

the adventure medicine magazine

adventure medic

issue 2 / winter 2013

frostbite

urban search and rescue

hypothermia



skiing the haute route ◦ the manaslu disaster ◦ electives in nepal ◦ photo essay south georgia ◦ astrophotography ◦ seal bites ◦ ski first aid ◦ mountain medicine courses student photo competition ◦ gear, news and reviews

work to live



Welcome to the second issue of Adventure Medic. We've been overwhelmed by the response to our first edition and the hundred or so pages of this new issue reflects the wonderful range of contributions we've received.

In this instalment, we bring you expert articles by Professor Chris Imray and Alistair Simpson, while James Yates surveys the landscape of urban search and rescue. Rachel Anderson give us a taste of the life we could be leading and Paddy Cave talks of lives lost. In addition, we have a truly stunning Portfolio from Sam Crimmin, as well as the winners of our student photo contest, elective and course reviews and much more.

Given that we are bursting at the seams with articles, we hope that this will be the last issue involving an unwieldy PDF file. For Issue 3, we plan to craft something a little snazzier and altogether easier to navigate.

So, we hope you enjoy this edition and please always remember: Adventure Medic is for you. Read us, write for us and let us know what you think. Send us your favourite videos, show us your best pics. We'll share them with the world.

Matt, Luke, Ellie, Graham, Rowena, Ollie and Greg
The Adventure Medic Team

Cover image: Mike and Stu Belbas / Verbier Summits / [Website](#)

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published quarterly and
will always be free.**

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News

News, jobs, courses, events and other gems from the world of the Adventure Medic.

THE COLDEST JOURNEY

Never known to shy away from a challenge, 'the world's greatest living explorer' Sir Ranulph Fiennes' latest expedition is perhaps his most ambitious to date. Aptly named 'The Coldest Journey', Sir Ranulph and his six-strong 'Ice Team' prepare to make the 2000 mile journey across Antarctica unsupported. This has never before been done in winter. Captain Scott famously ventured 60 miles into the continent in winter 1911, before abandoning it as 'the worst journey in the world'.

Spurred on by the recent successful winter Arctic crossing by the Norwegians, the team at Coldest Journey are keen to secure Britain on the map as champions of polar exploration.

The expedition's ice-strengthened South African research ship SA Agulhas arrived in Antarctica's Crown Bay on 20th January. Since then the team have been establishing a base camp and making crucial preparations for the long journey ahead. On 21st March they will begin their 6 month slog across almost 4000km of snow and ice to the Ross Sea.

The Ice Team must be entirely self-sufficient, as no search and rescue operation is possible in such a remote and extreme environment. Two D6N track-type tractors have been modified to tow two large shipping containers which will serve as the team's living quarters, as well as house the expedition's scientific equipment, food and fuel for the six month journey.

The expedition aims to raise US \$10 million for the charitable initiative Seeing is Believing, tackling blindness in the developing world.

More info [here](#). Or, keep up to date with progress aboard SA Agulhas at the [blog](#).

WORLD CONGRESS ON DISASTER AND EMERGENCY MEDICINE

The 18th World Congress on Disaster and Emergency Medicine is coming to Manchester from 28-31st May 2013. The focus this year will be on standards, practice and assessment in International Development, Disaster Response and Humanitarian Assistance.

Information on registration is found [here](#).

INSIDE THE TRAVEL LAB

Meet Abigail King, a British doctor who handed in her scrubs and opted instead for a writer's life on the open road. Abi completed her medical training at Imperial College, London before working for several years in Accident and Emergency. She also studied Wilderness Medicine at Oxford University. Now the author of a highly successful travel and adventure blog, 'Inside the Travel Lab', Abi's work has featured in the National Geographic Traveler, the BBC and Lonely Planet, to name but a few. We're a little bit jealous.

Click to [learn more about Abi](#) or subscribe to her [blog](#).

RESIDENTIAL WEEKEND COURSE IN MEDICAL FRENCH

Skills in medical French are essential for work or student electives in French-speaking countries worldwide and are highly [►](#)

desirable for work with international relief agencies such as Mediciens Sans Frontiers. The Anglo French Medical Society runs a residential weekend course in medical French, this year taking place from 5-7th April 2013 at the University of Warwick, UK.

The course is designed to accommodate for all levels of linguistic expertise, and participants are grouped with those of similar ability. For more information and details of how to register, visit their [site](#).

BANFF MOUNTAIN FILM

FESTIVAL TOUR

The 2012/13 Banff Mountain Film Festival Tour continues with lots of upcoming dates in Europe. Find your nearest screening [here](#).

SKIMO SCOTLAND

Winter 2013 sees the introduction of ski mountaineering (SKIMO) racing to Scotland. This sport is already well established in North America and the European Alps and combines downhill skiing with mountaineering. Skimo Scotland are hosting 4 races across 4 ski resorts this winter.

Join in the fun on their [website](#).

FORT WILLIAM MOUNTAIN

FESTIVAL, SCOTLAND

This celebration of all things mountain, the Fort William Mountain festival runs from 21st-24th February 2013, and features an enticing array of adventure films, guest speakers and workshops on everything from avalanche awareness to outdoor emergency first aid.

Click to see the [full programme of events and buy your tickets](#).

WINGS OF KILIMANJARO

Adventure Medic Editors Matt Wilkes and Luke Summers have just returned from providing medical care for this record-breaking charitable expedition.

The venture, brainchild of Australian adventurer (and celebrated horse dentist!) Adrian McRae, saw ninety-five paraglider pilots and up to six hundred porters summit Kilimanjaro and bed-down at 5800m in Crater Camp. They were waiting for the weather to lift, in the hope of flying their gliders from the summit to Moshi, down on the plains.

Sadly, the weather didn't break and all had to walk down. All bar one that is - Sanu Babu Sunawar, National Geographic Adventurer of the year flew off the mountain with his guide at great personal risk.

Matt and Luke were just happy to get everyone down in one piece, but you can expect a full report and an interview with Babu in the next issue of Adventure Medic.

The underlying aim of Wings of Kilimanjaro was to raise one million dollars for Tanzanian charities. Money already donated has been put to excellent use, and Matt and Luke were able to see this first-hand when they visited a new borehole, providing clean water to a number of Maasai villages.

You can visit the expedition [website](#) to learn more here, or even [make a donation yourself](#).

RSM ANNUAL MEDICINE

OVERSEAS CONFERENCE

Friday 12th April 2013, London.

A must for those interested in public health or research in conflict or emergency settings.

Register [here](#).



An MSF team prepare to anaesthetise a young boy prior to surgery in the east of Democratic Republic of Congo © Dominique Pageot / MSF

“Médecins Sans Frontières (MSF) sent me to Walikale, a town in the jungle in the east of Democratic Republic of Congo. During decades of civil war, the people and the town had suffered enormously. There was no infrastructure to speak of and conditions in the hospital were decidedly basic, but at least it was a brick building, with running water and intermittent electricity.

Most of the anaesthesia I did had to be completely basic – where possible we avoided intubation and used intravenous ketamine to maintain spontaneous ventilation – but sometimes a case can become

complicated. For instance, we had a young boy with a typhoid perforation and peritonitis, on the back of reasonably severe malnutrition. He needed a laparotomy, bowel resection, and hence intubation. The red rubber endotracheal tubes had rotted in the heat and I had to dismantle and reconstruct the valves in the circuit before it would work. The operation itself went well – it just required a bit of DIY.

MSF is always on the lookout for anaesthetists to work in remote places like Walikale. It is not an easy life, and you often find yourself well outside your usual comfort zone. But when people need

help, and you have the required skill, it is immensely rewarding.

Each and every day you have to expect the unexpected. Sometimes it is difficult to cope with such enormous demands, and you need to be humble enough to realise that you can't sort out everything all of the time. But come and join MSF, and you will be caring for people who have absolutely nowhere else to go for help.

Steve Harris, anaesthetist

i **MEDICAL DOCTORS and ANAESTHETISTS**
Médecins Sans Frontières (MSF) urgently needs your help www.msf.org/work_overseas

<p>WHO WE ARE</p> <p>Médecins Sans Frontières/Doctors Without Borders (MSF) is the world's leading emergency medical humanitarian aid organisation.</p> <p>We offer assistance to populations in distress, and to victims of disaster and armed conflict, without discrimination and irrespective of race, religion, creed or political affiliation.</p> <p>In emergencies and their aftermath, we provide essential healthcare, run hospitals and clinics, perform surgery, fight epidemics, carry out vaccination campaigns, operate feeding centres for malnourished children, and offer mental healthcare.</p>	<p>WHO WE NEED</p> <p>ANAESTHETISTS: Responsibilities include anaesthesia for emergency obstetrics, general surgery and trauma in both adult and paediatric populations, and joint responsibility with the surgeon for the perioperative care of patients including basic ICU management and resuscitation. In addition, there may be broader roles such as anaesthetic needs assessments for new projects.</p> <p>MEDICAL DOCTORS: Along with hands-on medical work, responsibilities include supervising and training local medical staff, planning medical programmes and reporting on medical activities.</p>	<p>ESSENTIAL CRITERIA</p> <p>ANAESTHETISTS: Proven experience in anaesthetics – experience of paediatric and obstetric anaesthesia is particularly useful</p> <p>MEDICAL DOCTORS: Training in tropical medicine and/or infectious diseases (especially TB and HIV/AIDS)</p> <ul style="list-style-type: none"> ■ Full GMC or Irish Medical Council registration ■ Proven clinical experience after registration ■ Ability to provide training and supervision ■ Ability to work with limited resources ■ Willingness to work in unstable areas
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Eng Reg Charity No. 1026588 Irish Reg Charity No. CHY18196

to the ends of the earth

It's easy to get trapped in the medical life. There is always another rung on the ladder too close to hand. **Rachel Anderson** decided to do the opposite. In 2009 she took a trip to the Himalayas. That led to a sprawling, multi-year adventure taking in Everest, the Pole and then Everest once more. Here, she talks us through her extraordinary time.

Words and photographs, Rachel Anderson.





May 2012, Camp two on Everest. It was 9pm and I was in a small, cold, dark tent with my friend David Hamilton of Jagged Globe, listening to a crackly BBC World Service. Manchester City won the Premier League in the final three minutes of injury time. I lay there, breathing in the thin air of 6400 metres savoring the thoughts of my family celebrating back home.

It was quite a moment but thinking back, there have been lots of special moments in the last few years: standing at the South Pole with Grant, a man who'd skied the last degree on a sit-ski after a snow mobile accident two years before; flying out of base camp with a Welsh rugby player who had got frostbite on the summit; mirror signaling a Russian cargo plane in to land on the ice of Antarctica; or just hanging out with friends wearing down jackets playing Texas Hold 'Em poker knowing that I had a full house on the flop.

It's been quite an adventure and it all started in 2009 when I decided to leave my Emergency Medicine training post in search of fun and high times in the Himalaya.

Pheriche

I'd met the Himalayan Rescue Association team

at the World Mountain Medicine Congress in Aviemore. After teaching Dr Ken Zafren how to Ceilidh and harassing the Kathmandu office with emails, I finally got the job of working in Pheriche, a clinic on route to Everest for the autumn of 2009.

There were four of us from the UK working together. Myself, a paramedic and a GP and her partner alongside a Sherpa cook, the legendary Ang Rita and Bhuwan, a special young Brahman from Kathmandu. We hiked up through stunning scenery on a trail I have come to know very well with yaks carrying our medicines and kit.

The clinic is open during spring and autumn seasons when climbers and trekkers are in the area. It serves the local people well, being the only place for healthcare within a ten-mile radius. There are no roads. We'd heard stories of bleeding PPH's receiving blood from relatives and being carried down to Lukla from Dr Kami at Kunde Hospital. So, we arrived at Pheriche with a little fear and a lot of excitement at what was to come.

It was a great season treating over five hundred patients, half locals and half westerners, with a variety of problems ranging from High Altitude Cerebral Oedema and pneumonia to the dreaded

Delhi belly. As they say, 'there are those trekkers who have Delhi belly in the Khumbu and those who are about to get it'. Fortunately with Ang Rita's huge portions of delicious chicken curry and dal we were safe and well fed.

Most days were calm: lectures on altitude sickness for the trekkers coming through, treating the odd yak with conjunctivitis or a horse with a fractured jaw. When the loud door-bell would ring though, you'd know that there would be a porter with a sick patient on his back, having carried them down from higher up the valley. And they could be really sick, often with oxygen saturations below 50%, cold and barely conscious. We'd give them a dose of dexamethasone, nifedipine and Viagra and put them in a Gamow bag on oxygen. It was satisfying to watch them wake up and recover, but as we all knew - it was the locals bringing people down to the clinic that really saved lives.

During my time in Pheriche, we all managed trips away. I climbed Island peak and Lobuche East and came down over the Cho La pass through Gokyo and its incredible blue lakes. Sitting at the sixth lake under the towering Cho Oyu with no-one for miles around and the thought of snow leopards nearby was an inspiring moment. Struggling up the fixed ropes of Island peak in a gale gave me

my first taste of high altitude mountaineering. Whilst I love my Munro bagging as much as the next girl, it has to be said that standing on a 6000m peak looking up at the Lhotse Face does leave you wanting more.

Dr Freer and Everest ER

We were also lucky to meet Dr Luanne Freer whilst working in Pheriche. Some years ago, she had trekked up to base camp to find the local community poorly provided for, as well as a general lack of understanding of altitude medicine amongst the medical practitioners.

Over the last ten years there have been huge improvements in the practice of altitude medicine. This is likely a result of more interest in adventure travel as well as the availability of courses on expedition medicine worldwide. With consensus and collaboration we now have Wilderness Medical Society guidelines to aid our practice and even a Diploma in Mountain Medicine based here in the UK. Things have certainly changed.

Through hard work and dedication Dr Freer set up a medical clinic tent at Base Camp, the Everest ER. The ER has developed and grown over the ►

last ten years and now has a wooden floor and two beds for overnight stay and consultations. Dr Freer tends to choose volunteer doctors who have worked in Pheriche before, as she knows they have an understanding of altitude medicine and an awareness of the local culture.

We were lucky enough to be asked to join the Everest ER team for 2011. I must say that initially I wasn't sure. I'd heard about these high altitude climbers and thought the egos might be hard to handle. Still, how could we possibly refuse such an offer?

EVEREST ER

The first weeks were incredibly cold and windy. What on earth was I doing here in this godforsaken place?! However, as the season went on and the sun warmed our cold toes, I fell in love with the place and the people.

Like Pheriche, Everest ER serves a mix of Sherpas and climbers. Most climbing teams voluntarily sign up to the clinic. They pay \$100 per climber for as many visits as they need, which also enables that team's Sherpas to come for free. It's a great system. Over the years, and particularly since the introduction of Nepali doctor Dr Ashish Lohani, the Nepalis' trust in the clinic has grown. We see more and more locals each year.

We run clinics during the day and see emergency patients anytime. We organise helicopter rescues with the teams and our Sherpa Lakpa Norbu. Sherpa Lakpa is from the Khumbu, knows everyone, has a wicked sense of humour and is a great asset to the clinic. At certain times in the season, especially when the climbers are down at Base Camp in between rotations it can be very busy. At other times it's much quieter. We have a chance to read, play backgammon and drink the odd glass of vino.

