


# MMSN

Mountain Medicine Society of Nepal

# Newsletter

www.mmsn.org.np

## Contents



## Editor's Note

*It is a tremendous delight to bring forth this new edition of the MMSN Newsletter. The Mountain Medicine Society of Nepal (MMSN) has come a long way through these years since it was established in 2003. With ever-growing number of members, the society has achieved great heights in becoming the most recognized Nepalese mountain medicine forum, both within and outside Nepal. The Nepalese Diploma in Mountain Medicine (NepDiMM), now successfully in its third year, has become a flagship project for MMSN. MMSN is also fulfilling its responsibilities to the Nepalese mountain society through various activities like the Gosainkunda Health Camp, organized on the occasion of Janai Purnima, in collaboration with the Himalayan Rescue Association (HRA), which has proved to be a boon for the thousands of pilgrims travelling to the holy lake. Apart from these activities, we also have been having our regular journal clubs with an aim to boost critical thinking of our members in the field of research.*

*The newsletter features many inspirational articles realting to the lives of many ordinary and extraordinary people. Some will also give you useful information regarding climbing and mountains. In this edition of the newsletter, we have also included experiences of previous diploma participants.*

*Do send us your feedback.*

*Happy Reading!!*

*- **Saurav Adhikari***
*Editor-in-chief*






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## Mountain Rescue

### Buddha Basnyat

The name Himalayan Rescue Association is a "misnomer", as they say in English. The dictionary defines misnomer as an inappropriate or misapplied name or designation. The "rescue" part is the misnomer. This is because we are hardly ever involved in the actual rescue of people in the mountains. We may fly in and go near the site of rescue, but that is not actually rescuing people. We have been very effective in preventing altitude sickness, frostbite, hypothermia, and other mountain-related medical problems and injuries. After all an ounce of prevention is worth a pound of cure. And for a developing country like ours doing all we can to prevent medical problems in the mountains makes a lot of sense.

In this regard for almost 4 decades we have been actively involved in teaching from our Kathmandu office and also from our aid posts in Manang, Pheriche, and recently from the Everest ER about, among other things, prevention of altitude sickness in the mountains. One main message we have stressed time and again is that descent is the best cure to acute mountain sickness before it becomes life-threatening and changes to high altitude cerebral edema (HACE) or high altitude pulmonary edema (HAPE). Many volunteer doctors have been giving these prevention lectures and trying to keep the talks simple so that people from various nationalities including Nepalis are able to understand and avoid severe mountain sickness in the mountains. Of course the importance of prevention is true about hypothermia and frostbite too as especially for frostbite, once the damage is done there is very little evidence-based medicine that we can practice on the patient. Not much has changed in the treatment of frostbite since the nineteenth century when Napoleon Bonaparte's army succumbed to frostbite in their attempt to conquer Moscow in subzero temperatures. One lesson the French army learnt was not to keep rewarming the frostbitten limb. But in terms of drugs for the treatment of frostbite, there are no cost- effective, modern breakthroughs that are even worth considering in the context of Nepal. So prevention remains the main focus. We tragically see porters who suffer from frostbite even though we try our best wherever possible to educate them beforehand about prevention aspects. For example, young doctors from the Mountain Medicine Society of Nepal (MMSN), in collaboration with HRA have been annually giving lectures to porters on these topics.

We will continue to stress on prevention in the years to come. Of course we also regularly treat people with altitude related problems and many times even save lives. Every season without the drugs, oxygen, and the expertise of the doctors and our staff many lives would be lost in the mountains. We feel very privileged to be of service. But coming back to the opening paragraph of this write up, we are not at present involved in any rescues, nor do we have the proper training to participate in such rescues.

Hence it was a welcome change when in late May this year Dr. Hermann Brugger from the EURAC institute in Bolzano (northern Italy) invited some HRA staff members (who had originally taken preliminary, very basic mountain rescue training locally) to Bolzano for enhancing their mountain rescue training skills. In Europe for centuries mountain doctors have been working together with mountain guides to carry out rescue in the mountains. In Nepal we wish to simulate such a bond between doctors and mountain guides so that in some way even if the HRA may not be actively involved in ongoing rescue we will know what true rescue is all about (for example, wearing a harness properly, being able to tie specific knots on the ropes and climb rocks) and hence can be more effective in our desire to help with rescues in the mountains.

In this regard we need to point out the active involvement of MMSN. The young doctors from MMSN (those that had spent time working in the mountains, either with HRA or doing research) who also went to Bolzano with HRA staff and mountain guides are very interested in pursuing rescue in the mountains, working together with mountain guides and thus adding a new chapter in the annals of mountain rescue in the Himalayas. In fact many young doctors now after this training have for fun started to go wall- climbing in Thamel or go rock- climbing in Nagarjung. These activities were practically unheard of for young Nepali doctors who mostly concentrated on academic pursuits and went to the US for further studies or found post graduate work locally. Indeed with this collaboration perhaps the "rescue" in the Himalayan Rescue Association will no longer be a misnomer. Jai Hos.

*Buddha Basnyat, MD, MSc, FACP, FRCP*
*President, MMSN*

# Annapurna: Alive and Awesome

## Suvash Dawadi

Having been peppered with articles online about how the road in the Annapurna Circuit (Manang and Mustang) has destroyed the essence of trekking around the Annapurnas, me and two friends Nirajan and Bikash headed towards the holy grail of affordable trekking. While our primary aim was to refresh ourselves after a grueling 6 months of penance- the IOM final exams and to reach the magic number of 5416 m, we would also get to assess the impact development has had to the people and tourism in this part of Nepal.

As pumped up as we were, we did decide to shorten our trip by opting to ride out the newly completed (I dare say) highway to Chame, the district headquarters of Manang (saving us 2 days worth of walk). So we did the route from Bhulbhule to Chame on a pick up…and halfway in its goods carrier. The road as it turned out was sparsely used by foreign tourists, rather it served the local commuters and for supplies and construction material. We didn't see many (rather any) foreigner on the Mahindra Maxxes and Tata Sumos that plied along the road to and from Chame. And as we travelled past villages like Syange, Jagat, Tal, Bagarchhap, Danaque, Dharapani the hotels were open and occupied with trekkers dusting their boots for the day and taking in the views of the higher Mahabharat Range, business as usual. Of course at some places the trek route and the motor road crossed paths but it must be said that ACAP has painted marks of Red and White for those who want to avoid the road totally.

Once we got to Chame the picture was different. The trek route there was as wide as any mountainous road in Nepal. And here the Himalayan Vista took over. The route was so breathtakingly beautiful that I bet one would hardly notice an 18 wheeler coming through much less the occasional tractor or Pulsar 200 cc. The might of the Annapurnas, Gangapurna, Chulu, Pisang and other peaks, the gush of the raging Marshyangdi and the scattered pines and conifers dwarf whatever distraction humans can conjure up. Add to that side treks from almost every village marked on the map that within themselves offer unique and sometimes spiritual journeys and there is no denying why thousands of nature lovers still flock to this magnificent trail.


The halfway point of the circuit, the mighty Thorung La at 5416m, the steep climb, the icy conditions, the bone shivering cold, the hunger and 5 am march from the base camp seemed like troubles a plenty but once we got to the pass itself jubilation took over…..and so did the camera….as every few steps offered another possibility of that perfect shot…of that unfatiguable supply of profile pics and cover shots for your facebook page…..and only a sweep panorama function in your camera could do justice to the scenery around. And from Manang you suddenly step over to that mythical land of Mustang, with Dhaulagiri dominating the sky to the west and the arid, sand dunes like mountains of various shades and the promise of deliverance from cabbage, carrot and potatoes to that luscious Thakali food!!!!!!! For us Muktinath would be where we would end our journey on foot for two reasons. The first reason was that we had walked this part of the circuit before and the second reason was we wanted to fly out of Jomsom (another experience I would highly recommend). However we ended up on another jeep ride through Mustang and Myagdi to reach Pokhara- sun burnt and dusty shades of ourselves. And throughout the way we saw hundreds of tourists, fellow trekkers who were merrily walking even as the passing buses and our jeep powdered their faces with dust. They trekked as the villages of Marpha, Tukuche, Lete, Kobang, Ghasa and Tatopani still offered them plenty of reasons to walk.

And it was this that made me realize that the circuit is not dead, nor tarnished. Development is inevitable. The road has given comforts to the locals that they would only dream some years ago, but they themselves realize the need to save the trekking route and their traditional ways for it is that which has sustained their livelihoods for many a generation.

