal injury. However, spinal injuries are difficult to diagnose and manage in a wilderness setting. The decision as to whether or not to immobilise a casualty is more complex than in a city, as immobilisation can cause injury as well as prevent it, while making the process of evacuation laborious and potentially risky for the rescuers.

Spinal injuries are depressingly common in paragliding. So, if a pilot has a heavy crash then it is probably best to try to leave them in the position in which they landed. Provide support to help keep them immobile. Use gliders or harnesses as blocks, particularly aiming to stop their neck making any forward-backward or side-to-side movements.

Please don't hold them down though. If a casualty is confused or combative then let them move about, as resisting their movements could cause further injury. Instead, try to reassure them and calm them down verbally.

Sometimes however, you might need to move a casualty. It will always be a matter of judgment: for example, you might feel that they are in immediate danger, struggling to breathe or in too much pain in their current position. In that case, move them gently, trying to bring their body back into a straight line and supporting the neck at all times. Stop if a particular movement is painful. A conscious casualty is often most comfortable on their back (remember to put an insulator between them and the ground). The unconscious or vomiting casualty is typically best nursed on their side.

Moving is best done with at least three people to help, with the person holding the neck being in control of the movement. Communicate very clearly. For example, say out loud: "We are going to roll the casualty to her right, I will say ready, steady, roll and we will move on the 'r' of roll".

MORE ONLINE

Adventure Medic
A comprehensive list of expedition medicine resources, including plenty of outdoor first aid courses. A good way to find expedition doctors for your own trip if you would like to consult one.
theadventuremedic.com/resources

Travel Health Pro
A fantastic free site, with listings of health hazards and vaccination requirements for all countries.
travelhealthpro.org.uk

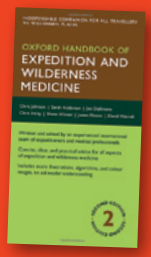
Wilderness Medicine Society
Aimed at medics but very readable guidelines on topics such as altitude, hypothermia, wound care and spinal immobilisation.
wms.org

SP Services
One of many possible online suppliers, but stock a good range of first-aid supplies.
spservices.co.uk

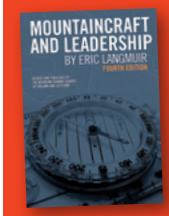
FURTHER READING

Pocket first aid and wilderness medicine
An absolute pocket bible. Dense with detail but very good.
By J Duff and P Gormly, published by Cicerone, 2012

Oxford handbook of expedition and wilderness medicine



Slightly more expedition orientated than Jim Duff's book, again excellent.
By C Johnson et al published by Oxford University Press, 2015



Mountaincraft and leadership
Not particularly medical, but very good on leadership in the outdoors.
By Eric Langmuir, published by Mountain Training England and Mountain Training Scotland, 2011

Outdoor first aid: a practical manual

Written by a member of UK Mountain Rescue. An excellent book, but comes as a big hardback so not portable like the others.
By K Wills, Pesda Press, 2013

Heuristic Traps in Recreational Avalanche Accidents
By I McCammon, Avalanche News, 2004
Download at ***www.goo.gl/sMyoSf***

Make sure everyone understands the plan before initiating the movement.

Is it okay to use a tourniquet to stop bleeding? There are many ways to stop bleeding, of which tourniquets are one. Tourniquets have seen a resurgence in popularity following the wars in Iraq and Afghanistan and they are certainly an effective way of treating life-threatening limb bleeding. It is important that once they are applied, they stay on tight until the casualty has reached definitive medical care. Loosening them will just wash off any blood clots that have started to form. However, as using a tourniquet will often lead to the loss of the limb, they should only be applied when you judge life is at risk.

Generally, bleeding is best treated by applying direct pressure to bleeding points. Remember not to take the pressure off as, like the tourniquet, any clots will then wash off. Elevating, straightening or splinting the limb and keeping the casualty warm will all help too.

An important way to stop internal bleeding is to promptly bind the pelvis. Binding the pelvis is a simple skill that is worth learning as a paraglider pilot, given that pelvic fractures are fairly common in hard crashes.

Binding the pelvis: The pelvis is a ring made up of two semi-circles. When it fractures, these semi-circles split apart, like an open book. To stop the bleeding in a pelvic fracture, you need to bring these back together, 'closing the book'. Tie a loop very firmly around the base of the hips/top of the thighs and also tie the legs together at the ankles. A jacket, glider strap or belt will all work well here.