Whilst I used to be scathing of commercial climbers, I now see how much safer they have made the mountain and what a privilege they

bring to many people who otherwise would not be skilled enough to be there. This is a controversial topic and I know that many would say the mountain should be saved for 'true mountaineers'.

I used to be on this side of the argument but there are many remote Himalayan peaks that can still be climbed without assistance. Seeing the improvements to the local people's lives is enough to convince me that without a commercialised Everest, Nepal would be a lot poorer. It's true that the Khumbu valley is no longer the remote place it once was. There's now internet, hot showers and Coca Cola.

Of course some people are making money but who are we to keep Nepal in the past and deny the people progress? Indeed, the climbers we were concerned about working alongside have now become some of our firm friends. Despite the media hype, Everest is actually a place where people work together. Yes, there are disagreements between teams. However, when there are problems on the mountain most come together to get involved in the rescue.

It is an amazing feeling to be part of a Himalayan rescue. Whilst the HRA does not send rescuers up the mountain, it has a key role in organisation from the base and is able to give radio advice to the climbers and guides up high. We also run informal teaching days for the Sherpas, alongside mountain guide and climber Willie Benegas of Patagonian Brothers, covering altitude and trauma medicine.

Finally, as there are increasing numbers of high helicopter rescues, we are at the helipad receiving injured casualties for stabilisation. This year we had over twenty five evacuations, mostly by helicopter.

It's the people you meet

Whilst at Base Camp, we hung out with various other medics. Some teams have their own dedicated doctor and commonly we would work together on a difficult case or sit over a fresh coffee chatting about life on ►



expeditions. That was when Antarctica came up.

I was meant to be returning to NHS work that August but decided to make some enquiries anyway. Like anything, once you're in the business and know a few people, opportunities can arise seemingly from nowhere.

Indeed, in no time at all, I was offered an eight-week rotation on the ice working for Antarctic Logistics and Expeditions at their base on Union Glacier, through Dr Martin Rhodes. Better yet, I would actually get paid!

ALE organise the logistics of travel and evacuation for expeditionaries, skiing, kite skiing and even running various routes across Antarctica and to the Pole. They also have the monopoly on Mount Vinson trips. That year was particularly special as it was the centenary year, 100 years since Amundsen and the ill-fated Scott arrived at the Pole. That also meant 'soft tourists', taking trips to the Pole for the celebration as well as visiting the Emperor Penguins.

Alongside that, there was also the Lake Ellsworth project. ALE were transporting a 4km pipe for the British Antarctic Survey to drill down to an ancient lake deep in the ice. From their samples, they hoped to shed light on the origins of life. What could be more exciting than that?!

Antarctica

I left the UK in early December 2011 on all-expenses-paid flights to Punta Arenas on the Southern tip of Chile. Once Punta Arenas was a wild outpost where many trips to Antarctica began but it now houses a few good restaurants and bars including an expensive rooftop joint serving mojitos.

I arrived halfway through the season and boarded a Russian cargo plane modified to land on an ice runway, with 40 tourists heading to the Pole. You'd be amazed how people turn up. I went on a gear check to discover that

one couple didn't have hats and only a pair of thinnie gloves. They were advised to go shopping.

Fortunately the expeditionaries and mountaineers were better prepared. Indeed, there were some truly hard core people kicking about. An Aussie had run from pole to pole over the previous two years, a Japanese man who had crossed Antarctica with an expedition 30 years ago when there were still dogs and who survived a night in a snow hole and a British girl who crossed the pole on skies entirely alone, living through intense katabatic winds night after night.

While I managed two trips to the Pole, I have to say that it was in the warm comfort of a 12-seater Twin Otter. Still I helped take the camp down at the Pole in -35 degree temperatures so at least I've had a taste of what it was all about.

I was there for New Year and also the Scott centenary where we arrived during the night. Or, was it the morning? Who would know, with 24 hour daylight and an eight hour time difference between us and the American base one kilometer away?

The pole is at 2800m, over 3000 if you bear in mind that the air is thinner at the pole than at the equator. Arriving there, playing cricket, visiting the base and celebrating the centenary with a glass or two of wine meant a rough next day. Catching up with old friends from Everest however was a real treat. The guides do the rounds and meet at various cool places in the world. I suddenly realised I was a part of this.

Still, in honour of Scott, at least the Brits won the cricket. In fact over the two months there I learnt a lot about those early expeditions. We had a Swedish expeditionary who was also a polar expert and lectured us on the history of polar exploration.

Hearing how Scott saw the dog prints in the snow and realised that they had been pipped by the Norwegians suddenly meant something to me. They nearly made it home too: ►



Just 15 miles away from their food cache they became exhausted and perished in the harsh conditions, an on-foot expedition that no-one has repeated since.

Medicine in the Antarctic

There was some medicine too. The tent was well organised with a cozy fire, new that year and with enough kit to manage most emergencies. Unlike Everest where anyone could climb, ALE had all the business on the ice and as a result it was like a well-oiled machine. The medics were just a small part of what was a huge enterprise. Working alongside mechanics, chefs, pilots and meteorologists from over twenty different countries was a real treat and the highlight of being there.

We saw a fair amount of frostbite and trauma

and with the Antarctic marathon even had a case of rhabdomyolysis that year. The medics tended to be British as was the boss, Doc Martin, with whom the banter was endless. Christmas was a huge event with turkey and the trimmings and a talent show in a specially darkened tent, a recipe for debauchery made all the more inviting by rare darkness.

Strangely enough, inside the tents it was warmer than on Everest, with good heating in the communal tents and the never-ending sun. Putting sun cream on at midnight was bizarre and realising it was 3am and you were still up chatting with friends in bright sunlight was impossible to get used to.

After two months there, most people were severely sleep deprived. Like any remote place there were some personal stresses and issues between the staff. The medics were ►



expected to offer counsel and listening was a big part of the job.

Getting out of camp was a blessing, difficult on an active glacier where new crevasses were constantly opening up. Skiing away from the buzz of machinery into the vast emptiness and hearing the absolute silence is something I'll never forget.

Back to Everest /

Finally, I couldn't resist the draw of returning to Everest. The winter had been dry so there was less snow on the mountain. Warm days during the season meant the icefall and the Lhotse face were unpredictable. We had a major avalanche between Camp One and Two and more than one crevasse rescue. There was also the terrible tragedy of too many climbers on the mountain, when six people died waiting in queues.

With very short summit windows, it was a scramble for the top. Those who opted wisely to wait out this busy period did well and the second summit push went smoothly. For us at Base Camp it was a stressful time. Knowing that people were up high dying and that we were unable to help was awful. As usual the main teams worked well together with various rescues and many meetings about how to make the mountain as safe as possible. With over three hundred people on the mountain and little control over the figures this was not an easy task.

Still, there was fun amidst the drama. I was fortunate enough to be on a permit and in between these busy periods I made my trip to Camp Two. The icefall is an awe-inspiring place. We crossed the infamous ladders, listened to the Sherpas chant through the avalanche zone and watched the sun hit Pumori across the Khumbu Valley. Being totally alone in the Western Cwm, moving ever so slowly up to Camp Two is something I could never forget.

What an adventure it has been. [am.](#)

FMS Festival Medical Services - an unusual Charity Volunteer

- an established company delivering top quality care at festivals and other large events
- a registered charity staffed by volunteers and raising funds for medical projects at home and abroad

Currently supported projects include:

- **Tulsi Trust** – jungle healthcare in Chhattisgarh, India
- **Kambeng Trust** – rural healthcare at Bakary Sambouya, The Gambia
- **Lalibela** – construction of health posts in Northern Ethiopia
- **Sandy Gall Afghanistan Appeal** – work with landmine victims and training in resuscitation and casualty triage in Afghanistan



What we do

FMS provides a comprehensive range of medical services at events, including the Glastonbury and Reading Festivals.

- | | | | |
|-------------------|--------------|----------------|--------------|
| *Doctors | *Nurses | *Paramedics | *Ambulances |
| *Physiotherapists | *Podiatrists | *Mental Health | *Imaging |
| *First Responders | *First Aid | *Stage Crews | *Pharmacists |



Who can join?

We recruit established professionals with the adaptability and resourcefulness to provide high-quality care in a challenging environment. Those with less experience may be interested in starting in FMS as a first aider or first responder. There are also opportunities in medical communications and administration.

Joining FMS

Go to our website www.festival-medical.com for full information and application details



Good causes
Our Winter Issue charity round-up / Rowena Clark, Editor

As ever, there are plenty of opportunities to get stuck in with non-denominational, NGO charitable organisations at home and abroad.

MEDICAL AID FILMS

Medical Aid Films is a somewhat innovative charity whose aims are to reduce maternal and childhood mortality in Africa through the medium of film and animation. By designing and distributing simple, culturally sensitive films which look to improve basic healthcare, they hope to deliver a simple intervention that could make a big difference. Click for **examples of their training videos**, if you think you could use an MAF film where you work. If you can volunteer some expert advice for future film development, or if you're a film-maker with a modicum of spare time **then get involved**

MEDICS AGAINST VIOLENCE

Medics Against Violence is a local charity based in Scotland, aiming to raise awareness of knife crime amongst school children. Their volunteers are medics, nurses and paramedics, who visit schools and try to help kids understand the consequences of carrying a knife by educating them through video, open chat and personal experience. Fancy doing something outside the day-job and **volunteering your time**? Perhaps you'd like to set up something similar in your area?

Read more about MAV **here** or, if you are a lady who likes her lunch, eat, drink and be merry with them at their **50 Shades of Pink Ladies Lunch in March 2013**.

REDR UK

RedR UK was originally set up as a register for engineers needed in disaster relief. It's since developed into a charitable organisation working to recruit and train relief workers, predominantly in the fields of healthcare, sanitation, logistics and security; they run bespoke courses aimed at those wishing to work for, or already working with, a wide array of other organisations such as Amnesty International and MSF.

Perhaps aimed more at those already involved in disaster work, but relevant if you're not there yet but are contemplating delving into this world - check out their **'So You Think You Want to be a Relief Worker' course**.

ROYAL SOCIETY OF

MEDICINE

Want to learn more about world healthcare, bring yourself up to date on international charitable initiatives or utilise some top-notch resources for working outside the UK? The RSM has some invaluable links for those looking to engage in the global health agenda.

Hear a snippet from some of the medical/charitable world's **biggest 'movers and shakers'**, check out their ideas on **working overseas** and read their **monthly book review**.

SKATEISTAN

This inspiring charity is one which appeals to Adventure Medic in particular: it says it all in the name. Aussie skateboarder Oliver Percovich took his board to Afghanistan in 2007 where, together with some like-minded mates and locals, he set up Skateistan. This skate school is aimed at promoting empowerment, respect, trust and confidence for kids in Kabul through the medium of sport. The charity has a back-to-school policy and is keenly involved in returning children (in particular girls, street-working children

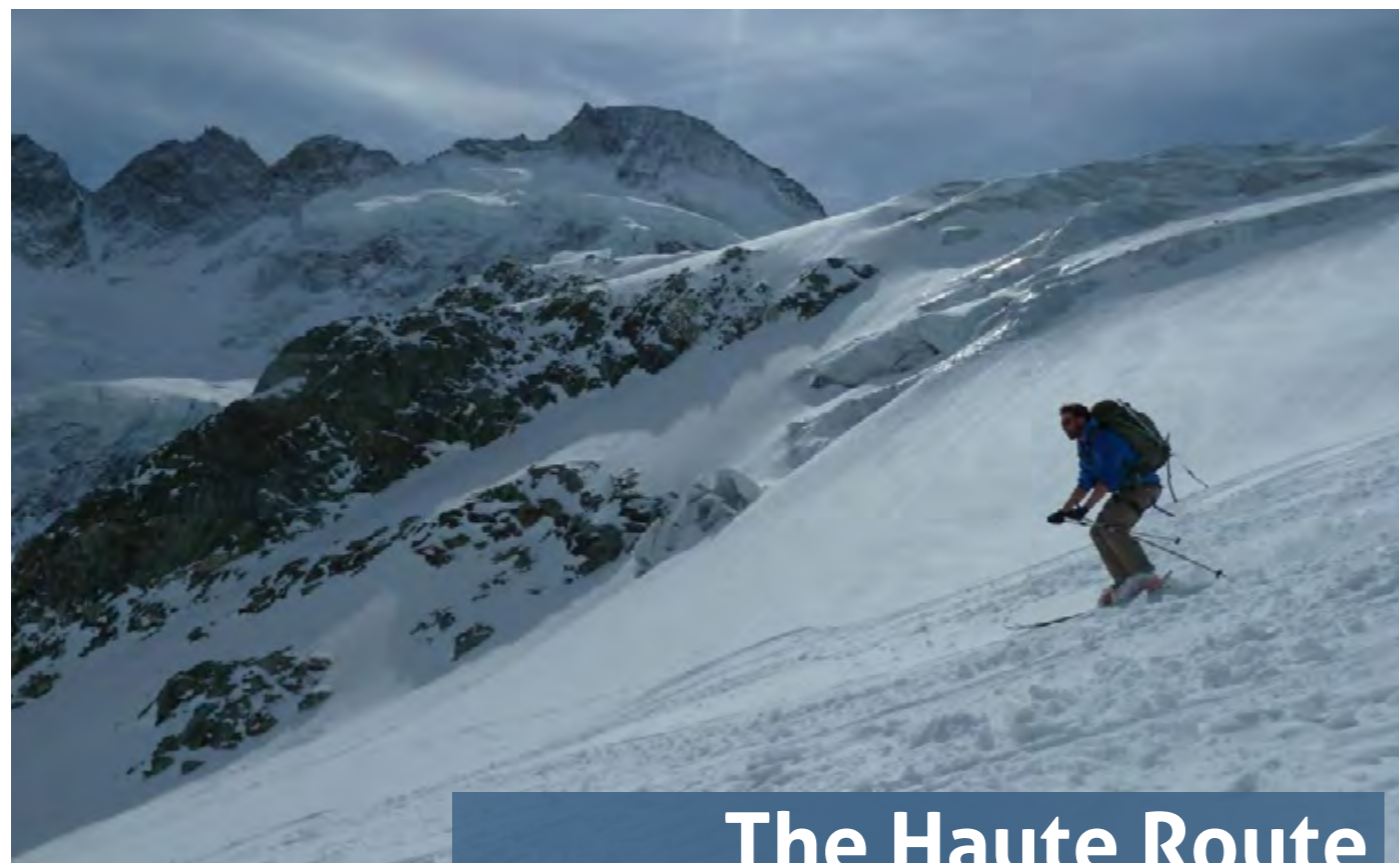
and those marginalised by disability) to the classroom. They have a 40% female student population, incredibly impressive in a country where fewer than 15% of girls complete primary school and the literacy rate in women aged 15-24 is only 18% (source: United Nations Girls Education Initiative). Check out the girls' **awesome skills**.

Given our penchant for all things video/photo funky, we were particularly interested in their latest initiative: last month they ran art and photography classes for their street kids as an introduction to the creative arts, encouraging the children to learn about lighting, composition and to build a story through **their photos**. Skateistan's video documentary on their work recently won international recognition and is also beautifully made – if you're curious, **suss out the trailer**.