It is therefore imperative that the route be maintained and the road avoided by creating alternate detours, for there is no place in this route that has a dull view. Walking across two river valleys, with Manaslu, Annapurna, Dhaulagiri, Nilgiri and other famous mountain ranges as companions and crossing a grand pass into ancient lands is reason enough not just to do the trek once but like some tourists we met , doing it for the 3rd or 5th time. So, all in all at least for me and my friends there was no truth in rumors that the Mighty Annapurna Circuit has lost its charm; the Annapurnas are still there standing tall, the people ever so welcoming are still there and as long as people continue to walk it will always be worth doing the Annapurna Circuit for it is Alive and Awesome!

(This is not exactly a travelogue, just some feedback from the trip of a lifetime… for more be there!!!)

*Suvash Dawadi, MBBS*
*Intern, TU Teaching Hospital*

## The 10 Best Treks in the World

**Saurav Adhikari**

1. *GR20, France*
This demanding 15- day (168km, 104mi) slog through Corsica is legendary for the diversity of landscapes it traverses. There are forests, granite moonscapes, windswept craters, glacial lakes, torrents, peat bogs, maquis, snow-capped peaks, plains and névés (stretches of ice formed from snow).

*2. Inca Trail, Peru*
This 33km (20mi) ancient trail was laid by the Incas and is currently traversed by thousands each year. The trail leads from the Sacred Valley to Machu Picchu winding its way up and down and around the mountains, taking three high passes en route.

*3. Pays Dogon, Mali*
'The land of the Dogon people' is one of Africa's most breathtaking regions. A trek here can last anywhere between two and 10 days, and takes in the soaring cliffs of the Bandiagara escarpment inlaid with old abandoned cliff dwellings.

*4. Everest Base Camp, Nepal*
Reaching a height of 5,545m (18,193ft) at Kala Pattar, this three-week trek is extremely popular with those who want to be able to say, 'I've been to the base of the world's highest mountain'. The difficult trek passes undeniably spectacular scenery and is trafficked by Sherpa people of the Solu Khumbu. The heights reached during this trek are literally dizzying until you acclimatise to the altitude, and the continuous cutting across valleys certainly has its ups and downs.

*5. Indian Himalayas, India*
Fewer folk trek on the Indian side of the world's greatest mountain range. So, if isolation's your thing try trekking in Himachal Pradesh. Hardcore hikers can try teetering along the mountain tops for 24 days from Spiti to Ladakh.

*6. Overland Track, Australia*
Tasmania's prehistoriclooking wilderness is most accessible on the 80km (50mi, five- to six-day) Overland Track. Snaking its way between Cradle Mountain and Lake St Clair (Australia's deepest natural freshwater lake), the well-defined path (boardwalked in parts) passes craggy mountains, beautiful lakes and tarns, extensive forests and moorlands.

*7. Routeburn Track, New Zealand*
See the stunning subalpine scenery of New Zealand's South Island surrounding this medium three-day (32km, 20mi) track. At the base of New Zealand's Southern Alps, the track passes through two national parks: Fiordland and Mt Aspiring.

*8. The Narrows, USA*
A 26km (16mi) journey through dramatic canyons carved over centuries by the Virgin River, the Narrows in Zion National Park is a hike like no other. The route is the river, with over half of the hike spent wading and sometimes swimming.

*9. The Haute Route, France-Switzerland*
Leading from Chamonix in France through the southern Valais to Zermatt in Switzerland, the Haute Route traverses some of the highest and most scenic country accessible to walkers anywhere in the Alps.

*10. Baltoro Glacier & K2, Pakistan*
This corridor of ice leads to the colossal peak of K2 (8,611m, 28,251ft), the world's second-highest peak. This incomparable trek traverses some of the most humbling scenery on the planet.

*(adapted from the Lonely Planet)*

# Sport Climbing and Kids

**Simant Thapa**

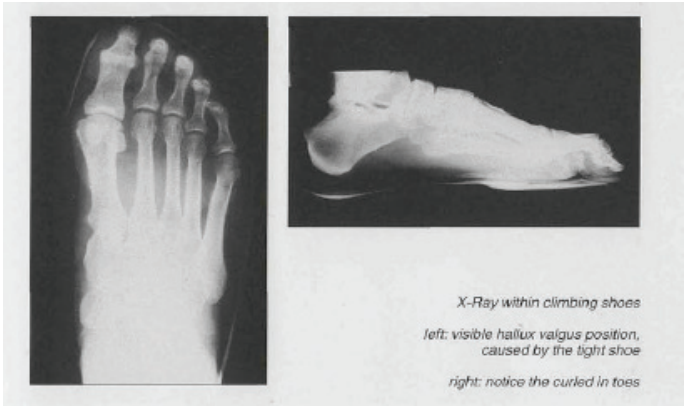
With the advent of sport climbing and the sheer number of climbing walls in the Kathmandu that offer a relatively safe environment, wall-climbing sport has become very popular nowadays, even among the young children and teenagers. Occasionally when I happen to hit the wall for climbing and once people discover that I am a medical doctor, on few occasions I have been asked the same questions about climbing and kids either by the non-climbing parents or the parents that have been active in the sport for years, "Is this sport dangerous for kids?" "Do we treat this as a fun hobby or should we push him/her a bit to excel?" "Should we only let them climb at an indoor gym or should we let them go to natural outdoor venues as well?" These questions and more are very important to ask when kids are just beginning as climbers.

Most of us know that climbing is fun but it also comes with the risks. If you are lucky it might end up being just another minor bruise or scratch. If your good luck charm has just left you, it might end up being nasty lacerations, fractures or a fall that might bust your skull, chest or belly. Overall when we think about risk of climbing we end up counting the entire nasty trauma event. But, in growing children it's more than that.

***The effects of climbing on developing kids and teenagers***

A muscular-skeletal system that has not fully matured is generally not developed enough to handle extreme physical strain. On average, the human bone structure continues to grow until an adolescent is about 18-21 years old. It is known that our tissues are more sensitive to strain when they are growing than when they have reached full development, so extreme methods of training pose far more of threat to the health when younger than 18 years. However, there is not much difference in the climbing grades between today's kids and the adults. The top-level climbers are getting younger, and it is not uncommon for 16 year olds to be in the finals of World Cup competitions where the course grade is 5.14!! This high level of performance is hard on the adults, but it may be even worse on the developing bones and joints of kids.

So regular visit for climbing sessions by children & teenagers but following improper climbing techniques or unnecessary over training can lead to repeated stress on growing bones and cartilages. This in turn can easily lead to problems like various overuse syndromes (tendonitis, bursitis, ganglion, myogelosis, impingement syndrome, etc.) or in some cases even stress fracture of fingers. Some problem associated with the chronic use of tight climbing shoes is the development of the hallux valgus deformity (this condition is characterized by the big toe pointing more towards the little toe than it otherwise would) and hallux rigidus (it is the painful development of osteoarthritis in the first joint of the big toe).



*X-Ray within climbing shoes*

*left: visible hallux valgus position, caused by the tight shoe*

*right: notice the curled in toes*

Near the joints in the children there are thin areas of cartilage commonly known as growth plates. These growth plates allow the skeleton to expand in length. Injuries to these structures during growth will very likely lead to permanent damage, even with treatment.

This does not mean that young children in general should not climb. However, it is important that the kids have a trainer or supervisor who can explain the dangers associated with intense climbing. Also in a large group of kids, natural competition might lead one kid to "over-do-it" when trying to keep up with his/her friend who is more mature. Adults can give guidance so that the permanent overuse injuries and decreases in range of mobility (something that should definitely be avoided in developing bodies) are avoided. It is wise to get an annual medical checkup of the climbing enthusiast kid from an orthopedic doctor who understands the stress of modern rock climbing. Setting up good habits at an early age will help them to have a longer and far less painful life of climbing (If only someone had told us!!!).

Finally, If there is any point at which one needs to really be worried about the child's health as a climber, is when (and if) they decide to take their indoor sport to its original spot in the outdoors. An indoor climbing gym is a controlled environment where the equipment is checked regularly and there are people making sure (hopefully) that safe practice is being followed. At outdoors, a climber is purely under his/her own control. If there is any advice we can give so that the child safely makes the transition from indoors to outdoors, it is to hire a qualified guide to teach them and they will most likely have a long and safe climbing career.

*Simant Thapa, MBBS*
*Nepal Medical College*

# Quest along the Dusty Trail

**Anip Joshi**

The editorial published in the first issue of Journal of Institute of Medicine (Februrary, 1979) has highlighted the starting of "TU Medical Science Diploma- Doctor of Community and General Medicine". The academic program intended to produce not only a physician who would focus on treating a disease per se but also a health leader and a scientist who would take holistic approach towards health problem in the community and society.