The correct position for the tie is usually a little lower than people think. Described anatomically, the tie should be at the level of the greater trochanter of the femur. In other words, at the knobly bump on the side of the upper thigh or roughly the middle of the flies on a pair of trousers. Binding the pelvis can be life-saving and I would do it in all crashes where the pilot appeared to have serious injuries.

Why does keeping the casualty warm help stop bleeding? Keeping a casualty warm and comfortable is not just a compassionate act. Blood clotting worsens significantly with cold, so keeping a casualty warm will help prevent further blood loss. When you reach a casualty, some of your first thoughts should be about sheltering them from the elements. Put something under them to prevent conductive heat loss to the ground, as well

as covering them up to stop convective, radiative and evaporative heat loss to the air. Gliders are very effective blankets, but beware of having loose gliders around if a helicopter is expected overhead.

What painkillers should I give? Managing pain in the wilderness setting can seem daunting. After all, when confronted by someone with a broken leg, giving some paracetamol might seem like a bit of an empty gesture. However, it is not, and there is plenty more you can do too.

The most important thing you can do is to provide reassurance. Hold the casualty's hand and talk to them, tell them what is going on and what everyone is doing to help. This has been shown to reduce pain significantly in a number of studies.

Think about what else you could do to make them more comfortable. Better shelter? Warmth? Food or water? Helping them go to the toilet?

Protect them from further injury. This may mean putting on a sling, padding a wound or splinting a limb. Splinting fractures, and returning them to anatomical alignment provides considerable relief. I accept that straightening a badly deformed ankle is not for the faint-hearted.

Finally, if the casualty is alert and can swallow, then give them any painkillers that you have. Paracetamol 1g and ibuprofen 400mg are synergistic, and will help even a broken leg. Give half doses if the pilot is under 50kg and avoid ibuprofen in asthmatics unless they have taken it before.

Can I give a casualty food and drink? In hospital, we fast patients before an operation to reduce their chances of regurgitation during an anaesthetic. However, in the outdoor setting it is much more important to keep a casualty energised and hydrated during a prolonged rescue. Food or water will not delay their treatment later on, as a modified anaesthetic can be given straightaway in an emergency. However, be careful to only give food or water to an alert casualty (if they are drowsy, then there is a risk they may choke) and only give little bits at a time or they may vomit. Avoid giving a casualty alcohol.

If I do any of this, will I get sued? Sadly, we live in a world where people can be afraid to help for fear of litigation. In general the law is reassuring though, and protects Good Samaritans acting sensibly and within their limits. Try to act with the consent of your casualty and be realistic and proportionate in what you attempt. However, if you have some wilderness medicine skills, then please don't be afraid to use them.

Keeping notes during an incident is good practice. Notes help healthcare professionals and accident investigators later on, and greatly reinforce your position in the unlikely event that you are asked to defend your actions. Notes do not have to be formal: a simple description of the incident, the state of the casualty and the time and nature of any actions taken is more than enough. Try to make the notes contemporaneously: either during, or as soon after, the incident as possible. If you are coordinating, you may want to assign someone the task of keeping records during an incident.

Kit to carry

Medical kit is probably the least important part of expedition medicine but gets a disproportionate amount of attention. You can deal with most situations with good planning, group dynamics, communication and a few first aid skills. Expedition medical kit is purely there to expand the range of minor injuries you can treat and to improve your chances with some of the major ones.

There is no single first aid kit to suit every expedition. What you need will always change depending on what you are doing, what problems you expect to encounter and your own skill set. My normal paragliding first aid kit weighs a few hundred grams, but I've been on trips with 70kg of equipment in the past.

Only pack items that you can confidently use. Remember to think about environmental protection when composing your kit: sunscreen, warmth, shelter, food and evacuation.

If you are travelling abroad, then ensure that any medications you are carrying will be legal both in transit and at your final destination. This is particularly important if you are transiting through the Middle East, where even some allergy tablets and over-the-counter painkillers can land you in serious trouble. I've put some suggestions for a first-aid kit in the sidebar.

Conclusion

It is hard to sum up the medical speciality of expedition and wilderness medicine in a single article. Still, I hope that these thoughts have given you some ideas when planning your own adventures.

Please remember to focus on preparing people more than kit. Think about communication and leadership. If you have any more questions, please get in touch. XC

◂NEVER STOP EXPLORING
Up close with late-season snowpack in the Swiss Alps
Photo: Jérôme Maupoint

CHALET CARD

I've put the CHALET mnemonic and some basic first aid prompts together on an Emergency Action card. You can download it, print it out and write the coordinates of your commonly used sites on the back. Search 'Chalet card' on xcmag.com