Truly heart-breakingly, Skateistan were recently rocked by tragedy when a suicide bomb in Kabul killed 4 of their students, youth leaders and volunteers, aged between 8 & 17. The charity's blog tells each of their stories in a graceful, optimistic manner, and they've taken it upon themselves to raise the profile of such completely senseless deaths, raising emergency funds to cover medical bills, essential supplies, familial support and financial backing for a proper burial for victims such as these. It really is humbling, very inspirational work that these guys pull out of the bag.

If you're as impressed as we are by the charity's aims, read about the work they do in Afghanistan, Cambodia and Pakistan, sneak a peek at their **blog**, get **involved with their projects** or simply donate **any dosh you're willing to spare**.

Humanitarian skating: sheer brilliance.



The Haute Route

Words and images by Luke Summers / Adventure Medic Editor

Sadly, most of the world's great winter adventures can't be attempted in a week's annual leave. With that in mind, and spurred on by his sister's boyfriend, Luke headed to the Alps to attempt the Haute Route, a five day ski-touring passage from Chamonix to Zermatt.

Beer always tastes best when it's well earned. It also tastes great when enjoyed in stunning surroundings. Combine the two and it's a great pint. These were my thoughts whilst sitting in Zermatt under the shadow of the Matterhorn at the end of the Haute Route.

A century ago some exceptionally brave and intrepid explorers crossed from Chamonix to Zermatt by the Haute Route. Today it is more of a pay-to-play adventure for those with a few skills and adequate fitness, looking for a little more from their ski holiday. The route itself is actually not the original, but the Verbier variation which allows for more skiing down and avoids the notoriously dangerous Plateau de Couloir. The original route is still skiable if desired, for a cost.

I had always wanted to go back to skiing having given it up sixteen years ago, but I had

never wanted to miss a day on the board. If any of you have ever tried to "do a season" in Scotland then you know how precious those days on the slopes can be. However, there is nothing like the incentive of forking out a grand to spur on your motivation to learn.

A last minute off-piste lesson was booked in Austria, along with a week's practice on the slopes. The only other concern I had prior to leaving was my fitness, five days of up-and-down under my own steam seemed like a tall order for a man who had barely broken sweat in the last few months let alone done any endurance training.

Day 1 /

On the first day, we met our guide and the rest of the group: a Norwegian, a couple of (total)

bankers and a bloke from the Midlands.

Soon, we were being put through our paces to make sure we'd be up to the task. They took us up to the top of the mountain and then brought us down the trickiest, iciest gullies to check our control, and then ran us through avalanche training. In the afternoon, we pointed up hill and this is where I started to become unstuck. It soon became glaringly obvious that this was my first time touring. With a little teasing I managed to demonstrate a passable kick turn and we moved on to the best bit – heading downhill.

Day 2 (Take 1) /

Meeting up the next morning, our guide informed us that one of our group had not made the grade and would not be coming with us. Sadly, the bloke from the Midlands had not demonstrated sufficient control on his skis to be deemed 'safe' and would be offered an easier trip instead. This gave me a mixed sense of relief and fear. Relief that I had made the grade, I would get to ski the Haute Route, but fear that this wasn't necessarily the walk in the park I had envisaged.

There was clearly an element of danger here and with my limited skiing experience, had I just bluffed my way into something that I would regret? Looking round the group I was definitely the weakest remaining skier. If something was going to happen it was probably going to happen to me. Just have to suck it up, I guess. Harnessed up, transceivers set to stun and chomping at the bit, we boarded the gondola on the Aiguille du Midi to start our little holiday adventure.

We emerged in thick cloud. There were a few groups starting out across the glacier, heads bowed, staring at their GPS screens, taking the first steps of their five day trek.

Our guide wasn't so keen. Sensibly, she didn't like the idea of circumnavigating crevasses without being able to see, so we skied to the bottom to get the train, feeling a little dejected

that the first day hadn't gone our way and made our way to a hut in the resort of Verbier.

Day 2 (Take 2) /

Clear skies greeted us the next day, and we set off up the first col. Finally we were on our way on the Haute Route. As the sun climbs the heat starts to take its toll and we're all sweating, even on the downhills. After the second col, it's a long slogging traverse to the mountain Rosa Blanche.

Feeling slightly under the weather (a mild case of man flu) and being poorly hydrated, I decided to miss the last roped, 20 metre, high-exposure jaunt to the summit. Once the others had returned, we headed down to the second hut on the route.

This downhill was quite possibly the best experience I have had on snow. I was in thigh to chest deep powder of the softest, finest flakes I've ever touched. It took us about an hour to descend to the hut. If we'd gone slower, we could have easily stretched it out to at least a couple of hours, but when it's that good you just can't bring yourself to stop.

Down in the hut we rewarded ourselves with beer and potato rosti dripping with cheese and bacon. The bankers were moaning as the other groups came in that clearly it was safe enough to have crossed the glacier. Now they would have to return next year, so they could say they had 'done' the Haute Route.

Fortunately, they were quickly shot down by the rest of the group, who pointed out that the route they had chosen missed out the dangerous Plateau de Couloir and they just had the best skiing of their lives thanks to our guide's sensible decision.

Day 3 /

Day Three saw us out long before sunrise. There had been plenty of snow and the avalanche risk was substantial. We wanted ▶

to get off the hill before it had warmed enough to start slipping. Head torches on, we were straight into the ascent and I got plenty of chances to practice my slowly improving kick turns. These are the turns that end each upward traverse to get you around for the next. Once up the next col we traversed a reservoir. The steep sided slopes spread out ahead our main cause of avalanche concern. Several kilometres of holding the same uphill edge on the ski caused my calves and ankles to cramp up but I couldn't stop for fear of losing speed by adjusting my position.

The sun was once again defeated by heavy cloud and the snow was falling thick and fast as we headed off the reservoir. The final ascent to the hut was a steep one: a narrow, icy ladder of trails put down by the group ahead, flanked on one side by a precipitous drop into a ravine of spiky rocks and white water.

The ladder of trails soon gave way to a smooth sheet of ice and it was time to don our ski mounted crampons or 'cuteau'. My kick turns no longer seemed adequate, each traverse saw me precariously leaning back, balanced on a spike on an icy plane of glass. I had definitely bluffed my way into something way out of my league. I was quite scared now, head down and concentrating hard.

To my huge relief, we eventually emerged onto soft snow. But relief is short-lived. The snow was thick now and it was our turn to bow our heads. We followed our guide, her in turn following an altimeter and compass. We were completely reliant and out of our comfort zone. And then came the rumbles. The first few were quiet and distant but unmistakably the sound of avalanches.

Completely blinded by blizzard, our small parade started hitting the snow nervously with poles. Even my inexpert eye could see a big, heavy, deep layer of snow covering a two day-old firm icy base. This stuff was ready to slip and we could hear it doing just that somewhere out of sight nearby. And then it happened - our entire group dropped about a foot, as a deafeningly quiet 'whoomp' came

from beneath our feet. Our weight had caused the snow layers to dissociate.

We were luckily on a shallow slope at the time so this was no avalanche, just what's rather casually referred to as 'settling'. Somewhat misleadingly casually, we all felt. We wanted off the slope quickly. Our guide's urgency was effectively conveyed with a 'shut the fuck up and move, now' and we all hurried to obey. Thirty minutes of silent skinning passed, until rather abruptly we all walked straight into the hut, which had seemingly appeared out of nowhere. Faith in our guide's navigation skills was confirmed. More beer.

Day 4 /

The next day was a straight up and down. The up was tough though. This time all the groups set off together, trudging in each other's tracks in a single file. There was no stopping. As my legs kept shouting at me to stop, I learned a valuable lesson: they kept going if I ignored them. At least the wheezing and puffing of the bankers stopped their moaning.

At the top, we finally had a clear view of our target, the mighty Matterhorn. It had grown in the last couple of days and now dominated the skyline. The downhill was steep, fast and a whole lot of fun. That night, we heard the tale of one unfortunate, who had strayed too far from the tracks in search of untouched snow and found himself four metres down a crevasse. Fortunately, he had a lucky escape but it was a timely reminder of our vulnerability in this harsh terrain.

Later, I was shaken awake by a guide. A fellow client, who happened to be a consultant anaesthetist, was found wheezing and coughing up pink sputum in our kitchen. Worse still, he was refusing the guides' suggestions of evacuation. The altitude wasn't that high, but there was no mistaking the bilateral crackles in his chest as those of pulmonary oedema. He could barely stand or talk. The helicopter was called and he eventually, though begrudgingly, agreed to go quietly. ▶

Day 5 /

The noise of the chopper reverberated around our ears as we set off on our last and longest day. I found myself hoping that our unfortunate friend had decent insurance. Three cols to go and the usual skin up the first one was almost routine by this stage. More great downhill, this time not on a glacier so without the crevasse risk we could pick our own lines. Col two sat atop a steep slope, requiring us to use crampons and ice axes for the slow but hugely rewarding climb to the top. Another quick ski down, and then we began the final climb of the trip. We were now in Italy. The sun was blasting down and the hour's climb saw me reapply sun cream twice but to no avail. My face had come off by the top.

The view that greeted us at the top was gob-smacking. The Matterhorn towered in front of us, below us lay the path to Zermatt. This last

ski had it all: steep sections, paths under seracs (to be taken at the greatest possible speed), ice bridges over crevasses (to be taken with the greatest possible care) and the ever changing face of the iconic mountain above.

The final hour and a half of descent levelled off somewhat. We skied in deep tracks without thinking, just staring at the breathtaking views all around. At last, at the top of Zermatt, a short walk and ski saw us on to the gondola, which took us down to that truly awesome beer. am.

Flights: Geneva to Chamonix with Easyjet

Guiding: Mountain Tracks
www.mountaintracks.co.uk

Cost: 995 pounds

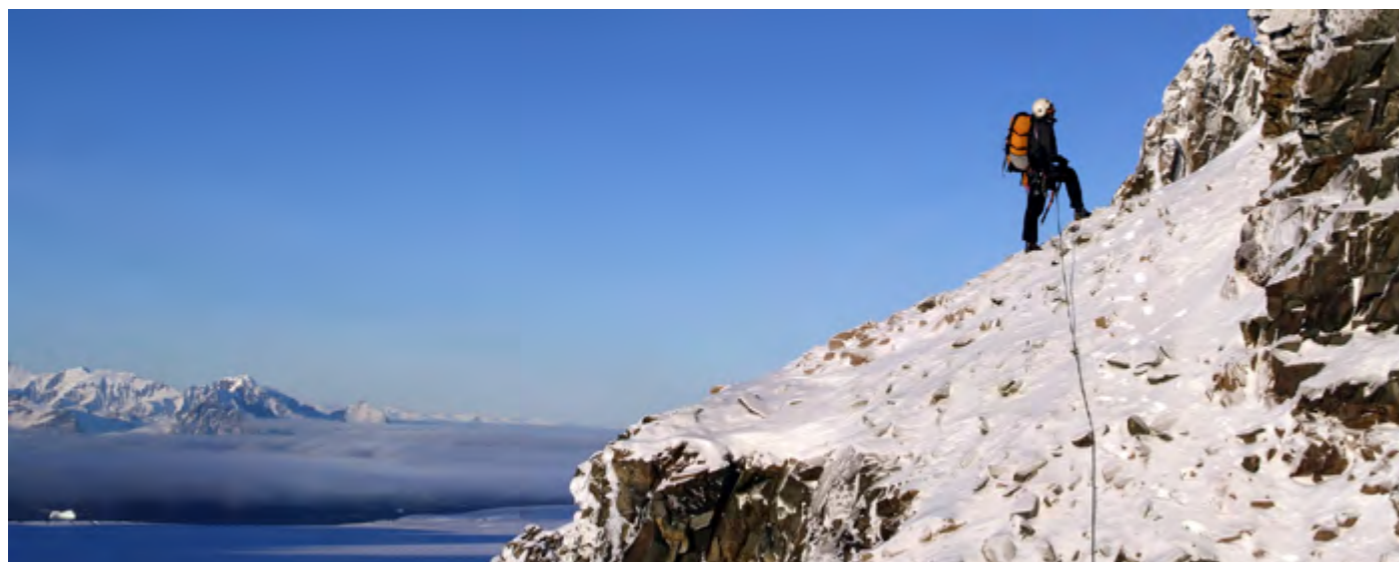
Season: I went in late March/early April but it varies depending the conditions



This photograph was taken in March this year during a 10-day Nordic ski touring trip to the Taffjord mountains in Western Norway. Norway's mountains are dotted with a network of cabins owned and operated by the Norwegian Trekking Association. By utilizing these, one can travel lightly, covering between twenty and thirty kilometers each day. This image, my favorite of the trip, was taken on the last day of the tour as my dad looked back down the valley we had skied through, it was the one blue sky day of the trip and the perfect opportunity to capture a beautiful snowscape / Marcus Stevens, Medical Student.

frostbite





In this review, Professor Chris Imray and colleagues take us through the pathophysiology and treatment of frostbite in the field and in hospital

» **PATHOPHYSIOLOGY**

The prevalence of frostbite amongst the civilian population has risen in part because of an increase in the numbers of homeless, but also because of greater ease of air travel, participation in winter sports, and ascents to high altitude.

The feet and the hands account for 90% of frostbite injuries reported. Frostbite also affects the face, particularly the nose, chin, earlobes, cheeks and lips, the buttocks/perineum from sitting on metal seats and the penis in joggers.

The pathophysiological processes have been studied extensively using both human and animal models. Local cold injury produces a succession of changes which are commonly divided into:

- 1 ▷ Prefreeze phase
- 2 ▷ Freeze-thaw phase
- 3 ▷ Vascular stasis phase
- 4 ▷ Progressive or late ischaemic phase

Skin sensation is lost around 10-15°C. With further cooling, vascular contents become more viscous, there is microvascular constriction and transendothelial leakage of plasma. As skin cools further (0°C), freezing

occurs and frostbite develops. Low ambient temperatures, wind and moisture accelerate this rate.

Unless freezing is very rapid, ice crystals form first in the extracellular fluid spaces. Extracellular osmotic pressure increases, drawing free water across the cell membrane. This causes intracellular dehydration and hyperosmolality.

As freezing continues, there are extra- and intracellular electrolyte and pH changes, dehydration, and destruction of enzymes. Cell volume reduction and possibly direct damage from ice growth occur. Cell membranes are damaged, microvascular function is compromised and endothelial cells are injured, with the endothelium separating from the arterial wall lamina.

Depending on the method of rewarming, hyperaemia, ischaemia, cyanosis, or total circulatory failure develops. Blebs or blisters may appear secondary to vasodilatation, oedema, and stasis coagulation. Platelet and erythrocyte aggregates clog and distort the vessels in viable tissue. Associated injury may cause increased compartment pressures.

As is seen in burns, reperfusion injury occurs. This may involve oxygen-free radicals,



“ Field rewarming should only be undertaken if there is minimal risk of refreezing since refrozen tissue almost always dies.

neutrophil activation, and other inflammatory changes. Prostaglandin F2a (PGF2a) and thromboxane A2 (TXA2) cause platelet aggregation and thrombosis which results in ischaemia and elevated concentrations of PGF2a and TXA2 are found in frostbite blister fluid. These eicosanoid derivatives have been heavily implicated as mediators of progressive dermal ischaemia in burns, frostbite and ischaemia/reperfusion injuries.