I would not be incorrect if I say I got the first taste of field health research when I was posted to Sundarijal for community diagnosis during the first year in medical school. The skills I learnt came extremely handy later when I was doing rural health research with Oxford University Research Group. I enjoyed the field research in rural and remote Nepal because I was already taught the rules of the game, be it walking along the stone paved roads of Okaldhunga bazzar with fellow researcher Jocelyn Habens or trekking along ragged mountain terrains overlooking Khumbu glacier with Dr Ravi Shankar. Then I realized, you as an IOMite, have been introduced to basic know-how of research and that too with a hands-on training during the very early phase of your genesis. I remember Dr. Maskey, our Professor of Epidemiology saying "….you do research every day, even when you go to get groceries" while trying to explain about health research in one of his lectures. How simple yet true a statement it was. And there is Mountain Medicine Society. It introduced me to journal clubs, randomized controlled trials and publishing culture. The participation in scientific meets like South Asian Conference on High altitude, UIAA Medcom and Snakes, Bugs and Altitude provided a platform where I could rub shoulders with the giants, interact with international researchers and eloquent speakers.

If you look around, you will find many opportunities where you can be part of a research and at the same time, pay back intellectually to your society. Just understand that the beauty of science is it is never perfect, more so in our part of the world where the available science is ambiguous and we base our work on imported facts. Dare to challenge the existing beliefs. Falsify the dogma and assumptions with evidence. The forlorn part is we live in a world where diarrhea still claims precious lives (there was more than 300 deaths during 2009 cholera epidemic in western and far western Nepal) when the global medicine has advanced to nanomedicine, robotic surgery and tissue regeneration. We need to identify the lacunae and crevasses and strike a balance with the evidence based facts. The results from robustly designed research would guide us in bridging the glaring gaps and inequities.

Few anecdotes can clarify the status quo. All of us know from our medical school training that TB is rampant in our part of the world but as to why the bacilli behave virulently in our country, we still need more searching. Is it just poverty, less immunity or something else? Do M tuberculosis strains still respond to HRZE or is it time that we do research and start looking for may be X and Y to curb tuberculosis? We don't have the answer. We did lack a major research in TB although we knew it was a major health burden. Diabetes and Hypertension are on the rise in this part of the subcontinent. Have we set up a strong surveillance that the disease is being detected more or is it the modified life style that increased the incidence? Hmm, may be. We were too busy focusing on borrowing facts and statistics from the western world that we never thought it was necessary to have our own research and produce our own data that provides real information regarding our population. We put our patients on lifelong medications because the result of a multinational pharmaceutical company driven research project conducted on a population with entirely different phenotype and genotype - Caucasians, African Americans or Scandinavians or any for that matter, published in a high impact leading biomedical journal states so. Have we ever asked whether their results hold true for the patient population we serve? Still clueless. These stories are simple. Deceptively so. I never even tried to think about answering my own research questions because I thought it required a lot of "funds" until I cleared this myth when I volunteered for WHO research project. Even the western researchers from prestigious institutions try and work very hard to sell their ideas, to prove themselves before their research gets funded. The ingenuity works.

We need graduates with potential as sharp as John Snow who can fight cholera. The million dollar question is will our realm ever get our scientific mavericks - Robert Koch, Gregor Johann Mendel or Harvey Cushing? The young graduates might have the answer to this question. Regarding myself, I am in the path where I would be paid less for advice and more for procedure with threads and needles in the forthcoming days. With new hopes but old fears, I still have to see how far I can keep to my commitment. Medicine always has been and will be a science of uncertainty and an art of probability. The truth of our profession is well described by this quote from Sir Wiliam Osler "We are here to add what we can to life, not to get what we can from life."

The quintessential need of the hour is a protagonist with a vision and momentum, an intellectual adventurer, an academic rebel. By and large, with the ebb and flow of existing situation, the journey is not easy. And the harsh reality is it never was and it never will be. The trails are dusty but the experience is worth.

*Anip Joshi*
*MS Resident, General Surgery*
*National Academy of Medical Sciences*

# Avalanche: A Guide for the DiMM

David Cook

***Introduction***

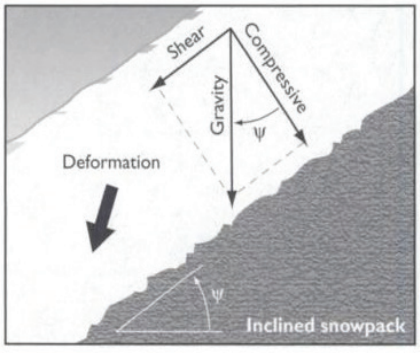
Avalanches are falling masses of snow that often contain ice, rock and other debris. They result after the internal bonds of the snow pack and the bonds between the pack and the ground become overstressed and break.

In the 17 countries represented by ICAR (International Commission for Alpine Rescue) in 2009/10, 251 people were reported to have been killed in avalanches. 46% of these were backcountry skiers (ICAR, 2010). There was a slow decrease in avalanche fatalities in the late 1980s influenced by an improvement in avalanche safety, understanding, rescue techniques and technology. However the trend appears to be on the rise again.

***Formation, Characteristics and Risk Factors***

*Snow Formation*

The snowpack is made up of three components: ice, air and water and is in a constant state of flux. The pack is subject to large shifts in temperature, wind strengths and directions, additional load of new snowfall and surrounding topography.




Snow itself is formed in the atmosphere when super-cooled water droplets come into contact with and freeze around dust particles. As this snow flake falls it increases in size and will go about continual metamorphism until returning to its liquid state on melting. This metamorphism has significant impact on a snow pack's behaviour and in turn it's risk of slipping.

Snow crystals fall and form into packs interlocking with each other's adjacent crystal branches. In packs below a temperature of 0°C the tendency is for crystals to quickly undergo transformation from crystals with complex branches to those with a more rounded shape. This is known as destructive or equitemperature metamorphism. Melt-freeze metamorphism is the process when snow is exposed to a fluctuation in temperatures above and below freezing. This forms a very stable snow pack but has considerable consequences in future avalanche risk following new snow fall (see below). Temperature gradient metamorphism occurs when there is a persistent temperature gradient maintained between the ground and the snow surface. This allows water vapour to migrate through the pack forming 'cup crystals' which have poor cohesive forces and high avalanche risk (Fyffe, 1997). Each new layer of snowfall will be subject to differing environmental conditions producing snow layers which differ significantly across terrains.

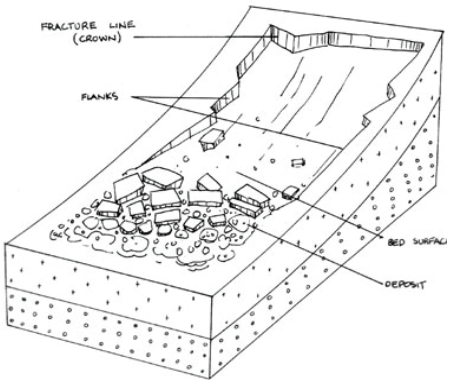
Snow pack is maintained and 'deformed' by several principle forces ; gravity, the constant vertical force, friction and pack cohesion, which are responsible for maintaining the snow pack in its position and shear. The trigger for an avalanche is a reduction in the frictional forces of the snow pack, often secondary to temperature changes or an increase in external forces. These external forces, known as sheer stress, include fresh snowfall, wind or the presence of a skier or climber. The shear strength of snow needs to be overcome by the sheer stress exerted by external pressures to avoid slipping. Finally, compression is thought of as being responsible for snowpack settlement and stability.

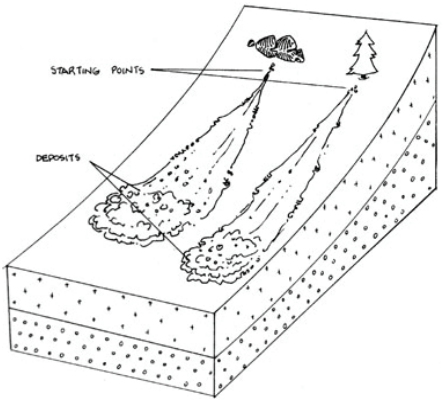
***Avalanche Types***

There are 2 classical categories of avalanches; powder, or loose snow, and slab. The moisture content of both types varies.

Loose snow avalanches occur when there is a failure in the cohesive forces at a specific point near the surface of a snow pack. This initiates the movement of the snowpack down the slope entraining snow and widening as it falls. Loose snow avalanches tend to occur in relatively cohesion-less snow and are typically smaller and less destructive than slab avalanches. (Jamieson B, 2006)

Slab avalanches form after a failure in a weak layer in the snowpack which propagates a fracture in the pack releasing a unit of one or more layers of cohesive snow over crusts of refrozen snow. They tend to be more destructive and cause more fatalities than loose snow avalanches and travel up to 100-125 kph. (Jamieson




et al, 2010; Roberts, B) Wet layers on the snows surface freeze becoming melt-freeze crusts and form the bed of many slab avalanches. The cohesive forces between a melt-freeze crust and further fresh snowfall are small and it is this lack of friction that contributes to the 'shear failure' at the upper boarder of the crust and the formation of a fracture line or crown. Slab avalanches most commonly occur between the angles of 25-550.

