

Medical reconnaissance for the Defence Medical Services Dhaulagiri Expedition 2016

Flt Lt J Winchester, Flt Lt B Coombs



Abstract

The formation of a clear and well-informed medical plan is critical to the safe planning and execution of any expedition in remote locations. We performed a reconnaissance of medical facilities in Nepal in March 2015 prior to a large Defence Medical Services (DMS) expedition to the Dhaulagiri area in 2016. Visiting relevant medical facilities in person provides invaluable information and experience of what healthcare services may be relied upon in managing an expedition casualty, in scenarios ranging from minor illness to major trauma. We describe the principles, practice and level of detail required for performing such a medical reconnaissance and illustrate this with examples of our findings from Nepal.

Introduction

From 19 Feb 15 to 12 Mar 15 a group of fifteen Defence Medical Services (DMS) doctors conducted an expedition on the Dhaulagiri Circuit in Nepal. As well as conducting various studies at altitude and affording junior doctors experience in wilderness and expeditionary medicine, the purpose of this trip was to reconnoitre the route for a much larger expedition due to take place in 2016 involving up to 200 military personnel. In part, the 2015 trip included visiting various medical facilities in Nepal to assess their suitability for use should injury or illness demand it.

Why conduct medical reconnaissance?

The planning of any expedition must include clear plans on what to do in the event of illness or injury, whether trivial or life-threatening. While expeditions are not overly risky, this becomes especially important when an expedition will take place in a potentially dangerous, remote and poorly accessible area (1). As an 8000m+ peak (the 7th highest in the world) and several days walk away from the nearest road network, Dhaulagiri clearly meets this definition. Potential hazards include acute mountain sickness, high altitude pulmonary and/or cerebral oedema, effects of cold and exposure, trauma, and diarrhoeal illnesses. This is in addition to conditions that can affect any individual in any location, such as upper and lower respiratory tract infections and minor musculoskeletal injuries.

Clearly, part of the medical planning for any expedition will include deciding what can safely be managed by the team and what would demand diversion to a medical facility for further assessment and treatment (2). This will be dictated by:

- The qualifications and skills of the members of the expeditionary team.

- What equipment can be carried on the expedition in dedicated medical kits.
- Options for evacuation/extraction.
- Quality and accessibility of nearby medical facilities.

In order to make a robust medical plan, it is therefore vital to have a good understanding of accessible medical facilities both locally, regionally and further afield.

Medical facilities

The first priority is to identify potentially suitable medical facilities. Information can be gained through online resources such as the hospitals' own websites or guidebooks. However, these are unlikely to give an entirely accurate representation of the situation on the ground and will provide only limited insight. It is clearly neither practical nor desirable to visit every single practice and hospital, so an element of local knowledge, for example from a guide or tour company, is essential to identify the larger, better-equipped facilities. The Foreign and Commonwealth Office may also be able to advise on what services they access (3). Some guides or companies may also have experience of working with or using these hospitals in the past, so working relationships may exist already.

We visited the hospitals identified by our Sherpa guide in small groups of up to six people without advanced appointments, and in general experienced no difficulties in finding someone appropriately knowledgeable who was happy to provide a tour and answer any questions we had. It was helpful to be accompanied by someone fluent in the local language and therefore able to make initial enquiries on our behalf.

We found that as doctors our medical experience was useful in building a rapport with local staff due to our shared professional background. More significantly, it is important that the individual(s) conducting a medical reconnaissance have a working knowledge of healthcare in order to appreciate what questions to ask, what to look for, and to understand how any given hospital compares with local and international standards.

Inspection of the hospital provides a good assessment of the general quality of the facilities. It is important to remain pragmatic about healthcare provision in less-developed countries, bearing in mind that expeditions are likely to take place in the most remote and economically-deprived regions. Specific points that should be noted include the following:

Staff

- Range of available specialties.
- Degree of nursing care provided (some hospitals expect relatives to provide personal care).
- Training, skills and experience.
- Working hours and on-call availability.
- Level of English spoken.