Depending on the degree of microvascular damage, one of two processes occurs: either vascular recovery with dissolution of clots, or vascular collapse which results in thrombosis, ischaemia, necrosis and gangrene.

» **CLINICAL PRESENTATION**

Symptoms / Patients initially describe a cold numbness with accompanying sensory loss. The extremity feels cold to touch and it feels clumsy, “like a block of wood”. Thawing and reperfusion is often intensely painful. Residual tingling sensation starting after one week has been described and may be due to an ischaemic neuritis.

Signs / Initial appearances are often deceptively benign. However with thawing, frozen tissue may appear mottled blue, yellowish-white or waxy. Following rapid rewarming, there is an initial hyperaemia even in severe cases.

Classification / Frostbite injury has been ►



Frostbitten extremities should be warmed over 15-30 minutes to one hour in a whirlpool consisting of recirculating water and a mild antibacterial agent. Rewarming should continue until a red/purple colour appears and the extremity becomes pliable.

classified as either mild/superficial (no tissue loss) or severe/deep (with loss of tissue), and this classification is based upon final outcome. Cauchy of Chamonix proposed a predictive classification system that is based on the topography of the lesion(s) and early technetium99 bone scanning. Using these techniques it is now possible to predict the likely outcome as early as two days.

Aspirin (150-300mg) or ibuprofen (400mg) may improve the circulation. Do not rub the affected part, or apply direct heat. If sensation returns, one can continue to walk. If there is no return of sensation, go to the nearest warm shelter (hut or base camp) and seek medical treatment. If at high altitude, give oxygen, fluids and descend.



Field Rewarming / Field rewarming should only be undertaken if there is minimal risk of refreezing since refrozen tissue almost always dies. The decision to thaw the frostbitten tissue in the field commits the provider to a complex course of action involving pain control adequate warming and hydration in a hostile

» **TREATMENT**

Treatment of frostbite can be divided into three phases: field care, immediate hospital care, and post thaw care. Rapid evacuation, usually by helicopter, from mountain to hospital eliminates the first phase.

Field Care / If there is a possibility of developing frostbite the subject should move out of the wind and seek shelter. A combination of warm drinks, removal of boots (consider problems with replacement if swelling occurs), and replacement of wet gloves and socks with dry ones, warming of the cold extremity by placing in companion's armpit or groin for 10 minutes only, finally putting the boots back on should help.

environment and subsequent protection of frostbitten tissue from further injury during evacuation. Frostbitten extremities cannot be used for ambulation once rewarmed.

Hypothermia and concomitant injuries should be evaluated and systemic hypothermia should be corrected to a core temperature of 34°C. Patients are often dehydrated; moreover, hypothermia causes cold diuresis due to suppression of antidiuretic hormone, so intravenous fluids are often advisable.

Post-Thaw Care / Blisters containing clear or milky fluid should be debrided and covered in aloe vera, a potent antiprostaglandin agent 6 hourly. The limb(s) should be splinted, elevated to reduce reperfusion oedema, and wrapped in a loose, protective dressing. Padding should be put between the patients' toes. Haemorrhagic blisters should be left intact to prevent desiccation of the underlying tissue. If they restrict movement they can be drained with their roofs left on.

Tetanus toxoid and opiate analgesia should be given if indicated. Ibuprofen (400mg orally, every 12 hours) provides systemic antiprostaglandin activity that limits the cascade of inflammatory damage. Antibiotics should be prescribed if there is evidence of infection.

Thrombolytic Therapy / There is emerging evidence that treatment of severe frostbite injuries with intra-arterial thrombolytic agent (tPA) or synthetic prostacyclin analogue (Iloprost) improves outcome. Patients to consider for thrombolysis/Iloprost are those presenting within 24 hours of original exposure with apparently severe injuries where digit / limb loss is predicted.

A review of absolute and relative contraindications of t-PA should be undertaken. The treatment should occur in a facility with vascular surgery and HDU/ITU monitoring capabilities.

Early Surgery / Fasciotomy should be performed if a compartment syndrome develops, but amputation should be delayed for up to three months, and certainly until the level of

demarcation is clear. However systemic infection resistant to intravenous antibiotics warrants early surgical debridement/amputation.

Nursing Care / Goals include keeping the patient comfortable, pain free, well nourished and adequately hydrated. Twice daily antibacterial whirlpool baths encourages the blister eschars to separate from underlying healthy tissue. Early mobilisation with help of physiotherapists is beneficial but further trauma must be avoided.

Amputation / Failure to delay surgery remains a major cause of avoidable morbidity. Better long term functional results are achieved with the early involvement of a multidisciplinary rehabilitation team. Early mobilisation of patients with partial foot amputations on weight bearing custom made orthoses has shown promising results.

Telemedicine / A recent development in accessing expert advice, which has been driven both by the patient's themselves and also those clinicians with a more limited experience of frostbite, is the use of the internet. A virtual opinion can be sought from anywhere in the world. The UK based service can be accessed via the Diploma in Mountain Medicine or the British Mountaineering Council websites.

» **CONCLUSION**

Although still potentially a disastrous injury associated with a high morbidity, frostbite can now be treated more effectively to ensure tissue loss is minimised and functional outcome maximised. With adequate preventative measures the risk of frostbite injury can be reduced.

With the rising prevalence of frostbite, future research remains important. However, a number of factors mean that progress is likely to be slow. Injuries tend to be variable and unpredictable, presentation is often significantly delayed and often to a wide range of different centres, there is no good animal model for basic research, and apart from the ►

military there is little likelihood of achieving significant funding for research programmes.

Research over the past 15 years has led to a new understanding of the pathophysiology of cold injury. Understanding of the role of inflammatory mediators, such as PGF2 and TXA2, has led to new active medical regimens such as the use of ibuprofen and aloe vera. Improved imaging assessment using MRA, and technetium scintigraphy, coupled with further research into the use of adjunctive therapies such as the use of thrombolytic agents and vasodilators further advancement in the treatment of frostbite.

However, prevention, early warming, early medical treatment and delayed surgery are likely to remain the mainstays of treatment for the foreseeable future. **am.**

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Photos / Header - Ali Simpson, all others Imray and Colleagues

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For some practical tuition on frostbite, maybe consider attending the Expedition and Wilderness Medicine Polar Medicine Course? More info [here](#).

NEPAL

MOUNTAIN MEDICINE COURSE



The ultimate mountain medicine course, the path of which follows the Everest Base Camp Trail up the Khumbu valley to base camp itself, held in the shadow of the world's most iconic peak.

Many of you know Dr Luanne Freer as the founder and director of Everest ER, and as a volunteer physician for the non-profit Himalayan Rescue Association (HRA) in Nepal. Founded in 2003, EverestER is the world highest clinic: a seasonal tent-based medical facility at the Everest Base Camp, 17,600 ft/5350m above sea level.

During the 17-day course you will follow the Everest Base Camp Trail from Lukla. Fourteen days will be spent trekking at an easy pace, staying in Nepalese teahouses and enjoying the spectacular scenery along the route. Luanne, who is also a past president of the

Wilderness Medical Society and Medical Director for Yellowstone National Park, will pass on teachings from her years spent working at this altitude through this mountain medicine course. She also hopes to transfer her passion for the Khumbu valley and Nepal in general.

Spaces are strictly limited and a significant proportion of the profits from the expedition go towards supporting the work of Everest ER.

Nepal, 11 - 28 October 2013 | 22.5 CME. Click [here](#) to find out more or email [Catherine Harding](mailto:CatherineHarding@expedition-medicine.com).

"The Mountain Medicine course was one of the most amazing experiences of my life lead by a world-class Exped Team. Really grateful for the opportunity to attend the course"

Contact us by email - admin@expedition-medicine.com

On the web - www.expedition-medicine.com

Expedition & Wilderness Medicine Ltd.



Seal bites

Words and pictures by Sam Crimmin

Suggested protocol for treating seal bites

- > Irrigate copiously, using tap water or normal saline
- > Remove any foreign bodies
- > Perform debridement of dead tissue back to bleeding edges.
- > Raise and elevate the limb.
- > Antibiotics should be given; doxycycline and metronidazole are probably the best.
- > Check tetanus and give if appropriate.
- > Review the wound at 24 – 48 hours in ALL cases.

The Antarctic tourist trade is thriving. The visitors share the landing beaches with the local wildlife and Elephant, Weddell, Crabeater, Leopard and Fur seals are just a few of the species they might encounter.

More and more polar tour operators are now including South Georgia on their itinerary. This small island is appropriately advertised as the Galapagos of the South and wildlife abounds. However, in the austral summer, beaches can become impassable as fur seals return to their breeding grounds.

'Sealers' or 'Spekk' Finger, a well known complication of seal bite was first reported in Norway by Bidekamp in 1907. The condition occurs when a seal bite leads to cellulitis and joint inflammation. Historically this was a serious problem often leading to a thickened contracted joint and eventually amputation of the digit. Though labeled Sealers' Finger, it is

not necessarily limited to the hand.

It was originally thought that the disease was caused by the gram-positive *Erysipelothrix rhusiopathiae*. However in 1998 Baker et al reported the isolation of a *Mycoplasma* species (*Mycoplasma phocacerebrale*) from a case of Sealers' Finger in an aquarium worker.

The debate over the causative organism makes antibiotic choice for active infection and prophylaxis difficult. *Erysipelothrix rhusiopathiae* is responsive to penicillins, cephalosporins and erythromycin. But since *Mycoplasma* lacks a cell wall, the disease does not respond to beta-lactam antibiotics but instead requires a tetracycline. Inadequate antibiotic treatment of either of these organisms could lead to local spread resulting in tenosynovitis, osteomyelitis, and in the case of *E. rhusiopathiae* there is a risk of endocarditis. [am](#).



Ski First Aid

by Tonya Cruikshank / Skifield Medical Coordinator, Queenstown, NZ

Floating through knee-deep powder or carving down fresh corduroy with the morning sun on your face, skiing is the best sport in the world. A perfect triad of speed, nature and adrenaline! Yet why on one day can it feel like a perfect run but on another a total lemon.

As skiers, we spend our time sliding fast down a slippery incline with one or two planks clipped tightly to our feet. In the event of a stack (technical term) there are some large forces to contend with.

I remember aged eight watching my father tie wooden skis to hiking boots and set off down a rarely snow-covered local hill. Yes, our skis are fancier these days and yes, there have been huge developments in ski and binding technology but accidents still happen. There are other hazards: rocks, sliding snow, metal equipment and the inevitable mixing of skiers and snowboarders, both of whom view and use the same terrain in different ways.

From a medical perspective, these hazards can create a challenging mix of sports injuries and require the ski field area clinician to adapt to a new way of working, away from the hospital and with less equipment.

Knees bend with regularity, squeezing cartilage, stretching and tearing collaterals and cruciates. Shoulders frequently dislocate, typically amongst the repeat offenders of the terrain park. Patellae, elbows, hips and fingers may also jump out of joint, not to mention any fracture dislocations. Sharp ski edges can create clean deep wounds, wrists break under the forces of direct landings and unfortunately

at times heads and spines are injured.

On a clear day, many doctors are to be found on the slopes. If you are not the official clinician and you come across an injury, what should you do?

Keep it simple and safe / prevent further injury to the injured person - cross your skis in the snow, stand someone above you to keep others from stacking themselves too. Avid heroics: ski area patrollers have a wealth of experience in scene safety, first assessment and transport. Offer your assistance but allow them to do their job. They will tell you how you can help.

Keep the person warm / hats and more layers of clothing if possible, though be careful moving any parts that may be injured.

Summon help / usually the best way to do this is to send someone down to the nearest lift or patrol base and they can then radio the ski patrol. In the backcountry someone may need to ski down or skin up to get cellphone coverage- generally much better on ridges than valley floors.

Look after yourself / if you plan to venture into the backcountry, learn about keeping yourself safe and have a healthy respect of avalanche terrain. The Mountain Safety Council runs great **avalanche awareness courses**. Never ski alone, carry the right equipment (transceiver, shovel and probe at a minimum) and most importantly practice using them regularly.

Learn more / think about an Advanced Wilderness Medicine Life Support or become a ski doctor yourself. [am](#).

Hypothermia

alastair simpson / words and photography





The expedition doctor faces many challenges, in particular the environment to which his charges are exposed. With increasing ease of access to high altitude and polar regions, cold exposure is a genuine concern.

Humans are poorly adapted to cold. Since physiological homeostasis mandates a core temperature of 37°C, insulation from the environment is required in temperate or cold climates. However, when insulation is inadequate or the environment becomes more severe, homeostasis can fail resulting in cold injury.

Cold injury can be categorised into hypothermia, non-freezing injury and frostbite. This article will focus on the first of these injuries. Hypothermia is classically defined as a core body temperature below 35°C^{1,2}

Causes /

Body temperature is maintained by a balance of heat gain and heat loss. Regulation is under hypothalamic control, with peripheral temperature receptors sending signals to the

hypothalamus which are then relayed via the sympathetic nervous system to effectors in the peripheral vasculature, piloerector muscles and sweat glands, as well as the brainstem (shivering) and higher centres.³

Following exposure to cold, this process leads to peripheral vasoconstriction, redistribution of blood flow centrally, cooling of the extremities and shivering.

Under normal conditions, body temperature can be maintained by wearing clothes, seeking shelter, shivering and exercise. Adult humans do not exhibit significant non-shivering thermogenesis.

Exercise is very effective at maintaining body temperature and can increase heat production from 100 to 1200 Watts.⁴ Clothing can insulate the body to the extent that it creates a warm microclimate next to the skin.⁵ Sufficiently warm shelter can obviate cold environmental conditions entirely. Shivering can increase heat production to 500 W, increasing energy consumption by the equivalent of five times resting metabolic rate.^{4,6} Heat homeostasis is the result of a

balance between heat production and heat loss.⁷ Therefore if heat production is impaired or heat loss increases, a fall in core temperature will result.

Wet skin or clothing increases thermal conductance and increases heat loss by convection and evaporation.⁸ Water immersion can produce a dramatic and rapid reduction in body temperature and causes 100 000 deaths worldwide per annum.⁴ Windchill can dramatically reduce relative temperatures due to convective losses: at an ambient temperature of 0°C, a wind speed of 30 knots will produce a relative temperature of -20°C.⁹

Although exercise will increase heat production, if fatigued, body glycogen stores are depleted resulting in a decreased capacity for shivering and further exercise. A low blood sugar can also impair hypothalamic responses to cold.^{4,8} Body habitus can predispose to hypothermia. While obese people are well insulated by subcutaneous fat, slim individuals will lose heat more rapidly and will rely more on other methods of insulation and heat production.^{4,8}

Physical fitness per se does not

confer improved tolerance of cold, although it will allow exercise to be maintained for longer, which may help due to increased thermogenesis.⁸ Alcohol ingestion can predispose to hypothermia by inhibiting vasoconstriction and impairing shivering.¹⁰

It is worth noting that whilst peripheral vasoconstriction and cooling reduces core body temperature loss, it also reduces dexterity significantly and this can have risks in its own right for the individual in a challenging environment.

Symptoms and Signs /

Symptoms of hypothermia are generally related to core body temperature and are progressively more severe as temperature falls. With mild hypothermia, shivering begins and mental status is altered - individuals may be lethargic or mildly confused.