Regardless of the category, the destructive power is related to the speed and the mass of the slide.

***The pathophysiology of the buried avalanche victim***

As a result of an increasing amount of studies looking into autopsy and full external examination findings of those killed in avalanches, we are starting to better appreciate the pathophysiology of the buried avalanche victim.

In 1989 Grossman et al concluded that asphyxiation (83%) was the primary cause of death in 12 subjects, far exceeding that of trauma (16%), more recent publications echo Grossman's theory. (Grossman et al. 1989) This research confirms that the majority of all avalanche fatalities are primarily due to asphyxia (79.4%), although trauma was considered a significant contributing factor in 13% of the asphyxia cases in Boyd et al.'s retrospective study of autopsy reports. (Boyd et al, 2009)

Of the 3 trauma cases documented in McIntosh's study, two had internal pathologic evidence, and one had external evidence of severe head injury and severe thoracic injuries predominated in the 3 victims as well. (McIntosh et al. 2007) Both of the trauma victims in Hohlrieder's study were subject to isolated, lethal c-spine injuries. (Hohlrieder et al. 2007)

32 of the 47 trauma deaths in Boyd et al's study had a known cause of trauma and in all of these cases collisions with trees were documented as being the primary cause. This highlights the potential for the variability in cause of death which will undoubtedly occur geographically, Canada's ski fields being particularly densely populated in trees relative to the European slopes for example. Incidentally, Boyd also reports a variation in cause of death related to depth of burial; asphyxia being more common with larger burial depths (150cm in their study) compared to higher incidence of trauma in shallower burials (90cm). (Boyd et al. 2009) The mortality rate also varies considerably in completely-buried victims at 52.4% versus 4.2% in partially, or non-buried persons. (Brugger et al. 2001)

*Survival Probability*

It should be noted that hypothermia features minimally in causes of death related to avalanche. Reports suggest an average core body cooling range from 0.7-3.0$^0$C per hour when buried. This would mean a victim would have to be buried for more than 3 hours before the life threatening side-effects of hypothermia become apparent at 28°C. (Kempainen, 2004; McIntosh, 2007) This is reflected in Brugger et al's survival probability curve. Survival probability in completely-buried victims in open areas (n=638) plummets from 91% 18 minutes after burial to 34% at 35 minutes, then remains fairly constant until a second drop after 90-120minutes. (Brugger et al. 2001) The first 18 minutes after burial is known as the "survival phase", the deaths in this phase are generally due to victims killed by non-survivable traumatic injuries. The second drop at 18mins is due to asphyxia, airway obstruction and trauma. 85% of avalanche victims are in cardiac arrest, mainly secondary to obstructive asphyxia and occasionally secondary to hypoxia. (Brugger et al, 2001)

*Airpocket Physiology*

After 35 minutes the latent phase begins. These are survivors still alive due to a patent airway and the presence of an airpocket. Brugger, Sumann and Falk have shown in studies with non-buried volunteers that smaller air spaces and denser snow both lead to oxygen deficiency, and therefore hypoxia, more quickly. Cold and dry snow is therefore less dangerous.

These participants went on to develop hypoxia and hypercarbia and then respiratory acidosis as the victim starts to rebreathe 'old' air. (Brugger et al, 2005)

The final drop from 28-7% between 90 and 120 is the period in which deaths of buried persons with a closed air pocket are probably due to a combination of slow asphyxia and hypothermia, the so-called "Triple-H Syndrome".

Despite these forensic reports suggesting that asphyxia is clearly the primary cause of death, it is likely that a combination of hypoxia, asphyxia and hypothermia are to blame. For example, an avalanche victim who suffers any degree of trauma, including minor musculoskeletal trauma, may be much more likely to be buried more deeply and die from a combination of trauma, asphyxia and hypothermia, rather than from one of these causes alone.

*Physiology of Hypothermia*

There is a close relationship between hypoxia and hypothermia. When the body is faced with a hypoxic environment several physiological defence mechanisms prevent hypoxic damage; an increase in cardiac output and ventilation being prime examples. Hypothermia also acts as a protective factor but only to a certain degree as by 32°C there is considerable danger of arrhythmias, specifically ventricular fibrillation. This critical core temperature is reached after around 90 minutes following burial which coincides with the second drop in survival probability. (Brugger H, et al, 2001)

*The medical assessment, triage and management of victims*

The prompt extrication of individuals is the most important aspect of the management of victims buried in an avalanche as discussed above. The duration of burial will also dictate the likelihood of injury type and therefore its management; hypothermia following rapid extrication would not be an issue for example.

ICAR have published an algorithm for paramedics and physicians when assessing the extricated patient. Highlighted in this document is the importance of preserving any potential air pocket during extrication and avoiding any unnecessary movements of the trunk and main joints which may precipitate arrhythmias.

While the algorithm focuses on an initial assessment of the individual's conscious level, an immediate ABC (airway, breathing, circulation) assessment should not be overlooked. An ECG and core temperature should be recorded promptly after extrication as both provide information which dictates the management of a buried individual.

The conscious patient categorised in hypothermia stage I and II, should be treated as per Advanced Trauma Life Support guidelines and transported to the nearest hospital with Intensive Care facilities. Regardless of patient condition following complete burial (this is defined as an individual's head and trunk buried) the patient should be hospitalised and observed for 24 hours. Complications such as aspiration and pulmonary oedema are not uncommon.

The following scenarios will be considered with a patient who is unconscious and not breathing:

In patients with obvious fatal injuries, the patient can be pronounced dead. Individuals without obvious lethal trauma who have been buried less than or equal to 35 minutes and/or have a core temperature of under of 32°C should be resuscitated and transferred to the nearest hospital with Intensive Care Unit.

Those with a burial time above 35 minutes and/or core temperature < 32°C will be managed depending on the airway status; if no air pocket is present and/or the airway is blocked, death by asphyxia can be established. If an air pocket is present and the airway free hypothermia stage IV is likely and resuscitation must be continued

without break until re-warming can be started and continued. Cardiopulmonary resuscitation should only begin, therefore, from the moment when uninterrupted resuscitation is possible. At this point transfer to hospital with cardiopulmonary bypass continuing cardiopulmonary resuscitation should be attempted. If this is not possible determination of serum potassium at the nearest hospital will dictate if further transportation at a later time to a more advanced hospital is appropriate. Serum Potassium values exceeding 12 mmol/l means resuscitation can be stopped.

In those in ventricular fibrillation with a core temperature of under 28°C electric defibrillation is generally unsuccessful. The ICAR guidelines recommend up to 3 attempts of DC cardioversion then immediate transfer to hospital with cardiopulmonary bypass under constant resuscitation.

After a prolonged burial time (as from 35 minutes) hypothermia is to be expected, therefore extrication should be not as rushed but performed as gently as possible. The patient should be transported in the horizontal position to minimise the risk of orthostatic hypotension. (Lloyd, 1996)

*Triage*

The ICAR guidance above focus on the sole casualty, more difficulties are faced when faced with several victims. The triage and further management is discussed further below.

Triaging in a mass casualty avalanche scenario is a lot more complicated than that of a road traffic collision, for example. This is mainly because the rescuers have no way of knowing the injury status of buried individuals. The main crux, therefore, is to avoid engaging in the resuscitation of a casualty with likely non-survivable injuries but rather to aim to extract further casualties who potentially are at risk of asphyxia if not found rapidly. These decisions involve complex additional factors such as the depth of burial, the time buried and the extent of injury, which all effect survival probability.

The Avalanche Survival Optimising Rescue Triage algorithm (Lee et al, 2010) is aimed at situations where manpower is overwhelmed in the face of a mass casualty avalanche. As with other triage systems it subdivides the casualties into colour categories; Black represents casualties that are already dead or are deemed 'expectant'. Time is better used on causalities with a higher likelihood of survival. Red patients are those requiring lifesaving interventions immediately and are the highest priority. These patients will also be evacuated first; they will generally require a trauma unit and tertiary centre care. The Yellow category includes patients who are in need of medical intervention but are less critically injured. These patients will be evacuated after the Red category individuals and may not require such intensive medical facilities. (Lee et al, 2010)The 'walking-wounded' are grouped into the green category and should be made safe and kept warm but consist of those requiring the least urgent medical attention. Assessment at the nearest hospital would be appropriate in these cases and do not require rapid extrication.

Triaging in a multi-casualty avalanche scenario is complex and requires great skill, practice is essential before such an event occurs.

*Summary*

Our knowledge and understanding of avalanches has dramatically increased over recent years. There is a plethora of information regarding snow structure and its relationship to avalanche formation and risk, a summary of which has been attempted in these pages. A general understanding of this is important when assessing avalanche prone terrain and encompasses a lot of the essential elements when assessing risk; weather, wind direction, temperature changes and terrain. Avalanche assessment has not been covered in detail here but hopefully the information gained will help start to form a basis of understanding of how avalanche risk is calculated.

With a better understanding of the pathophysiology of buried victims from volunteer experiments and retrospective autopsy studies, our medical management and the design of safety equipment improves. An international, multi-disciplinary effort has enabled us to better predict avalanche risk and increase the chances of survival for many following burial. The prospect of future progression of this knowledge is exciting.

David Cook, MBChB, DiMM
UK

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## Life in Brick Kilns 'One day in a life: ~ 10 years ago'

**Subhash Khanal**

A loud call from Matiram Pun this afternoon managed to wake me up from a long sleep and get ready for the day. We went to Lagankhel to catch the bus to Luvu, a well-known cultural site where I had never gone before. For his thesis, Mati has been doing some work on the brick industries and their environment hazards. In his companion, I too had a chance to visit the places and the people, which in fact were budding in me as 'a hobby' during that phase of life. The last minute exit of Manchester United from the Champions League was still delighting me as we turned south from Gwarko. It was not even two kilometers ahead from Ring-road when Mati decided that we were going to get off. 'I want a longer trip and is Luvu so much nearer to the city?', I said. 'Not actually, we are going to have a walk and this is only Imadol.' We moved ahead on foot along the road. We were near to Tikathali when it started drizzling. We managed ourselves a 'shelter' in a health-post. The post had almost all out-patient faculties, listed on a board. However, lack of human beings in the premise in a broad-day light, of the working day clearly denoted that the facilities were only on the board.

The rain had stopped and we moved ourselves towards the spread-out world of the brick industries in Tikathali. 'This one seems to be a large one' I said. The kiln which was nearby, looked big to me.

'No I don't think so. There are many bigger than this one. We got to have someone to answer our queries but beware of the people with the fairer complexions and the bigger bellies. They are the villains'. Mati seemed to have visited factories many times before.

Mati was certainly indicating towards the owners and managers of the factories who don't like being interrogated and their workers dealing with the outsiders. So we lingered round the chimney-place waiting for the villains to move away. Then we climbed up the kiln and caught up with a 'mistry'. Mati

was getting his answers, still being aware of the owner whom I can't locate. The length of the chimney, the number of the workers to carry the ripen bricks and non-ripen ones; the number of the Indian and Nepalese workers etc. are his field of interest. He had asked me to remember all those answers and remind him later if he forgets any. But, my hearing sense was not up to the mark while busy looking at children happy playing in a single shirt covering the confidential. Yet some of them had caps on. At the same time, I was trying to sort out if they were under-five children or the growth retarded ones. They were all messed in one color, brick-red. 'Whether they go to school or not, whether their parents can afford little more than feeding these children and the answers are certainly negative'. I concluded after a little surveillance to the living conditions around.

We could see a worker keeping the molded disc of flour under the heated brick-dust, accumulated over the underneath kiln. He had a 'roti' prepared in five minutes. He was dead- silent when Mati asked whether the 'roti', full of dust would be liable to eat. I had no query. It was more than useful to eat, as it saved money for fuel. Also, the answers laid all around in the form of small huts each called as 'Khala'. It barely stood as high as those children playing around and hardly accommodated two persons to stretch fully. We could see 'tuki' burning in some of those 'Khalas'.

Mati had a nice story going about the coals used in the brick industries and the possibility of coal-mines in Dang. The young lad working in the cloud of red-dust had started regarding Mati as a coal-trader with future plans to establish a brick industry. I had not much concern in this issue.

We had a camera with us though we didn't dare to use it and the reasons for it were not the lurking owners and managers. We held ourselves back to take photos of 'roti' and 'khala' simply because a call from somewhere within ourselves didn't let us and after all it was not the objective of the day.

However, as we moved ahead, we met a young worker from India who was willing to have a photo. "Babua hamar ik photwa khichwa denge"? He had only desired to get photographed and not even acquiring it. He didn't try to undust or kempt himself and stood by the

side of Mati. In this statement of a person, hundreds of kilometers away from his home in the different country, working in a misery to help out his family back home, we could feel the trench of sorrow. I mumbled, 'when did you take pose for a photograph last time?' and clicked the button. A friend of his, staring from a little distance didn't believe in the whole process as the camera hadn't flashed.

Minutes away from the brick-kiln, we came across a lady working with a big hammer to take stones into smaller pieces all day long. She belonged to a nearby community. We found her to be quite conversational. Mati concluded later that she has been made thorough in answering speedily by interviewers who visit the place for researches. In my consideration, she had 'learnt' every aspect of relationship of the industries to the villages and the villagers. She had understood that the farms had been given up for establishing the kilns. "The respiratory problems are rising in the adjacent communities. The toileting of the vast number of factory-workers and their offspring in close by fields and paths have created a foul environment", she looked furious. However, on the other hand, the factories had given some work to the poor local villagers as well. She was one of them. "We are in a crossroad. The current need for the bringing up children is fulfilled to some extent by working in these factories. However, the invasion of outside-workers and pollution is not good for future generations". She continued. I couldn't catch up with her further as my mind was already recollecting the difficult living conditions that I had come across till then that day.

The sun was already setting. We hurried for the vehicle that would take us to our usual respective habitats. Whether my friend got answers for completing his academic task, I was not sure. Questions kept on coming to my mind, "will the time come when the individuals we encountered today have better living conditions, and the village where we went today is free of dust and smoke?" These individuals and the villages are just the representatives.

I don't know, I will ever go back to meet these people or even visit the place. Will they be there if ever I go there? Before going to sleep as I am writing this last line for the day, I am concerned that whether 'the guy' will receive his printed photograph.

*Subhash Khanal, MD*
*Mountain Medicine Society of Nepal*

## Langtang : An Introduction

**Saurav Adhikari**

Langtang is one of the nearest trekking destinations from Kathmandu and is an unparalleled combination of natural beauty and cultural riches. Langtang lies about 130 km north of the Kathmandu Valley close to the border with Tibet, China. It is Nepal's first national park, and lies between the Himalayan range to the north, dominated by Langtang Lirung (7,245 m), the highest peak in the area, and smaller peaks to the south – Chimse Danda (ridge), Ganja La pass (5,122 m), Jugal Himal and Dorje Lakpa (6,989 m).

The trek here is more adventurous as the area is visited by fewer tourists. Apart from the spectacular scenery, a visit to the area is an opportunity to explore the lifestyle and culture of the Tamangs, whose craftsmanship, language, dress and houses bear their uniqueness. Langtang is also known for its many glaciers – of which there are more than 70 of varying sizes – and high altitude lakes that include Gosainkunda, Parvatikunda, Suryakunda, Bhairavkunda and Dudhkunda. Pilgrimages are made there in August. Another spiritual site is the Buddhist monastery Kyanjin Gompa.

The Langtang River, a major tributary of the Trisuli, passes through the high, gentle Langtang Valley before emptying in a raging torrent into the Bhote Kosi River through a long, narrow defile at the west end of the valley. The Trisuli (or Bhote Kosi as it becomes above Dhunche) forms an important corridor and ancient trade route through the mountains between the Ganesh and Langtang Himal, to Kerong in Tibet.

The park contains a wide variety of climatic zones, from subtropical to alpine. Approximately 25% of the park is forested. Trees include the deciduous Oak and Maple, and evergreens like Pine, and various types of Rhododendron. Animal life includes Himalayan black bear, the goat-like Himalayan Tahr, Rhesus monkeys and Red Pandas. There are also stories of Yeti sightings.

*(adapted from the web)*

# Medical Director's Report and Musings

**Buddha Basnyat**

This year the HRA has been very active as in the years past. The work by our office staff headed by Mr. Prakash Adhikari keeps moving forward with many accomplishments. One of the highlights this year was the Nepalese Mountain Rescue Development Project which was initiated by EURAC Institute of Mountain Emergency Medicine from Italy and the International Commission of Mountain Emergency Medicine ICAR Medcom. The project was financially supported by the Government of the province of South Tyrol, Italy. Technical and mountain rescue education and training was carried out by EURAC and ICAR medcom in cooperation with the HRA and the Mountain Medicine Society of Nepal (MMSN). The ambitious aim of this long term project is to help establish in a stepwise manner a core team of technically and medically trained mountain medicine rescuers and physicians in Nepal who can act as instructors. The HRA provided ample support to this group during the training that was carried out here in Kathmandu from May 25 to June 3, 2013; and we hope that over the years the goals of this project will bear fruit. Generally Nepali mountain medicine doctors are very theoretical, so this training opportunity afforded a chance whereby these doctors could learn technical aspects (for example, how to wear a harness, tie different knots on climbing ropes, walk competently on glacier and so forth). Indeed a great boon for theoreticians.