As temperature falls, shivering becomes maximal, walking is impaired and speech becomes slurred. Confusion and drowsiness will become apparent and behaviour becomes

Core Temp (°C)	Features
34 – 36	Feeling of cold Seeking warmth Shivering Poor decision making Psychological changes: aggression, disinhibition, withdrawal
33 – 34	Confusion, drowsiness Memory impairment Paradoxical undressing Shivering stops
26 – 32	Limbs stiffen Risk of cardiac arrest Coma Pupils may be fixed and dilated
18 – 26	Reduced cardiac output Spontaneous VF Survival unlikely at 24°C Death

Symptoms and signs of hypothermia^{3,9}

irrational, including paradoxical undressing.

With severe hypothermia, shivering stops, further exacerbating temperature loss. Pupils may become fixed and dilated and the affected individual comatose. The appearance of the individual can mimic death. Cardiovascular instability is also a feature, particularly ventricular ►



Prevention of hypothermia

- > Ensure adequate preparation and risk assessment, especially as regards kit selection
- > Take adequate clothing
- > Have a means of providing rewarming, for example sleeping bag, warm bottle or stove
- > Avoid saturation of clothing with water or sweat – especially if windy
- > Change wet clothing as soon as able
- > Take adequate food supplies
- > Keep moving where appropriate
- > Seek appropriate shelter when conditions deteriorate
- > Use a buddy system
- > Be aware of the possibility of hypothermia

fibrillation (which may be provoked by rough handling or sudden changes in posture and cardiac arrest.⁷

Once core temperature reaches 24°C, survival is unlikely. However, survival has been recorded following a core temperature as low as 13.7°C.¹¹ Note that there can be significant inter-individual variability in symptoms for a given core temperature.¹²

Management /

Accurate core temperature measurement

will assist in management of a hypothermic patient. Oral, tympanic and axillary temperature recordings can be inaccurate; oesophageal, urinary bladder or rectal measurement is preferable.^{4,7}

First aid methods should be employed, including seeking shelter (especially from wind and rain), insulating from the ground, removing wet clothing and providing external heat, such as via a stove or by contact with another individual. Warm drinks may also help.

Of note, metallic 'space blankets' are of no

Take-home messages

- > Cold exposure can result in a number of injuries, including hypothermia, non-freezing injury and frostbite
- > When heat loss is greater than production, hypothermia will ensue
- > Hypothermia must be recognised early
- > Suspect hypothermia in individuals displaying any signs, including slow mentation, withdrawal or confusion
- > Instigate early appropriate management: isolate the victim from the environment and rewarm as appropriate to the degree of hypothermia
- > Pre-expedition planning and risk assessment are essential and may reduce the risk of hypothermia developing
- > Consider selecting equipment for managing hypothermia, including thermometers and rewarming equipment
- > Declaration of death is difficult in the severely hypothermic victim; rewarm patients before death is declared

proven benefit.⁴ Wrapping the victim in dry sleeping bags and insulating using a roll mat and bag will help.

Chemical heat packs or bottles filled with hot water may also be used with caution so as to avoid burns; wrap bottles first before applying to skin.⁷ There are differing opinions as to whether warm baths should be used; core temperature can fall due to blood flow to cold peripheries (afterdrop) and the vasodilatation may also cause profound hypotension and provoke dysrhythmias.^{4,7} If used, great care should be taken and the patient monitored closely.

Such active external warming techniques are likely to be most appropriate for mild rather than severe hypothermia.¹⁰ Invasive warming techniques include warm intravenous or peritoneal fluids and cardiac bypass. If hypothermia was of slow onset or prolonged, rewarming should be gradual and undertaken with care.

A cold diuresis can result in fluid loss and hydrostatic effects can exacerbate this in

immersion victims. These patients should be extracted and nursed recumbent to avoid causing severe postural hypotension. Cell membrane instability can result in significant ion flux, especially of potassium. Pancreatitis and rhabdomyolysis are also recognised complications.⁴

Pronouncement of death is difficult due to the appearance of the severely hypothermic patient.⁹ Patients should therefore be rewarmed before death is declared (the victim is 'not dead until they are warm and dead'). Very prolonged resuscitation may be required.¹¹

Conclusion /

Cold exposure can result in a number of injuries. However, with appropriate planning preventative measures can be taken to reduce the impact of low environmental temperatures. If hypothermia develops, it should be recognised and treated as soon as possible. Familiarity with management principles can reduce morbidity and mortality. am.

Alistair Simpson / former Medical Officer with the British Antarctic Survey

Alistair lived for more than 16 months in Antarctica. He served on a number of expeditions, including an unsupported ski crossing of the world's second largest icecap and two high altitude research expeditions in the Bolivian Andes.

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Avi / I just can't get warm. And it is probably another two hours to the top. I am going down, don't worry, I will be fine

Brad / It is a brave decision, keep radio contact every two hours

And with a tap of encouragement on his back, I was off back down the slopes. It took them another three hours to reach the summit of Spantik, at 7031m in the Karakorum and me about the same time back down to our highest camp.

That morning an early start had meant the snow was hard underfoot and made for fast climbing. The alpenglow had mesmerised us at sunrise and then the sun made its appearance. Now, though, on the summit ridge, we were being hampered by soft, waist deep snow and were being forced to dig a trench up the mountain to ascend. A slight wind was blowing and at nearly 7000m, this chilled us to the core.

Lagging behind the front two climbers, I was slowly making my way up, wrapped in my own psychological and physical battle against the elements. Any exposed flesh was literally freezing. My balaclava and buff kept the wind off my face, but were suffocating me, so I had to keep taking them off to breathe. My down jacket felt like no more than a cotton t-shirt and I had to alternate hands to wield my ice axe as its cold penetrated my gloves, even though I had taped the metal parts up. We had stopped earlier, to sun ourselves but nothing remained of that warmth. This was my first big mountain but between them, my two friends had both had forays up eight 8000m peaks and were far more experienced than me and more accustomed to the cold and the hardship.

Somewhere further up the slope, I stopped to wriggle my now partially numb toes and to rotate my arms. I looked up and saw a foot being warmed in an armpit! Snow had

been filling up the boot of the trailbreaker due to a loose boot. I waded up to them, rested and when we all felt better and the feet rewarmed, continued.

At that point, I had been going for about nine hours and had reached a personal high of about 6710m, a mere 300 m below the summit. However, despite my efforts and whatever I was doing, I could not get warm. My toes had gone, my hands were cold and every time I stopped, I would be shivering. I had no more layers to put on. Our leader, Brad, had graciously offered me another down jacket but now he was himself too cold to be without it.

I knew then I would not make the summit. I was exhausted and hypothermic. After a brief conversation with Brad and an exchange of encouragement, I started descending.

The decision to turn round had been a pragmatic one, without any emotion on my behalf. I might have been able to get up to the top, but probably not down again. I was hypothermic and I didn't want to get frostbite. Once I had descended the final slope back to camp, I had warmed up considerably and I sat down in the snow just above the tent. It was only then I willed up, as I realised what had just happened in all its intensity. It had taken six months of planning and training to get here and it was almost too much for me. However after just a few hours, warm and rehydrated, I was able to share the joy of my friend's summit success and had already started thinking of next time.

Words by Avinash Aujayeb, SpR in Respiratory Medicine
Photo by Brad Jackson, www.fieldtouringalpine.com



JAMES YATES

URBAN SEARCH AND RESCUE

Main image: Matt Wilkes / following images: James Yates



Urban search and rescue (USAR) conjures up images of rescue teams in brightly covered overalls crawling over rubble piles amongst scenes of devastation and mass casualties.

Worldwide, highly publicised disasters such as the terrorist attacks on the World Trade Centre, the tsunami in Japan and the earthquakes in New Zealand have helped to increase the profile of USAR teams and the awareness of what they do.

However, images of rugged looking personnel lifting victims proudly from the debris may be appealing to the media, but they hide the fact that urban search and rescue remains one of the most challenging and hazardous of the disaster response activities. Over time though, the ability to safely locate and extricate victims of these disasters has improved, with highly trained, multi-disciplinary rescue teams, equipped with the latest technology and equipment.

An equally advanced medical team, integrated into the rescue team, has also become vital not only to reduce morbidity and mortality in the victims of such events, but also to attend to the medical needs of the rescue team themselves. Medical staff require specific USAR training to

allow them to operate safely in the hazardous conditions but also to develop an appreciation of what can be achieved by the rescue teams and the timescales involved in effecting a rescue.

They also need to be highly adaptable in their approach to patient assessment and management in order to provide high levels of care in an extremely demanding setting. Altered techniques for standard procedures may be required, pathologies particular to USAR may be encountered and the dark, dusty and noisy environment will hamper the work of even the best trained medic.

COMMUNICATION AND THE ENVIRONMENT

Medicine though is not the only factor that needs to be considered in order to provide an effective medical response.

Prior to entering the collapse, many other important decisions need to be made, for example, the method of communication with other team members. Depending on the type of structure and the distances involved, many standard VHF radios used by the emergency

services will have limited use. Specific two-way communication equipment is available, utilising a long reinforced wire, but this has the drawback of being a bulky piece of equipment to drag into the incident and its range is limited by the length of wire available.

As the environment will typically be dark or certainly dull, a light source will be vital. In a protracted incident, portable lighting units may be brought into the situation powered by external generators, but in the initial response it is likely that the only light available will be from a personal head torch. Light sticks can also be used for several functions such as marking a route or to identify equipment.

Another important concern is air quality, as when a structure collapses large quantities of dust, insulating fibres and other debris are distributed into the air. Therefore dust masks should be worn by all rescuers to provide protection from these substances. Unfortunately they cannot be relied upon indefinitely as large concrete dust particles and significant quantities of exhaled water vapour from the heavily breathing rescuer will quickly clog the filters demanding a change. Additional masks will also be required for victims

of the incident during treatment and extrication.

Portable air monitoring equipment may also be necessary to detect a build up of dangerous gases, such as methane or hydrogen sulphide, or a reduction in the oxygen concentration of the inspired air. Gas monitoring is particularly important when working below ground level where gases denser than air can sink and settle.

MEDICAL EQUIPMENT

Finally, a decision is required regarding the content of the medical kit. This is usually of no concern during a prehospital event, when popping back to your vehicle presents no problems, but in USAR access may be via a narrow breach, crawling through a passage or being lowered down a shaft. Excessive kit is not an option but neither is leaving the patient to return outside for forgotten items, so prioritisation of appropriate items is essential.

Standard equipment is often not suitable for use in this environment due to its fragility, weight and bulk. Specialist items may be utilised during patient assessment and management, but often ►



the medic will have to rely on manual techniques and clinical judgement alone. An appreciation of the patient care interventions that may be necessary, or can successfully be carried out, will probably dictate to some extent what assessment tools will be carried. Arguably, the assessment kit could be reduced down to a sphygmomanometer, blood glucose monitor and a stethoscope.

PATIENT ASSESSMENT

As well as using limited technical equipment, the medic can be faced with some unusual patient presentations which demand an adaptive approach to patient evaluation.

Imagine a patient who is trapped behind a pile of debris and only their arm is accessible. Can the entire patient realistically be assessed? Probably not, but an estimation of their gross physiology is possible. A simple squeeze of the hand and receiving a squeeze in return will tell us their level of consciousness as a start. The skin colour can be inspected for signs of cyanosis to indicate their respiratory status, a palpable radial pulse estimates blood pressure and this combined with

the heart rate and skin texture gives an idea of the patient's cardiovascular status.

It is a crude and basic assessment, but adapting to what is presented is the key challenge to successful USAR medicine. Sometimes even physical contact with the patient will be a luxury and assessment may have take place via a camera or remote microphone lowered through a void which is too small for human access. Once again, the thoroughness of an assessment is mainly limited by the medics' imagination.

PATIENT MANAGEMENT

When patient assessment has been completed the management phase can begin, and this too may not be as straight forward as expected. The dark, cramped conditions may demand adapted techniques to standard interventions or the use of alternative procedures altogether.

Interventions such as gaining vascular access normally present only limited difficulties, but finding a vein using the light from a headtorch when the patient is shocked, cold and dirty

may prove very challenging. The availability of intraosseous equipment in this situation can prove to be essential, as identifying the landmarks for IO access can be much simpler and the likelihood of successful vascular access far higher.

If endotracheal intubation is required and there is not enough room to proceed past the patient, then face-to-face intubation using the pickaxe method may be necessary. If the vocal chords cannot be visualised using this technique then digital intubation may be attempted. Here, the index finger and middle finger of the left hand are slid over the surface of the tongue until the epiglottis is palpated. The ET tube, held in the right hand, is then passed between the fingers and guided into the trachea. It may sound bizarre, but if this is the only way to secure the patient's airway then it can be a life-saving procedure.

Specialist equipment may also assist in the effective care of the patient. Many will present with significant bleeding and there are numerous options available. Tourniquets have had a resurgence in prehospital care and are proven to decrease mortality in the

setting of uncontrollable bleeding from a limb. Haemostatic agents, whether in powder form or impregnated into gauze, can assist with stopping major bleeding from the torso where placement of a tourniquet is impossible.

Pelvic splints are also available which will stabilise a fractured pelvis during the inevitably bumpy extrication, though improvisation with a blanket wrap is also possible. Malleable splints made with a thin layer of metal surrounded by foam are extremely versatile and can be used to stabilise ankle, leg, wrist and forearm fractures as well as acting as an improvised cervical collar. These fit very well into the category of "adaptable equipment" and as such have proved to be very popular in USAR.

Alongside standard traumatic injuries which are dealt with on a daily basis in emergency care, there are some less common presentations which may be encountered in a USAR incident. Crush syndrome is the most significant cause of morbidity and mortality in patients after successful rescue from entrapments and, as such, the medic needs to be familiar with its treatment and be very aggressive with the management ►

of these patients. Prolonged entrapments also increase the likelihood of compartment syndrome, dehydration and hypothermia.

RESCUING THE RESCUERS

Injuries are not just isolated to victims of these disasters however, and rescuers may also present to the medic with unique demands. Though limiting the time using breaching equipment is strictly enforced, hand-arm vibration syndrome is a risk for rescue workers and, as many of the power tools in use at an incident are hydraulic in nature, high pressure injection injuries may occur. These can appear innocuous, with only a small surface puncture wound, but there may be significant sub-dermal damage and the development of severe pain.

Rescue workers are also a multi-disciplinary group and the medic may find themselves dressing the wounds of the rescue dogs as well as their human counterparts.

THE FINAL WORD

The final word on USAR operations needs to be one of realism. In a major incident with large numbers of casualties, not all patients will be treated in the optimal fashion and not all will be salvageable. Difficult decisions will need to

be made both with regard to patient care and resuscitation decisions. If a patient is trapped and deteriorating, with the chance of rapid extrication slim, and numerous other patients awaiting your attention, what would you do?

The medic is also not immune to damage and crawling around in the dirt, breathing dusty air and working in hot, cramped spaces can lead to dehydration, heat exhaustion or contraction of infectious diseases. The psychological aspect of this work should also not be underestimated. Extended periods of time may be spent with a patient, in close quarters, during a significant and extraordinarily frightening episode in their lives.