As HRA celebrates its 40th year anniversary, Mr. Prakash Adhikari says that there is no other organization in Nepal with this long history of providing mountain medicine services in far-flung places in Nepal in such a coordinated and organized manner. We are not a country known for planning ahead and being well organized. And yet the HRA has become an exception to this rule and has been able to effectively coordinate the services of busy, competent Western doctors to volunteer their services in the freezing cold environment of the Himalayas. Many young Nepali doctors have also shown tremendous interest and fortitude and worked alongside the Western doctors in this cold environment for many years now.

Over the last 40 years the HRA has first focused on keeping the Western trekker well in the mountains and treating those that suffer the ill effects of hypoxia. We soon realized in the late 1980s, early 1990s that it was equally important to keep the porter, who accompanied the trekker and climber, well. To this end we started focusing attention on altitude sickness and frostbite in porters. We preached far and wide that altitude sickness and frostbite problems were not just a "bideshi" (foreigner) diseases but that they were very much a "sodeshi" (native) diseases. In addition we wrote articles in peer-reviewed medical journals focusing on the plight of the porters. This kind of focus attracted attention and porter welfare groups such as the Porters' Progress and The International Porter Protection Group came to the rescue after the alarm bells were sounded by the HRA. The HRA is happy to note that we definitely perceive a great change in the attitude of trekking and climbing agencies in making sure that the porter is well looked after. We even told these agencies then that it was also good business sense to take very good care of the porter to attract more foreign trekkers to that agency. Clearly this kind of preaching has had a good effect in improving the porter's plight (not to mention better business for the agency). Clearly more can be done.

Now we would also like to put a similar focus on pilgrims going to high altitude, but pilgrims are very different from trekkers and porters. Many pilgrims are elderly and may have pre-existing medical problems like diabetes, heart and lung problems (indeed, to pray for their illness may be a reason for the pilgrimage). However, many frankly do not seem to care if they die on the pilgrimage as many pilgrims feel they have lead productive lives and are ready to die in such a sacred site. Whereas the trekker and climber may be crying out for help, the pilgrim may wish to die quietly. Reluctant for rescue though some of these pilgrim may be, our mission in the HRA is to try to save the pilgrims' lives (in the first place to try to prevent the hypoxia-related problem) so that they can literally re-think about their attitude at a lower altitude where there is plenty of oxygen to think more clearly. We would also like to take the lead in helping pilgrims in places outside of Nepal. For almost 25 years we have been helping pilgrims at 4300 m Gosainkunda Lake, north of Kathmandu. But it is now time for us to extend our services outside of Nepal to pilgrimage sites like Kailash Manasarovar in Tibet where this year alone about 40 pilgrims (mostly from India) have already died. Chinese doctors are deployed to help the pilgrims but they speak neither English nor Hindi and history taking is impossible so treatment too may be unsuitable. In Shri Amarnath Yatra in Sri Nagar over 100 people died last year. The Indian government sends doctors but many of these doctors do not know about altitude sickness to be able to help effectively. For example, many of these doctors will not have with them commonly used drugs like diamox or dexamethasone; or in the field situation like Kailash Manasarovar or Shri Amarnath, a Gammow Bag is very helpful for treatment of high altitude cerebral or pulmonary edema (HAPE or HACE) rather than using the heavy, almost unportable oxygen cylinders; yet hardly any group in Shree Amarnath Yatra had a Gammow Bag. These are simple tricks of the trade that the HRA can share with foreign doctors and re assure them that sending a cardiologist or a neurologist is not required for treatment as is often thought to be the case by high officials.

Finally we also need to find out in our country how many people die in the mountains every year, the list should include trekkers, climbers, porters, pilgrims and so forth. Such data would help us find out the burden of disease due to hypoxia of high altitude. It is amazing there is no focal data collection point for this.

So hopefully in the next forty years when achievements of the HRA will be assessed again, many of these problems will have been effectively addressed.

*Buddha Basnyat, MD, MSc, FACP, FRCP*
*Medical Director, HRA and Nepal International Clinic*

# Mission Impossible on the Roof of The World

**Piotr Szawrski**

When I heard about the planned expedition I was reminded of a movie quote from the Mission Impossible II. Anthony Hopkins playing Commander Swanbeck says - "This is not mission difficult, Mr Hunt, it's mission impossible. Difficult should be a walk in the park for you". Except that this mission, was not going to be a walk, it was going to be a ride, and it wouldn't be a park, it would the Roof of the World. But would it be mission possible? Cycling from Lhassa to Kathmandu is not very novel, so one may ask, what was the challenge? That came in the form of three tetraplegic riders from New Zealand. Determined and strong in spirit they were set to ride to the Everest Base Camp no matter what! And that was my worry. It has to be noted that the term tetraplegia encompasses disabilities of different magnitude. While those with injuries above the level of C4 vertebrae may need ventilatory support, an individual with C6 level will have functional shoulder movement, biceps and even possibly wrist. It is enough to ride a battery augmented trike. (For further information see www.spinal-injury.net/tetraplegia.htm) Medically, I thought the following points needed consideration: Cervical spine injury results in reduction in ventilatory capacity due to loss of power of the intercostal muscles. Also, obstructive sleep apnoea is more common amongst tetraplegics and nocturnal desaturations are possible. Immobility increases risk for venous thromboembolism. Consequently to the above there may be unrecognised right ventricular compromise, which could prejudice high altitude sojourn. Cardiovascular risks include dysautonomic reactions that could result in stroke. Immobility necessitates great attention to pressure area management and this would be of particular importance in the outdoor setting. Good nutrition should be in place to support it. Traveller's diarrhoea carries more significant consequences owing to immobility and the possibility of compromise to skin integrity. similarly change in diet may result in constipation and dysautonomia. Presence of urinary catheters calls for attention to hygiene that may be difficult on an expedition. This results in high risk of urinary tract sepsis. Temperature control was perceived as problem (both in terms of risks of heat related illness and hypothermia) due to failure of usual regulatory mechanisms such as shivering and seating. In preparation and taking the account of the above a trial hypoxic exposure and exercise during hypoxia has been arranged in the hypobaric chamber. Sleep studies and lung function tests were performed. Although echocardiography was planned this was not done. Haemoglobin levels were checked and any deficiencies were corrected. Prophylaxis against traveller's diarrhoea was planned, as well as rescue antibiotics for urinary sepsis. Given the unusual and specialist nature of the medical problem faced discussions and consultations in person and on-line took place with various specialists in neurology, respiratory and travel medicine. This was in addition to the usual issues A discussion took place concerning carers. Each tetraplegic rider had to bring a carer to help with issues of personal hygiene. The worry expressed concerned carers becoming ill and leaving the tetraplegic individual vulnerable. Hotel access (when applicable) had to be reviewed (for wheelchairs) and arrangements made for camping (big tents able to accomodate wheelchair, suitable bedding and the carer). Questions were raised about suitability of support vehicles. Appropriate medical insurance was organised acknowledging the disability present. One should note that aside from being medical it was a huge logistical challenge, but the two would be intertwined in the event of a problem. Space does not permit for elaborate account of the whole expedition and encountered problems, but lessons learned concerned issues surrounding manual handling, nutrition, and the demands placed on the carers. Future attempts at similar ventures should include a plan to supply additional palatable food rations, have at least two carers per disabled individual and consider the training and the burden associated with lifting and transferring individuals with tetraplegia (from chair to vehicle etc). The expedition was a success, largely due to team work, determination of the participants and previous experience of the trek leader. It was a show of the strength of human spirit and an inspirational achievement that I hope will echo through the history. The expedition had charitable goals andthe money collected will help to tackle the problems associated with tetraplegia, but deep down I think it is the story of the three tetraplegic riders reaching Everest Base Camp will serve to inspire and support others facing similar predicament and disability. The journey also offered a physiological surprise with possibly an altitude record achieved by a tetraplegic. For those with interest in travel and altitude medicine the outcome and the journey are an important lesson, a lesson to believe in and to facilitate similar ventures in the future. So does anyone still think - Mission Impossible?


*Piotr Szawrski, DipMtMed(UIAA)*
*Guy's and St Thomas' NHS Foundation Trust, Great Maze Pond, London, UK*

## NepDiMM Profiles

This edition of the newsletter also features experiences and views of the participants of DiMM I and II regarding the course. Here are a few:

**Beach, Tom (UK)**
**DiMM 2011**

"A fantastic course covering a huge range of theoretical & practical topics relating to mountain medicine. Well organised with a friendly & knowledgable faculty. Highlights for me include the stunning views whilst out on the practical component & the friends I made as a result of the course. Would recommend the course to anyone - and have done, with a friend of mine now planning on attending the 2013 course!"

**Cook, David (UK)**
**DiMM 2012**

"The Nepalese Diploma, run by a great team of enthusistic doctors of varying backgrounds and set in the remarkable setting of the Himalayas, gave me a broad insight into the world of expedition and altitude medicine. I came away with a lot more experience of real life wilderness medical emergencies then expected...unfortunately to the detriment of other candidates! Best wishes to the team for future years."

**Darveniza, Ben (Australia)**
**DiMM 2011**

"Fantastic course with a great bunch of people. We were really lucky to be part of the first course."

**Dowdall, Solomon (South Africa)**
**DiMM 2011**

"The people and space of Nepal took my, breath away. It was the ideal setting for a really enjoyable course. The content of which was rich, structured and approach driven, leaving one with a clear sense of purpose in any given scenario. To be able to tackle the practical aspects in the Himalaya with the guidance of world class mountaineers was a rare pleasure. Thank you to all involved."

**Koirala, Pranawa (Nepal)**
**DiMM 2011**

"Diploma in mountain medicine has given me a way to combine my passion with my profession. From somebody just introduced in mountain medicine it has made me a doctor who now has the confidence to face the challenges of working in the mountains. I wish a bright future to this program which has a very big potential of changing the current medical and rescue scenario of the Nepalese mountains."

**Lohani, Ashish (Nepal)**
**DiMM 2011**

"The first year of the program, was a wonderful mix of people. First would be to thank all the instructors, the participants and the supporters as well for the constant help and feedback we received as organisers. The most memorable perhaps is the 2 day wait to fly to Lukla. Other notable ones would be Bishwo's video presentation, Rachel's horse journey to Namche with John and me; Jim Milledge's talk, and Ben's acting as the rescue helicopter. This is not to say that other times were less memorable. Thanks to all the other organisers I worked with and the participants I learnt with."

**Neupane, Maniraj (Nepal)**
**DiMM 2012**

"DiMM 2012 was an amazing experience. Four weeks passed by in no time with wonderful people around. The best part was social evenings after day full of practical lessons. Punte's and Larry's songs, 'Topi' and 'Tashi Delek' jokes from the mountain guides, beautiful trek, funny videos, Gangnam dances, Sherpa hospitality, amazing team of instructors, guides and students, ...I still miss all of those.
But, mountains had to offer us everything, including emergency evacuation of two of our friends-my tent mates. Those were sad but challenging moments and I guess we were tested as a group. Everything else was awesome, most importantly the friendship that we built together. Cheers to it, again!"

**Ouimet, Chris (USA)**
**DiMM 2012**

"My experience with the DIMM in Nepal is certainly something I will never forget. A few memories do stand out. The instructors and guides were fantastic; very experienced and yet very humble. The organization of, and the material within the didactic sessions was top notch. The trek to Thame and the glacier was obviously the best part. Each photo I have is better than the next. Nothing can prepare you for how cold and windy it will be on the glacier. Despite this am planning a return trip in 2014."

**Panthi, Sagar (Nepal)**
**DiMM 2011**

"The best thing about the course, of course, was the technical part. Before that, all I knew about mountain medicine were AMS, HACE and HAPE. Apart from patient care, the diploma has also helped me develop sport-climbing as a hobby."

**Phuyal, Pratibha (Nepal)**
**DiMM 2012**

"Diploma in Mountain Medicine came as a major break to me during my dull internship days. The best part of it was I could learn while I was having a lot of fun. We had a nice group of people all motivated to have fun, also all who came from different walks of life and I could learn something from everyone. The wall climbing, rock climbing, bouldering and the trekking itself all helping to quench the adventure seeking side of me. Dancing 'Gangnam Style' on the glacier with crampons on was kind of cool. After the course, I feel a lot of confidence to treat a patient in remote areas, away from the modern facilites. All in all, DiMM was an enriching experience and I thoroughly enjoyed it."

**Reid, Hamish (UK)**

**DiMM 2012**

"If only all courses could be as great as the NepDiMM I would do a lot more of them. I was also the lucky recipient of a scenic chopper ride and subsequent appendicectomy (I believe one candidate is obliged to have their appendix out each year for legitimate evacuation practise) and the care I received was fantastic. So thanks to all involved."

**Sherpa, Mingma Thsering (Nepal)**

**DiMM 2011**

"Mountains are not only to be conquered but also to be learned from. I have always been an outdoor person and DiMM helped me understand that medicine lies beyond the clinics – in the wilderness and in the mountains. High altitude medicine and research has significantly contributed in understanding of human physiology and adaptation and DiMM has further deepened my research interest in mountain medicine. A comprehensive course as DiMM makes an individual theoretically sound and adequately prepared for the field. I would like to thank my instructors and my colleagues for their support and encouragement during the course."

**Shrestha, Raksha (Nepal)**

**DiMM 2011**

"Mountains, adventure, fun, awesome friends, great teachers and the opportunity to learn from the pioneers of high altitude medicine made DiMM a memorable experience. I am proud to be one of the first graduates of DiMM in Nepal. I would like to thank all who have made DiMM possible in Nepal."

**Thapa, Simant (Nepal)**

**DiMM 2012**

"Having an immense interest towards wilderness medicine along with being a nature lover, trekker and an amateur rock climber, DiMM was a perfect blend for me. Unlike any other course DiMM gives you the most thrilling and exciting experience for the life time. The training scenarios are realistic and are conducted while trekking and having fun and at least expected time. Thus, it prepares us for the worst and to act efficiently in real rescue situation. Through DiMM I also got to improve my climbing and bouldering skills. During glacier camping days I got to explore a whole new experience of ice climbing which is the most fun thing to do. To make the long things short I just want to say that if I had not been part of DiMM, I would have definitely missed a big thing in my life for sure. Lastly I want to immensely thank from all my heart to Prof. Dr. Buddha Basynat, all the instructors and MMSN for making this dream possible for us and for all others backed up in queue for upcoming year and years ahead. Thank you."

# Ten years down the road in MMSN

**Matiram Pun**

Time flies! It was 2003 (10 years ago!). I was hanging out with some of my seniors. Essentially we used to have few months off after basic science phase in our medical school (of Maharajgunj Medical Campus, Institute of Medicine). Besides playing cricket and visiting brick kilns surrounding Kathmandu valley, involvement in Mountain Medicine Society of Nepal (MMSN) became a major activity for me. I was aware of the fact that my seniors had worked hard to establish this organization few months back while the basic science phase in my medical school was coming to an end. The journal clubs, paper presentations, MMSN_yahoogroups (listserve) and interaction programs were vibrant activities.

Actually, the birth of the society took place up in the mountains when Dr Pritam Neupane (the founding vice president) and Dr Prajan Subedi (founding secretary) were at the Goshainkund lake as health camp doctors. They discussed and formulated few threads of constitution of the society. There could have been no better way to do such work. Such was the name of the society that the acronym sounded like 'masaan', meaning 'ghost at the cemetery' in Nepali! The society was essentially fun with science, various interactive activities and of course mountains. MMSN was on the move. My clinical postings had begun. The developments in MMSN activities took a steady step forward. We decided to organize a workshop for medical students and doctors. Hence a one day workshop in mountain and travel medicine was organized at MoHeGo Building at IOM. It was a great success with lots of eager participants. There was vibrant interaction and involvement from the participants. The pictures speak themselves about the participants and their inquisitiveness.

MMSN started collaborating with Himalayan Rescue Association (HRA) from the very beginning. We maintained this workshop absolutely in line with HRA. Senior medical assistant, Mr Gobi Bashyal and Mr Bhuwan Acharya were invited at the workshop to present their experience about high altitude illnesses and travel medicine from the Nepalese Himalayas. Mr Bashyal gave a presentation and later both him and Mr Acharya demonstrated the technical (as well as practical) knowhow of the Gamow Bag. The presentation and demonstration from HRA staff was extremely captivating. We enjoyed.

The schedule inside MMSN was extremely busy later on. We are working hard to gather scientists and clinicians who are working in the field of high altitude medicine and hypoxia. Our objective was to organize the first South Asian Conference in this field. We named it "Mountain Medicine: The South Asian Experience". We had to write proposals, collect funds, invite scientists from the region and even cover their costs. We were successful in all aspects.

*(continued from page 17)*

We also launched our society website: www.mmsn.org.np. It was excellent team work and spirit. The conference was organized at Hotel Marsyangdi, Thamel on 09 August 2004.

The experience sharing was successful and we followed up with "Mountain Medicine: The South Asian Experience-II" in 2007 (15 September) at Hotel Himalaya (Kupondole Height, Lalitpur). It definitely took a lot of effort and involvement. Inviting scientists from abroad and fully covering their costs (including flight, accommodation, food and conference banquet) was challenging from our standpoint especially because we are a small

and young organization (not to mention run by very young doctors and medical students). But we believed that it helped with the development of science and us as individuals. Much water has flown under the bridge in Bagamati since then and we have made significant progress within MMSN and its activities. Now, we should probably think about forging regional partnership and collaboration in future workshops in terms of expanding the horizons of our organization.