The medic may also be scared and in extreme danger but is still expected to provide advanced care in some of the most difficult situations imaginable, with limited equipment and on their own.

Urban search and rescue is therefore a unique and dangerous environment in which a medic can choose to work. The multitude of challenges that may be faced demand physical, professional and psychological resilience along with an adaptable and inventive approach to patient care. But to overcome all the adversity to be that rugged rescuer pulling a victim from the rubble and smiling for the cameras makes it all worthwhile. **am.**

James is currently working as a paramedic for St John Ambulance in Christchurch, New Zealand where he has also spent time training with one of the Civil Defence emergency response teams; prior to this he was a specialist USAR and CBRN paramedic with one of the Hazardous Area Response Teams in the UK.

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A Year on South Georgia

In October 2010, Sam Crimmin left the UK to work with the British Antarctic Survey on the island of South Georgia. She embraced this wild environment, learning photography and making some truly wonderful images. In this Adventure Medic portfolio section, we present some of our favourites. For more of Sam's work, please visit www.samcrimminphotography.com.

South Georgia is a small mountainous island in the sub Antarctic. Though its latitude is equivalent to the North of Scotland it lies within the Antarctic Convergence and as such experiences a polar climate. It is accessible only by sea.

South Georgia was discovered in 1745 by Captain Cook. He wasn't impressed. He described the land as 'savage and horrible' and went as far as to name its Southern end as Cape Disappointment after turning the tip and realising he had not

discovered the sought after Seventh Continent. The British Antarctic Survey and the Government of South Georgia run two small outposts on this otherwise uninhabited island. The largest of these is at King Edward Point in Cumberland Bay.

Also in Cumberland bay is the abandoned whaling station of Grytviken. In 1914 Sir Ernest Shackleton set off on his ill-fated Imperial Trans-Antarctic expedition from this port. In 1922 he died on the island and is now buried in the Whalers' graveyard.

As the islands doctor the medical workload is not onerous. The permanent population peaks at 40 in the summer and reduces to 12 in the winter. In the summer the majority of the workload comes from the tourist industry and in the winter from the fishing trade.

To make up for the lack of patients, the island's doctor becomes an apprentice in all trades. I hiked over hills and skied up and down peaks to collect science samples. I weighed penguins and fur seal pups. I drove boats, learnt to bake bread,

sold stamps and ran a post office. I went on a two-day holiday on a Royal Navy Type-42 destroyer. I learnt photography. I met some amazing people and was fortunate enough to spend a year in a very special place.

South Georgia has had a lasting impact, I can say with confidence it is truly one of the most incredible unspoilt wildernesses on the planet. If you ever get to the opportunity to visit, jump at it. I return in Jan 2013.













Astrophotography

Some of the most spectacular photography from Sam Crimmin's portfolio are her images of the night sky. Here, Sam has given us a beginner's guide to how to make your own. Her tips will be most useful for those with SLR cameras and a grasp of the basics of photography.

A trip into the wild usually means fantastic scenery but how often do you look up? Even in the middle of the night there is far more to see than the tent ceiling. Away from light pollution the night sky can be spectacular. During 18 months in the Antarctic I tried to learn how to photograph it.

What I discovered was that astrophotography takes a bit of practice and a lot of patience. But get it right (and I'm not saying I have yet) and the camera can pick up some amazingly detailed starscapes.

These are my top tips for nighttime landscape photography.

Location and time of year /

Pick somewhere dark! The further away from

natural light the better. On South Georgia I was 900 miles from the nearest city. Avoid moonlight unless you are aiming for star trails.

Winter is better. In the winter the sun dips further below the horizon but in summer time the camera will pick up its light even if the naked eye cannot.

Type of Camera /

Astrophotography will only really work with a digital SLR as it requires a good deal of fiddling with the settings. Also, the lower the camera noise the better the images. Mine were all taken with a Canon 5D MKII full frame SLR.

As the exposure times will be long you will also need a sturdy tripod.

Setting up the shot /

If it is too dark to see through the view finder I put the ISO right up (25,600 on my camera) and take a few test shots, then use the LCD image to adjust the camera position. By increasing the ISO a test shot can be captured in 4-5 seconds rather than 30s saving both battery and time.

Choosing the settings /

The f-number will depend on your lens. My night sky pictures were taken with a Canon 17-40 L f4 on a full frame body. Most lenses work best when stopped down a bit, therefore for me f5 or f5.6 seemed to work best.

If you are lucky to have a faster lens you can decrease the f number. I have managed to get some good images with the lens at f4 and this may be necessary if it is a very dark night. It's probably better to go to f4, before heading above an ISO of 3200.

Focus /

Most cameras are set up to automatically focus, but at nighttime this won't be possible. Instead, manually set the focus at infinity then come back just a little, as most modern lens actually go past infinity to allow the autofocus to work.

Once you have done this take a test picture and then use the LCD screen to zoom in on a star. Adjust the focus in fine increments until the image is sharp. Once you have done this a few times you will learn where the best focus point is. Take your time doing this as it's the most important bit to get right.

Length of exposure /

The closer you are aiming to the pole star (Southern or Northern!) the longer exposure you can use. That said anything over 30 seconds and you will start to get too much



star trailing. This can be an issue, as if you shorten the exposure then you will need to up the ISO.

Star trails /

Star trails are created as the earth's movement gives the impression that the stars are spinning through the sky. A long exposure, 90 minutes plus, can create a star trailing effect. This is best achieved on a moonlight night as it allows the camera to capture the detail of the landscape as well.

An alternative to a long exposure is to use an intervalometer. My picture of the star trails over the Harker glacier was actually a series of 175 x 30 second exposures (ISO 1600 f5.6) superimposed. Using this technique it is possible to take out any frames that might ruin the image, for instance someone ▶

leaving the tent to pee!

For PC users there is a brilliant program at www.startrails.de. I have not yet found a Mac equivalent but Photoshop can be used to the same effect. It would take a lot of writing space to explain the details of post-production here but a good website for more information is www.astropix.com.

The moon /

Two words: spot meter! The moon is extraordinarily bright in a very dark sky. If you have your camera on Evaluative Metering you will never get any detail.

To increase the crispness of the shot use a remote to activate the camera and switch off image stabilisation. This may seem counter-intuitive, but with a camera on a tripod the lack of movement can confuse the image stabilisation and add shake to the image. Using the mirror lockup feature may also help increase crispness.

Some example settings /

Dark Night		
Dark nights are best for Milky Way detail, try to get the ISO down if you can.		
ISO	Aperture	Shutter Speed
3200	F5	30 secs

Moonlight		
If there is a lot of moonlight you won't get good milky way images, so maybe try star trails instead?		
ISO	Aperture	Shutter Speed
1250	F5.6	30 secs

For more of Sam's work, please visit: www.samcrimminphotography.com

The Full moon image in this article was taken by Alastair Wilson, BAS Scientist. He has his own excellent photography blog at: <http://alastairwilsonphotos.blogspot.co.uk>

am.





Manaslu is 8156m and is the 8th highest peak in the world. The 'Mountain of the Spirit' is located in the Mansiri Himal in the Nepalese Himalayas. Whilst this is not the most technical 8000m peak, it is increasingly gaining a reputation as being one of the more hazardous.

Paddy Cave was an expedition leader on the mountain this year and gives us his account of the 2012 Manaslu disaster where a massive avalanche killed 13 people and injured many others. For Nepal this was the worst mountaineering disaster since 1995.

“ Camp 3 is gone... maybe 30 people were there, there are some dead I think...”

I sat in the porch of my tent, already the sun was up - the weather was clear and still. As my eyes adjusted to the light I gazed at the mountain and the area where Camp 3 lay at about 6800m. The massive wall of seracs (hanging glacial ice cliffs) on the skyline of the summit ridge had changed, there was a section missing that was so big it was hard to comprehend and the crown wall of the slab avalanche it had triggered below was easy to pick out in the slanting early morning light. It was massive, perhaps the width of

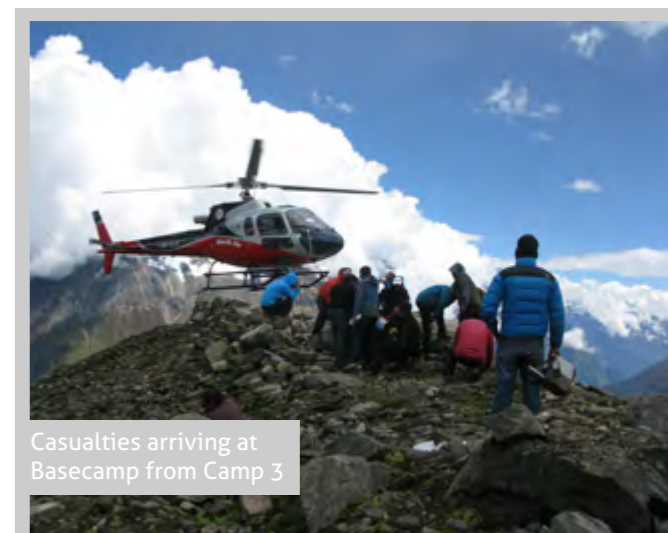
six football fields, the track could clearly be seen and through my binoculars I could see figures moving about and the track of debris stretching down to the area of Camp 2. Looking up to where Camp 3 should be, there was nothing.

I sat looking at the mountain. It was not clear exactly how many people were at Camp 3, reports were coming down, English, French, German and Nepali, I couldn't catch or understand everything that was being said, but the tone said enough... These snippets coming from the radio painted a picture of devastation at Camp 3.

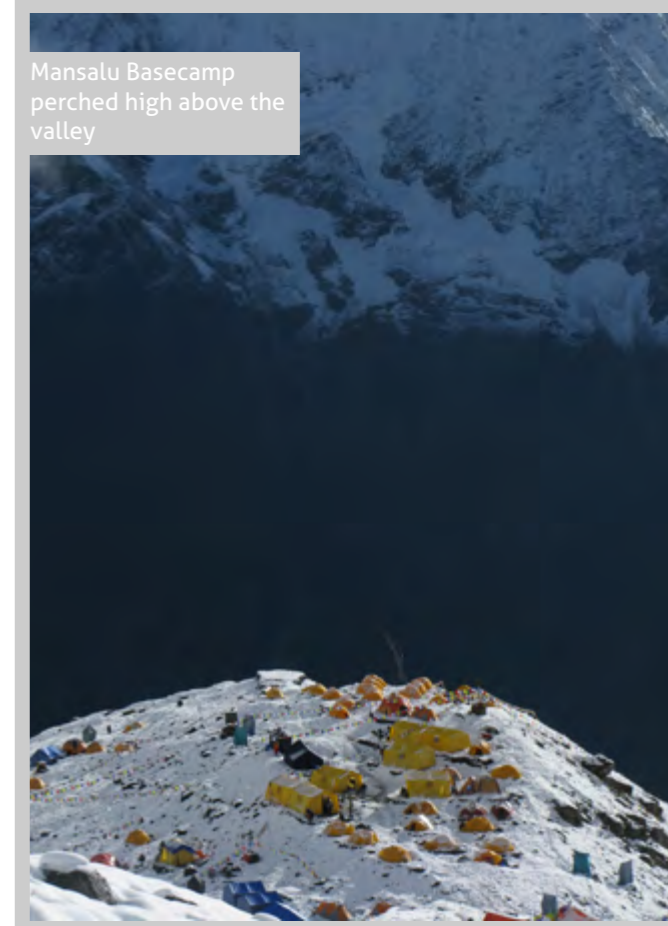
The scene of the accident was probably only a few kilometres away and was in clear view, however it was easy to let the distance and radio relayed correspondence create the feeling of separation, that this was not happening right in front of us. The journey to the scene of the incident could be completed in a day by the well acclimatised and fit, but might take 3 for some. At Camp 3 it was different. People were struggling for life, some had already died and there were many injured, for the people up there it was real, it was happening. Probably for those at the scene the reality was equally surreal, but in a very different way.

As the day progressed the picture was becoming clearer but the number of those involved was unclear. The helicopters arrived from the valley and the casualties were evacuated to BC while the more seriously injured were flown straight to the valley base at Samagaon ready for transfer to Kathmandu. At BC a makeshift treatment area had been created, many of the larger expeditions, including ourselves, had brought down stretchers, oxygen and medical supplies to the heli pad.

Thinking back to the heli pad it is interesting to see how different people react to such events. There is no Mountain Rescue present, no one is 'in charge', so its very much a case of people stepping forward and getting stuck in. Whilst some will naturally



Casualties arriving at Basecamp from Camp 3



Mansalu Basecamp perched high above the valley

step forward, there is always others who will wait until directed, and others again who will feel they are going to be in the way, or perhaps don't want to go to the site as they feel it is inappropriate when there are casualties and worse. However it panned out, I must say it seemed to work. To me it was an example of strangers with a mutual interest pulling together and using their common sense in what is a confusing situation. ▶

At the heli pad I met Pasang, a Nepali Mountain Guide, he was taking a central role in coordinating a Sherpa rescue party and after a brief chat I picked up my mountain kit and put on my high altitude boots. It wasn't clear whether anyone was going to need to be flown up as extra help but I figured that if I was ready it could be a help. My team had been to Camp 2 and higher so I felt I was acclimatised to the height of the incident and could be useful, most others who had been to that height already were involved in the incident.

It was whilst waiting at the heli pad that the reality of the situation struck me more deeply. Whilst I recognised many of the faces of injured climbers coming off the helicopters from the 10 day approach walk and evenings spent in various tea houses along the way, it was the arrival of the body of a Sherpa that struck deeper. I had heard that 1 Sherpa had been killed, but it was only now that it was confirmed as Dawa Sherpa from Pangboche in the Solukhumbu. Dawa was a friend of mine and had spent 5 weeks with me the previous year working on Mera Peak and Baruntse. Dawa had visited only days before and was full of life and enthusiasm, it was hard to connect

that person with the body wrapped up in the sleeping bag. His brother was also there, his agony is only a clue of what it must feel like to lose a sibling and in many ways it leaves you, as an observer, shocked, 'what can I do or say?' One thing was clear, we were very lucky... and that's all it was... 'luck'. This was not the kind of avalanche that could be easily predicted, there had been a lot of snow on our arrival

“ We were very lucky and that's all it was... luck. ”

but it had generally stabilised. The avalanche was caused by the serac collapse. Historically this serac barrier had not been an issue as far as I know - it clearly threatened the route but had never proved unstable and was simply accepted as one of the many objective dangers on the mountain. Previous accidents had occurred on the long exposed traverse between Camps 1 and 2 and it was this area that had a particular reputation for being ▶



“Where there is light, there is always shadow”



accident prone.

So when we arrived at Camp 2, on one of our load carries we felt relieved to be temporarily out of the very exposed section below. The day had been hard with equipment being carried up to leave on the mountain for our later summit attempt. The team were tired and feeling the effects of the altitude. Plan A was to move to Camp 3 the following day and sleep, then return to BC for a good rest.

On waking though one team member was not feeling good, an overnight headache had worsened and was causing an issue. A headache at altitude must be taken seriously, it can be a symptom of Acute Mountain Sickness (AMS) and can't be ignored. The Sherpa team were keen to continue with the load carry to Camp 3, and since they were well this was a good idea to put us in the best position for the future summit attempt. One team member who felt OK was keen to accompany them for her own acclimatisation.

So we agreed that they would do the load carry and I would stay with the other unwell member. The plan was to get some fluids into the unwell member and get up and about and see if there was any change to how he felt. Fairly quickly it was clear we needed to descend, he felt no better. At this stage I was concerned about High Altitude Cerebral Edema

“ We were 'meant' to be at Camp 3



Load carrying to camp 3 the day before the avalanche.

(HACE) and was keen to move down with the member in time to descend all the way to BC. Some medication was taken but descent was the best cure for possible AMS so it was decision made. I radioed the rest of the team, after a short discussion the decision was made that once the load carry was complete to Camp 3 that they would all descend back to BC also.

Back at BC, the headache was improving. The others arrived later in the evening and we all went off to get some sleep after a reasonable day. I drifted off to sleep hoping that the lost night sleep at Camp 3, where we should be now, wouldn't effect our acclimatisation too much but was happy to see the member looking better. It was 4am the following morning that the avalanche struck.

Looking back on Manaslu one thing comes to mind over anything else, my team and myself were very fortunate. We were 'meant' to be at Camp 3. The fact that a headache changed the course of things for me and my team will always be something that is hard to fully

comprehend. Its hard to take in that such a small thing could have altered the course of events so significantly for our team, our families and friends.

Another thing that comes to mind is the slight irony of the situation, all year there had been no one there at all, that day people arrived. The next day on the other hand, there could easily have been twice that number there. Tibet had closed for expeditions this year and many trips had diverted to other options, Manaslu being a logical substitute for Cho Oyu (8201m) was very busy with 34 expeditions on the mountain.

A quote I remember says, 'where there is light, there is always shadow'. It often comes to mind when I'm in the mountains and reminds me that many of my most memorable experiences are the ones that ventured close to the 'shadow'. Sometimes it will be our own error that will push us too close to that division, but other times, as with Manaslu, its out of our hands. am.



By Nell Anderson



Nepal Mountain Medicine Course

Words and images by Tom Buckman / Staff Grade in Emergency Medicine

South West Devon is not renowned for its prevalence of acute mountain sickness, so convincing the powers that be at Torbay Emergency Department that a mountain medicine course in the Nepal Himalayas would be a valuable use of my study leave was a challenging task. However, after some enthusiastic words on trauma, teamwork and communication skills I received the green light and set about gathering the contents of a seemingly never-ending kit list.

Before I knew it I was in bustling central Kathmandu ready to meet a trekking group from all corners of the globe. After a couple of days acclimatising and valuable teaching on the important considerations of pre-expedition planning, we were in a single propeller plane destined for the most exhilarating landing strip any of us will ever encounter at Lukla, altitude 2800m. The excitement was palpable as we set out at the start of our trek to Everest base camp, and the following two weeks exceeded all expectations.

Logistics /

My main concern prior to applying was a lack of experience at altitude, but I was pleased to discover that this had no bearing on eligibility, and in fact the majority of the group had never been to altitude before. Booking was a simple matter of accessing the Expedition and Wilderness medicine website and signing up. This can be done at any time leading up to the course as long as there are places, but obviously the earlier the better to give you time to gather kit, get vaccinations and hopefully get the cheap flights.

The course ran from October 22nd to November the 8th and cost £2795 in total. Although initially seeming expensive, this fee included all accommodation and food on the trek so there was little extra spending money required apart from for copious amounts of tea and apple pie at the charming local bakeries. Additionally a significant proportion of the profits from the expedition go towards

supporting the work of Everest ER, which provides vital medical care to the hundreds of incredible climbing Sherpas that work in the area each season, as well as for the many visiting trekkers.

The leaders and course content /

It was a privilege to gain knowledge and skills on both mountain medicine and broader aspects of expedition medicine from three enthusiastic and inspiring doctors with a huge amount of experience and expertise in the field. The presence of Dr Luanne Freer, the founder of Everest ER, as one of our leaders gave us the chance to gain a unique insight into the realities of working at altitude in the Himalayas.

Most days involved between six and eight hours trekking and ended with a couple of informal and interactive lectures on a wide variety of subjects. Particular attention was paid to the recognition and treatment of acute mountain sickness, high altitude cerebral oedema (HACE) and high altitude pulmonary oedema (HAPE), whilst other common presentations encountered in mountain medicine such as frostbite and hypothermia were covered in detail.

Additionally there was a wealth of teaching on subjects applicable to wilderness medicine in general including back country medical kits, water disinfection, trauma care, wound management and even wild animal attacks. Of most use was a day of simulated mountain rescue scenarios which helped to consolidate much of the theoretical knowledge gained whilst giving a real feel for the challenges and important factors to be aware of when co-ordinating a mountain rescue.

The Trekking /

Words and even pictures cannot do justice to the incredible natural beauty and sheer enormity of the Khumbu valley and the Everest range. It is not often that I contemplate the

prospect of a 6.30am awakening with pleasure, but every day began with the excitement of what the day's trek would bring and never disappointed. It was fascinating to learn about altitude related illness while experiencing and dealing with early symptoms yourself, as well as meeting other trekkers along the route who were struggling with the effects of altitude and needed help. There's nothing like learning on the job.

The Locals /

By staying in tea houses the friendly, fun and accommodating nature of the mountain communities was really evident, and made for another rewarding part of the expedition. It was impossible not to become immediately attached to the generous locals, and in particular to the team of incredible Sherpas who were primarily responsible for our safe passage up the Khumbu valley but quickly became an integral part of the group and good friends. Whether leading from the front, helping those at the back, or serving up culinary delights the Sherpas were forever smiling and ensuring most importantly that everyone enjoyed the journey. It was a true pleasure to spend two weeks with them in their mountains.

Final words /

Having had time to reflect, I still find myself struggling to think of anything but positives regarding this trip. As an educational opportunity it was outstanding, not only in the field of mountain and expedition medicine but also covering so many generic skills that are fundamental qualities of a competent medic. It has given me far greater insight into the opportunities available for those motivated to do something different and exciting with their careers, whether at altitude or within any of the many other branches of adventure medicine. [am.](#)

For Mountain Medicine and other courses visit www.expeditionmedicine.co.uk



Diploma in Mountain Medicine

Words by Sav Wijesingha / Registrar in ICM, Image by Matt Wilkes / Editor

Imagine a post-graduate diploma that encourages you to do more of your hobbies, meet interesting and like-minded people and go on location to be taught on a mountain, rather than a classroom?

Looking for a qualification that will put a bit of oomph behind those applications to be an expedition medic?

The Diploma of Mountain Medicine (DiMM) offers just that. Run by the University of Leicester, it is aimed at medics interested in expedition, travel, remote, rescue and high altitude medicine. It consists of four residential weeks, two question papers and three written submissions. The faculty include some of the most eminent figures in high altitude medicine, top mountain guides and those at the forefront of mountain rescue.

The modules /

Two of the residential weeks are based at the UK National Mountain Centre at Plas-y-Brenin

in North Wales. Although these are 'Theory' weeks and are followed by test papers, there is still time to get out and about. A great deal taught out on the hill, or for that matter, in the dark or in a river! There is some assessment, including night navigation during these weeks, but the faculty is hugely supportive and there is ample time to brush up on your skills with the experts. There are sessions run by the local search and rescue team, scenarios and the opportunity to gain practical skills such as basic expedition dentistry.

The remaining two weeks are the 'Skills' modules, which is where the fun really starts. The first of these is the Scottish Winter module, based at Fort William. This covers winter climbing skills as well as avalanche awareness and rescue. If you are a keen skier or a snowboarder, this is also hugely useful for personal safety off piste.

The final module is Alpine Skills, run from Arolla, in the Swiss Alps with some of Europe's most experienced mountain guides. This is the chance to put everything learned during

the Diploma into action. The week consists of examined medical scenarios and assessed rescue techniques, practicing glacier travel and safe climbing, as well as some time to bag a summit or two. Successfully rescuing your course buddies from a crevasse is an excellent way to forge new friendships - just don't drop them!

The people /

As well as being an opportunity to learn a great deal of interesting and useful stuff from leaders in their fields, this diploma is above all a chance to mix with people who think the

same as you – that medicine is an opportunity for adventure, that there is so much out there to see and do, and that the most interesting people take the road less travelled during their medical training.

The details /

The Diploma in Mountain Medicine starts every December and is run by the University of Leicester. Contact them via dipadmin@medex.org.uk. The diploma is expensive, does not include accommodation costs and the fee fluctuates from year to year. Think in the region of 3,500 pounds. [am](#).



Andreas Busslinger / Busslinger Fotografie
www.andreasbusslinger.ch



Student Wilderness Medicine Conference Photography Competition

The organisers of this year's Student Wilderness Medicine Conference, in partnership with Adventure Medic are pleased to present the winners of their joint Student Photography Competition. We were inundated with entries this year, all of a very high standard and all available for viewing on our Facebook page.

The winners were judged by the Editors of Adventure Medic and the comments are from our Design Editor, Matt Wilkes. Many congratulations to our top four photographers: Christopher Tomlinson, Marcus Stevens, Colin Macalindin and Rohan Goel and keep sending us your images!



#4 Tibetan horse-racing at Harvest Festival Mustang District, Nepal / Christopher Tomlinson

"We liked the skill here. Chris has managed to get the horses sharp while keeping a nice motion blur in the background. The expressions on the riders' faces add to the joy of the image."



#3 Enjoying a coke after a long day hiking in the Pyrenees / Marcus Stevens
"We liked the composition. The foreground, midground and background, as well as the silhouetted figure all fall on the magic 'thirds' and the image is skilfully exposed."



#2 Steph Davies on Take-off / Colin Macalindin
"We liked the palpable sense of adventure. The incredible setting, as well as the decisive moment of jumping made this an arresting image."



#1 Untitled / Rohan Goel
"We liked the sense of epic scale. The wonderful lenticular cloud towering over the ant-like figures in the foreground beautifully conveys the majesty of the mountains."



Altitude Research Elective in Nepal

Mike Freeman / 5th Year Medical Student, University of Glasgow

This summer I heard the tragic news that fourteen climbers were killed in an avalanche on July 12th on Mont Blanc. Roger Payne, amongst them, was a widely respected mountain guide and accomplished climber whose death shook the mountaineering community. Whilst working in Switzerland in the summer of 2009, I was lucky enough to learn from Roger first hand on a climbing trip that he guided. Of his many stories and anecdotes, his sagacious advice to “live life like a thrown knife,” remains my favourite. His thirst for life and adventure was truly contagious.

Returning to the UK feeling inspired by Roger’s stories, I made contact with the Mountain Medicine Society of Nepal (MMSN) and had my first experience of Nepali friendliness. It came as a warm reply to my e-mail, from the secretary, offering assistance with my research project. Instead of politely explaining to them that I hadn’t really intended to do any research, the seed had been sown and idea for a project soon began to develop into a reality.

Following a series of emails and internet searches, I discovered that the burden of altitude-illness in the Himalayas is substantial, despite recent improvements in safety and knowledge in ‘Western trekkers.’ Every year around half a million religious pilgrims from Nepal, India and China also ascend to altitude sites scattered throughout the Himalayas. Unlike trekkers, awareness of altitude sickness is low, adversity is often favoured and turning back is not even considered! Pilgrims, seeking enlightenment, forgiveness or cure, are at great risk of suffering the progressive and life threatening forms of altitude illness. In August, during the annual Hindu festival of Janaipurnima, around 20,000 determined pilgrims ascend to a high altitude ‘holy’ lake in the Langtang region of the Nepalese Himalaya. This pilgrimage and its pilgrims would form the basis for my research. I set out to study the unique risk factors for altitude-illness in this highly susceptible population.

Kathmandu /

After months of planning I arrived in Kathmandu, Nepal’s capital city. The taxi ride from the airport was a wholly disorientating experience. The smells and choking fumes, the deafening Suzuki’s car horns and the cows lying in the middle of the frantic, potholed road took me by surprise. For some reason, despite all my planning, I hadn’t prepared myself for any of this.

With ten weeks before the festival began, I had some time to explore. I got my first glimpse of the mountains on a trek in the Annapurna mountain-range. With eight out of the ten largest mountains in the world tucked within its borders, Nepal has some of the most beautiful and dramatic scenery imaginable. Unwilling to leave the hills, I spent a fortnight in a community hospital, where I got my first experience of obstetrics and surgery. Soon after, on a kayaking trip on the monsoon flooded Trisuli river, I found myself hitching back over the mountain pass to Kathmandu with my guide, sat in our kayaks on the roof a lorry. It wasn’t your average journey! Once back in the capital I began work in the Kathmandu Model hospital. The department I worked with travelled to remote areas in Nepal to run fortnightly surgical camps, setting up temporary operating theatres.

Village Life /

After a month, I escaped from the city to a small village north of the Kathmandu valley. I stayed with a very hospitable Nepali family and I helped out at the local Health Point having a more authentic Nepali experience. Without any trained medical staff present there I tried my best to help, but often struggled with my limited knowledge of the Nepali language. In the afternoons, I visited the local secondary school where amongst other topics I was asked by an embarrassed head-teacher to teach sex education. One of the classes ended in a disaster, when a student drew the male sex-organs on the white-board unwittingly with a permanent marker



pen. As amusing as his drawing was, it was a little awkward explaining this to the head-teacher. After a few weeks I was incredibly reluctant to leave this village where I had been so welcomed, but departed with two Nepali medical-students to the north of Nepal to begin my research.

The Research /

The dirt road that winds its way along precarious cliff edges towards the start of the trail was a little unnerving. The abundance of abandoned, dilapidated buses at the valley bottom served as a reminder of the hazards of this journey. Sat on the roof of the overcrowded bus as it rocked from side to side, I managed to convince myself I was in the ideal position to jump off should I need to. The relentless monsoon rain that falls on Nepal during the summer months means a number of landslides annually dissect this road and require a crossing by foot.

After just ten days at altitude we were able to complete the study successfully and collated data obtained from 170 of the pilgrims. This data nearly perished as a co-investigator accidentally knocked his rucksack off the edge of the path- which then tumbled down the hillside. Covered nearly head to toe in leeches, we eventually recovered the rucksack with the kind help of the locals. The subsequent bus journey back towards the capital city continued late into the night. The road had disintegrated under the tracks of the countless buses during the festival period, but fortunately the darkness concealed the exposure and helped ease the sense of impending doom.

The return flight to the UK was a memorable one; not least because of the awesome views of the Himalayan peaks finally offered as we climbed above the monsoon clouds. For the past few months, I had become totally absorbed in the life I had in Nepal; I was returning to what seemed like a strangely 'foreign' home. I found myself reluctant to be leaving behind all the negotiating, the laughter and the daily adventures Nepal had provided.

There and back again /

As I settled back into my medical rotations it didn't take long before I began to feel restless and start to think what I could do next. I knew a team based at University of British Columbia, Vancouver, who had also worked at this festival previously. After making contact, we began working to develop a protocol for a large-scale longitudinal study. We sought to collect enough genetic data for a Genome Wide Association Scan for altitude sickness. I also considered the use of ultrasound to detect cerebral oedema and so liaised with an Emergency Ultrasound Department in Boston, Massachusetts to include an ultrasound study as part of the project.