*Matiram Pun,MBBS, MSc*
*Vice-President, MMSN*
*Teaching Assistant, Maharajgunj*
*Medical Campus, IOM, TU*

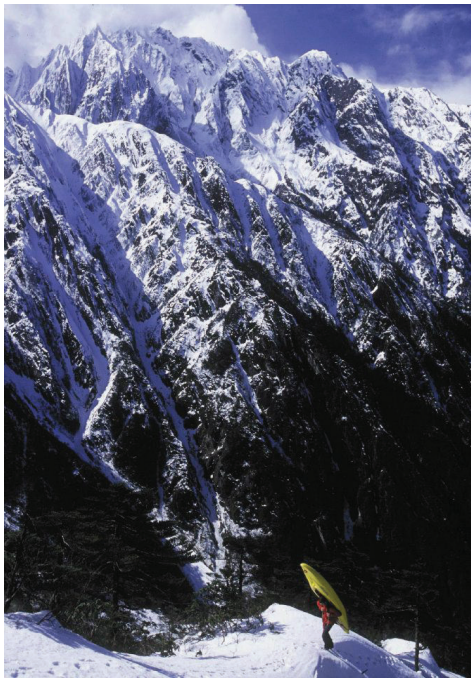
## Medicine on the banks of the mighty Marsyangdi: Adventurous Medical Service in the High Himalaya

**Justin Venable**

The squawking chickens, shouting children and barking dogs of Manang were always there to greet me on my daily ritual. Carrying my brightly colored plastic whitewater kayak through the centuries-old, winding and narrow stone footpaths of this ancient mountain village, I knew they would be waiting for me like the rooster awaits the morning sun. Each day, following completion of my duties of seeing patients or delivering lectures on altitude illness for trekkers, I would grab my boat and head for the river. I knew that on completion of my time as a volunteer altitude physician for Himalayan Rescue Association, I would be heading up river towards the source of the great Marsyangdi River. My objective would be to attempt the first complete river descent (similar to a first ascent of an unclimbed mountain peak) from the source at Lake Tilicho to the confluence with the Trisuli River at Mugling. Never before had the river been paddled in its completion, and certainly not alone - I would be traveling solo.

But I was not solo on my route from the HRA medical clinic through Manang village, as following me like the Bedeshi Pied Piper leading the mice out of the village with my magical flute, were many cheering, inquisitive local children. I traveled down the steep hill and walked upstream along the bank to find a calm area in which to launch my kayak. From the bank, screaming children ran down the paths beside me, cheering me on. I was only out to paddle on my warm-up laps of the short stretch of easy rapids flowing from the river below Tenki Manang to the village of Braga. This short stretch of river was my only access to training while living full time at the HRA clinic in Manang, and I would make the most of it every chance I got while working the three month-long spring season.

While I patiently awaited spring's arrival and the closing of the clinic for monsoon season, I knew that I must not wait too late, for if the monsoon struck while I was still on the river, the boating would quickly become too dangerous. But I wait I must, and in the mean time I continued enjoying every day as a very lucky volunteer doctor while working for the greatest altitude medicine organization throughout Asia, if not the world. This was my second time to work for HRA, and also my second time to live in Manang. The incredibly beautiful scenery, challenging patients (both foreign and Nepali) with all manner and severity of pathology, the warm friends and community of Manang, the wonderful family I had come to know while working there at the clinic - Indira didi, our amazing and lovely cook, and Gobi daai, the hero of HRA clinics everywhere, had all combined to create one of the most rewarding experiences of my life. I sincerely miss them all, and hope to return one day soon to give service again.



As the days grew longer and spring finally brought longer days and warmer temperatures, the winter snows began to melt in the Annapurna Ranges. As the river began to rise each day, and Manang village became increasingly deserted of foreign trekkers, we began to talk of closing time for the season. It is always such a bittersweet time - excited to be traveling again and looking forward to more adventures, but very sad to leave the lovely little mountain village and all the wonderful people there. Yet the time had finally arrived, and instead of either getting on a flight back to Pokhara or putting on my tramping boots and completing the circuit around Annapurna to return to civilization, I grabbed my kayak and walked straight upriver with Indira and my partner Summer, to find the source of the Marsyangdi River at Tilicho Tal.

Carrying a 20kg plastic kayak loaded with 10kg of foot and safety gear was no easy task above 4000meters altitude. I carried as far as I could until the river itself became too small to float the boat, and left it at the Tilicho Base Camp. We continued walking up to Tilicho Tal and explored the area before returning to base camp and my kayak. I bid farewell to my friends, while they walked back down the track to Manang and then onto Chame and back to Besisahar over the next few days, I jumped into my boat and began a long solo journey down a frigid, recently frozen, raging torrent down stream. And what a wild journey it was! As I was alone, I could not take photos of myself, but needless to say the rapids were huge and terrifying...and so much fun!

There were a couple of sections that were completely unrunnable, and I had to carry my kayak around them, but managed to kayak the majority of the river. I arrived in Mugling six days later, having descended over 4000 vertical meters of altitude along the journey. The most amazing part of the expedition was seeing the surprise and shock on the faces of local villagers and a white bearded man in a brightly colored kayak came paddling downstream alone, often in areas where no kayaker had ever been before. People were very friendly and always waved me over to shake my hand and speak a few words of English to encourage me on. I had to carry my kayak around two huge dams on the lower Marsyangdi River, which was quite difficult as the gorge was hard to exit from that stage. But eventually I arrived at the confluence of the Marsyangdi and Trisuli rivers, and the end of my river journey. I waited to load my kayak onto the top of a bus headed back to Kathmandu and the season-completion party for all the volunteer doctors with all the HRA staff. One of the best river trips I have ever done, as the icing on the cake of another spectacular season as an altitude physician with Himalayan Rescue, in one of the most beautiful places on the planet...ekdam ramro chha!

*Justin Venable, MD*
*Hokitika, New Zealand*

## MMSN News Bureau

The second edition of Bugs, Bites and Altitude was conducted in November 2011 at Hotel Yak and Yeti. The 1 day workshop gathered a total of 150 participants.

A talk show entitled "Biology of Inequality" by Dr Stephen Bezruchka was conducted in December 2011.

The same month also saw the celebration of World Spirometry Day. A talk program, "Lung function and Spirometry" as well as a training session, "Spirometry and its Interpretation" was conducted by Prof. Annalisa Cogo.

December 2012 saw Prof Buddha Basnyat, President of MMSN, elected as the Executive President of ISMM.

In June 2013, two doctors who had worked in Everest ER, Dr Ashish Lohani and Dr Pranav Koirala, shared their experiences and cases they dealt with in a discussion session entitled " High Altitude Case Scenarios from Everest".

"Climbing for fun", an excursion to climbing walls within Kathmandu, in order to better acquaint medical students towards wall and rock climbing is being carried out frequently.

The annual Gosainkunda Health Camp was set up in the premise of the holy Gosainkunda lake at 4380m on the occasion of Janai Purnima, which occurs each year in the month of July/August. Five doctors participated this year: Dr Pranawa Koirala, Dr Kamal Thapa, Dr Bikash Basyal, Dr Sanjeeb S Bhandari, Dr Suvash Dawadi and Mr Pawan Karki.

"Gosainkunda Rapid Ascent Trial" was also conducted in 2012 during the festive occasion.


The Jounal Clubs have been continuing with presentations by Dr Subarna Adhikari, Dr Sukhdev Khadka, Dr Ashmita Siwakoti, Dr Saurav Adhikari, Dr Sanjeeb S Bhandari and Prof Buddha Basnyat.

Dr Sushil Pant participated in an 8 week long placement in John Radcliffe Hospital, University of Oxford, UK, organised and coordinated by MMSN in September/October 2013.

MMSN also celebrated World COPD day on Nov 20, 2013. Chief presenters were Prof Annalisa Cogo and Dr Subash Khanal.

MMSN's flagship project, NepDiMM is in its third year and scheduled for February 2014. The previous two editions DiMM 2011 and 2012 have been completed successfully.

Dr Bikash Basyal and Dr Sanjeeb S Bhandari accompanied Prof Annalisa Cogo in the research "Cardiorespiratory health at high altitude" in Lukla in Dec 2013.

And last but not the least; a new executive body has been formed under the presidency of Prof. Buddha Basnyat during a General Assembly held in August 2013. We wish them all the very best for the tenure.

New members are constantly joining MMSN. In 2012-13, there were more than 100 new members added to the society. A separate committee has prepared a detailed log of our members as well.

In 2014, we will continue our journal clubs, talk programs, and events like Diploma in Mountain Medicine, etc.

Keep tuned and keep checking our web mmsn.org.np ; our MMSN and DiMM facebook pages and the mmsn yahoogroup !!!



Send us your feedback and articles for the next issue of MMSN Newsletter at:
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