Before I knew it I was leaving the UK again for my senior elective. First in Boston, I collected the ultrasound probe and received training on its use from the A&E department at Massachusetts General Hospital. To my dismay the device began malfunctioning. With little time before the festival I eventually managed to fix the problem with a tenuous DIY ultrasound repair.

Arriving in Kathmandu, we discovered that ethical approval had somehow still not been processed. To complicate matters the entire team were, for some reason, unable to withdraw money and the local Health Board was now refusing permission for us to continue with the research plans. After three days of countless taxi-rides, official meetings and cups of dubious sugary-tea, we were fortunately given the official stamp-of-approval. We met with the two Nepali doctors and two medical students from the Mountain Medicine Society of Nepal (MMSN) who would be helping us with the study and we were finally ready to begin our research.

We had organised jeep transport this time, but still found ourselves crossing a worrying landslide by foot. After a series of near misses with the constant rock fall, we were relieved to make it across in one piece. Four members of the team were based at the start of the trail and five of us based at the lake at 4380m.



We provided roti and other snacks to entice volunteers and a large poster made by locals drew more attention to our base. The poster needed some prompt alteration as it initially read "free poison"! The days were long, starting at 04:30 and busy usually until 23:00. We collected demographic information, buccal genetic samples, baseline balance information, heart-rate, blood haemoglobin and oxygen saturation and finally exhaled carbon monoxide and nitrous oxide. At high camp we worked along-side the Himalayan-Rescue-Association who run a temporary health camp during the festival. We collected altitude illness information, saliva genetic samples, ultrasound scans, balance (ataxia data), heart-rate and oxygen saturations.

A further translation error nearly landed me in bother when I was advised by an amused porter that my pronunciation of the Nepali word for bracelet was in actual fact the word

for vagina! My attempts to find our identifying red bracelets for follow ups were soon halted and he kindly offered to take over from there on.

Additional members of our research team joined us at the lake for the busiest night of the festival to provide extra help in all the chaos. Amongst the pandemonium of sick pilgrims who arrive in their masses, there are very scant toilet facilities, limited accommodation, monsoon rain and of course a festival of music, alcohol and dance. Eight of us shared a double-bed sized room and on the busiest day I spent the night in the health camp hoping to examine sick pilgrims with the ultrasound. Once again the research was a great success. In all, we managed to collect longitudinal data on 567 pilgrims (95% of those recruited by the low altitude team!) and a further 96 sick pilgrims at the lake.

During the festival period I also gained great experience of wilderness medicine, where resources were minimal. I remember my alarm as a lady sat conscious with an oxygen saturation of 29%; the lady lying next to her with severe pneumonia was in greater need of the oxygen at that time! Patients sometimes required urgent evacuation down the mountain; which would involve being carried on the back of a porter, along with an oxygen cylinder, often in the middle of the night. It was a horrible reminder that unlike trekkers, these pilgrims could not afford the insurance needed for helicopter rescue and as such death was a distinct possibility.

Final words /

Shortly after returning home to the UK I was admitted to hospital and treated for Typhoid fever. Nepal has made its mark on me; I have also had Giardia, food poisoning and a lot of diarrhoea; but aside from all that, I have

experienced some of challenges of field research, I've been awed by the mountains and humbled by the generosity and kindness of the people. In many ways this has been pilgrimage of my own during my medical school years. In the niche world of altitude illness research and expedition medicine, I have experienced a sense of responsibility, purpose and adventure that has shaped my future ambitions. It is strange now, to think, how much resulted from the kindness and slight misunderstanding of that first email. There is a famous Nepali saying 'khe garne?' which translates as 'what is there to do?' Well in my opinion Roger saying covered it pretty well:

"Live life like a thrown knife"

I am hugely grateful for the support and help I have received during these projects both in Glasgow, Boston, Vancouver and Nepal and to the organisations that provided me with essential funding and research equipment. **am.**

Destination / Nepal
Time of Year / June- August
Weather / Monsoon season, plenty of rain and clouds, but mountain tops can still be seen early in the mornings!
Religion / Hinduism and Buddhism
Money Spent / Flights roughly £500. Daily living costs will vary (approx. £5-10)
Vaccinations / Hep A/B, TB, Rabies, Typhoid, Japanese Encephalitis (optional)
First Aid Kit / Alcohol gel, Rehydration Sachets, Antibiotics, Paracetamol

Positives / Diversity of scenery and landscape; Potential for adventure with outdoor pursuits; Cheap living costs

Negatives / Things often don't go to plan- be prepared to be flexible; The clouds, leeches and landslides might worry some, but remember the monsoon scares away most tourists and makes for a more authentic experience of Nepal

Placements can be arranged very easily once you have arrived in Nepal if things don't work out as originally planned. Bear in mind that as you move to a smaller and more rural setting less English is spoken, but there is often more scope to get hands on experience. It is a great experience to spend some time living with a Nepali family but it can feel a little restrictive if for a long time. A water filter is a great alternative to chemical treatment. Finally make sure to google 'Himalayan Hash Harriers' before you leave- this is a must do for anyone - runner or not!



Join us aboard the National Geographic Explorer, a state of the art expedition ship. The medical element will be led by Dr Paul Auerbach, who is the Redlich Family Professor of Surgery in the Division of Emergency Medicine at Stanford University.

Paul is one of the world's leading authority on wilderness medicine and is one of the world's leading authorities on emergency medicine. The ship will also have its own Expedition Leader, a National Geographic staffer, who are amazing experts in their own right and consequently offer a superb environment from which to explore this

CONFERENCE DEPARTS
 27 November to 10 December 2013

Please email **Rebecca Kleinberg** for a reservation form. Should you require further information regarding the itinerary, flights and travel arrangements or specific requirements regarding your stay on the NG Explorer your point of contact is Rebecca on **888-773-9007**, if ringing from outside the US on **001-212-261-9000** or email **groups@expeditions.com**.

In order to access the CME content of this expedition you **MUST** mention "Expedition Medicine" when making your booking.

Contact us by email -
admin@expedition-medicine.com
On the web -
www.expedition-medicine.com

Stuff we love

Words / Graham Dawson and James Gordon
Image / Brad Jackson, Field Touring Alpine

Since a day out can start in the sun and finish in a blizzard you often have to carry sunglasses and goggles. These beauties combine Cat. 3/4 lenses for high altitude glacial glare and Cat. 1 lenses for poor visibility BUT their real secret weapon is a clip in foam backed frame that creates a seal against the face. If you also remove the legs and replace with the clip in headband you have a passable set of mini goggles.



ADIDAS ELEVATION CLIMACOOOL SUNGLASSES

More hot air gets produced about axe choice than almost any other bit of hardware! In the end, almost anything will do and all about personal choice! The Vipers are tried and tested by beginners to pros and are an excellent one-stop-shop. You can get away using it as a walking axe if you remove the finger rests and fully set up you can climb almost any grade you can imagine! The bolt system for changing/ tightening adze and pick is probably the best out there while the weight and price compare favourably with all competitors. An alternative to the Vipers is one of the lightest, T-rated, most ergonomic and best looking general mountaineering axes out there. The subtly curved shaft makes chopping steps and ledges a breeze and its 53cm length is excellent for most tasks. The sharp ferrule and narrow shaft make plunging/belay set up easy and the moveable finger rest makes steeper moves feel very secure.

BLACK DIAMOND VIPER



GRIVEL AIR TECH EVOLUTION



This has to be one of the best lightweight mountaineering and all-round packs on the market. It is well thought out throughout. Comfortable hip belt and shoulder straps mean it can be packed fully without worry, while the expandable lid mean you can squeeze extra gear when needed. The lid is also removable though for those Light and fast days. The ice axe elastics are especially clever and better than any others we've seen. The only drawback is the slightly tricky to loosen waist belt but really this is a small issue on an otherwise outstanding pack. An alternative is the Osprey Variant 37 which comes with ski loops, wand pocket and crampon compression pocket for those more inclined to ski back down.



OSPREY MUTENT 38L BACKPACK

A relatively new model but an excellent choice as a onesize-fits-all crampon. This has huge adjustability for different boot types and styles of climbing. You could make this work for general mountaineering on a B2 boot right through to extreme ice or mixed climbing on a B3. Front point number/length, toe bail position/symmetry - you could tinker with it all night! Comes with easily swapped plastic and wire toe bails and storage bag (the points are so sharp they'll shred your sack if you don't use it).



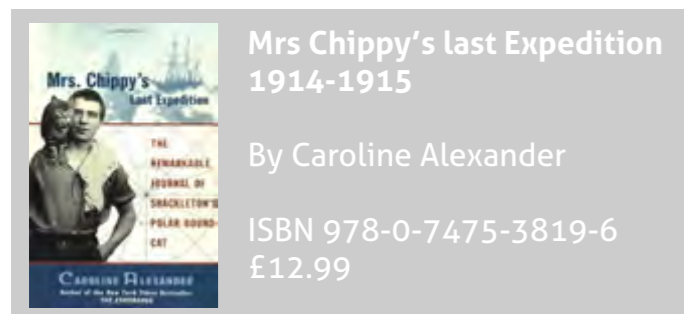
PETZL LYNX CRAMPONS

I'll admit it... I'm biased against leather boots with a membrane: why bother if the leather is good quality and you look after it? Leather will always be more breathable and if it's THAT wet..wear wellies! There is a GTX version if you really want but if you want probably the best-selling, best-allrounder, best-fitting "daddy" of the B3 boot world then get the Extreme! You can use these all over the world for winter walking to hard climbing and still be comfortable at the end of the day. Of course there are warmer, sexier looking boots but these take some beating.



LA SPORTIVA NEPAL EVO

Rowena's Books



Mrs Chippy's last Expedition
1914-1915

By Caroline Alexander

ISBN 978-0-7475-3819-6
£12.99

Spoiler alert for the last paragraph here. However, if you know of Shackleton's trip already, or indeed you're familiar with the brutal decisions made on polar expeditions in the early 1900s, it shouldn't altogether surprise you...

Mrs Chippy's Last Expedition is the somewhat unusually narrated tale of Sir Ernest Shackleton's ill-fated trip on The Endurance to the South Pole in 1914. Originally planning on reviewing a fact-based biography on one of the past century's many incredible winter explorers, I have to admit to being side-tracked in the arctic travel section of the bookshelves, and have found myself, instead, reviewing a fictionalised journal written by a ship's cat. Bear with me! If you're on the look-out for a wintery story that has its roots grounded in a legendary polar expedition, then this is actually quite fun.

The cat (who, despite the misleading name, was actually male) was a genuine resident on The Endurance, tolerated by the Captain to help with mice and morale. Caroline Alexander writes as Mrs Chippy in the standard wistful prose of a journal, albeit with a feline twist, and after an involuntary judder at the overly jaunty introduction by 'Lord Mouser-Hunt', I initially found the descriptions of the team of explorers and their ship charming.

The footnotes that are scattered throughout are a slightly uneasy mix of fact and fiction, but do include quoted observations from Shackleton and his men's own diaries, which helps bring the story to life, painting a picture of what life was like aboard, and overboard,

the ship. Original photos by the expedition photographer 'Frank' Hurley show the living conditions that the team coped with, and the last image, simply titled 'The End', is in itself a sobering reminder of what nature, in the form of a shelf of crushing ice, can do to mere metal and wood.

This was never going to be the in-depth catalogue of hardships that usually mar a journey such as this, but one of the other pleasing things I took from Mrs Chippy was the spotlight it shone on the members of Shackleton's crew who don't usually warrant more than a passing glance in the history books. The observations that the carpenter McNeish had worked achingly hard for 28 hours straight in waist-deep icy water to fix leaks in the hold prior to abandoning ship, and that the stow-away turned out to be an exemplary cook are, in fact, fact. In some respects it was a breath of fresh air that when seen through cats' eyes, the crew members were given equal merit; some of the genuine but lesser-known stories which didn't star Shackleton himself, were brought to the fore.

As a result, there's much to enjoy on a frivolous level in this novel, and if you're looking for a light-hearted book to read over your cuppa tea, it's certainly original. However, despite this, I found it impossible after a while to escape the kitty-centric tone the author used throughout: where I'd hoped for a sarcastic, sly explorer observing polar life with an eyebrow raised, I increasingly found instead the ramblings of a fluffy, overtly clichéd cat. This is such a shame, as I can't help but feel there was real potential to give an amusingly satirical spin on a well-known story of endurance, on The Endurance.

As it is, overall I did enjoy Mrs Chippy. I just can't quite say that after turning the last page, I shed a tear upon the discovery that his fate was, in the end, decided by the wrong end of the skipper's gun. [am.](#)


Time to burn




Here at Adventure Medic, we know it's not just the medicine that inspires you to get out and explore. There's more to the adventure than just the work.

This issue we bring you some great winter vids, from skis and boards, to adventure in the Karakorum, to a little slice of diving joy that brought smiles to our faces.


Don't forget to visit our Youtube and Vimeo channels for more, and if there is a particular piece of footage that you love, please let us know.



All I can
Street Skiing by JP Auclair
Our fav snow vid in ages




Dream factory
Tales of the Alaskan
backcountry on some fat skis




Superheroes of Stoke
Classic, cheesy freeskiing porn
"Gnarly."


click the videos
to view




Fishing under ice
Imaginative and beautiful




Birdman of the Karakorum
Paragliding in one the
remotest parts of the world




Speed flying Aconcagua
3000m descent in five minutes
of epic flying



Denali Experiment
It's not an adventure if you
know how it'll turn out



Greenland
Trial biking the ice



Cassin Ridge
Good attitude from some
young Brits on Denali

Until Next Time

That's it for the Winter Issue but it doesn't end here. Remember to check out our [Youtube](#) and [Vimeo](#) and follow our [Facebook](#) and [Twitter](#) accounts to keep up to date with all things AM.

SIGN UP

To get a link to the next and every new edition of the magazine sent directly to your inbox please head to our [website](#) and sign up for free, so you never miss a beat.

COMMENT

If you have something you want to say about the magazine then please write in. The best letters will get published and we will try to respond to all enquiries and complaints.

CONTRIBUTE

We would love you to get involved too. We want to hear about *your* adventures and be inspired by *your* photographs and video. Become an Adventure Medic contributor by getting in touch with us at contact@theadventuremedic.com. Let others follow in your footsteps, blaze a trail. All things Adventure are welcome and we will read and respond to everything that is sent in.

Photos can be emailed directly, or submitted to our [Flickr Group](#). The best of them will appear in the magazine in all their glory. Equally, if you find interesting news or videos then please send in those links too or share them on our [Facebook](#) and [Twitter](#) accounts to spread the word.

THANKS

We would like to take this opportunity to thank all those who have contributed to the magazine, for the great articles and photos, and all those who have helped put the word out there. However our the biggest thank you is, as always to you, our reader. Please come back next time.

We hope you've enjoyed reading AM. We will be again each and every quarter to remind you that there's more out there to enjoy and wonderful adventures to be had if you take every opportunity to Work to Live.

/ The Adventure Medic Team



NEXT ISSUE MAY 2013

AIR

Photo above: Andreas Busslinger / Busslinger Fotografie / www.andreasbusslinger.ch



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Publisher: Arguemedical Ltd. (SC391219) / Registered office 19 Bruntsfield Ave, Edinburgh EH10 4EN

Email: contact@theadventuremedic.com

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