Medical Facilities

- Cleanliness and hygiene.
- Number of beds.
- Provision of private wards or 'cabins'.
- Operating theatres (number, size and equipment level).
- Imaging modalities, with details of X-Ray (XR), Ultrasound (US) and Computed Tomography (CT) facilities.
- Access to fully stocked pharmacy and emergency drugs.
- Piped/bottled oxygen supply.
- Laboratory facilities.

Infrastructure

- Electrical and water supply.
- Clinical waste disposal.
- Accessibility (road, helicopter).
- Communications (telephone, internet).
- Security.
- Contact details for further enquiries.

Evacuation and extraction strategies

However advanced a hospital may be, it is not fit for purpose if it cannot be accessed in a timely manner. This will be highly dependent on local infrastructure. It should be considered that patients with even minor injuries such as ankle sprains may be extremely difficult to evacuate on foot in remote locations where access consists only of marginal trails or mountain paths. Helicopter evacuation may initially seem to be an easy and attractive option, but is not consistently available (due to weather and location),

potentially risky (local operators may not meet rigorous safety standards) and very expensive.

When assessing helicopter evacuation the following should be considered:

- Accessibility of potential Helicopter Landing Sites (HLS).
- Carrying capacity (may be severely reduced at altitude).
- Range (and flying time).
- Provision of landing sites at medical facilities and/or transfer from nearby airfields.
- Likelihood that weather will interfere with flying operations.
- Equipment level of helicopter (e.g. dedicated air ambulance or bare airframe).
- Staffing (consider whether the expedition medic would need to accompany the patient).
- Safety and reliability of helicopter operator.
- Payment and insurance arrangements.

Financial and insurance implications

It is particularly important to enquire about the requirements for payment for medical treatment at all stages of the medical plan. Most countries will not provide healthcare free at point of care as in the United Kingdom (UK), but may demand some payment up front or presentation of insurance documentation before agreeing to commence any treatment. It should also be considered whether UK-based insurers are willing to cover care at these local facilities. Where possible, groups should travel on a common policy in order to avoid possible discrepancies between cover afforded to different individuals in the event of illness or accident, as well as needing to make a larger number of telephone calls. A Defence Instruction and Notice (DIN) is available with precise details of what is and is not covered by Defence liability (4).

Use of reconnaissance data in medical planning

Collation of data gathered, as well as first-hand experience of each individual facility, will allow expedition planners to decide on the circumstances in which any of the identified medical practices and hospitals may be used. Not all of the identified facilities will be appropriate for the management of all conditions. Expedition leaders and medics should consider under which circumstances they would be happy for a team member to be taken to a small, basic local facility or would require full extraction to a larger hospital further afield. For example, a small rural hospital with basic XR equipment would clearly not be the preferred location of extraction for a patient who has suffered a major traumatic brain injury. However, it may be entirely appropriate for someone with an ankle injury to undergo simple imaging to exclude a fracture before potentially re-joining the expedition.

These considerations facilitate the formulation of a detailed

medical plan describing different options for evacuation and treatment, both for different severities of illness, and also at different points along the expedition trail. This ensures that those with serious injuries or illnesses can reach definitive care with minimal delay, whilst conversely allowing individuals with more minor ailments to be rapidly assessed and treated locally, minimising interruption to the attainment of the expedition’s goals. Insurers can be contacted in advance in order to ensure cover will be extended, with contact details distributed and lines of communication established in case of emergency.

Medical facilities visited

Sadly, two large and destructive earthquakes devastated Nepal, with great loss of life, as this article was being prepared for publication (5). It is therefore likely that medical capability in the area will have been significantly degraded, as well as inundated with casualties, and this should be taken into account in future planning. We include our observations as a guide to the facilities available with the appreciation that the situation on the ground may have significantly changed, and as an illustration of the level of detail required when performing medical reconnaissance. Table 1 contains a summary of our findings and facilities visited.

Myagdi District Hospital, Beni

This is a small community hospital on the outskirts of Beni that serves a large regional rural area. Departments are spread across the hospital site in numerous small low-rise buildings, consisting of a few simple wards. The hospital is staffed 24/7; however, care is provided by a relatively small team (in single figures) of mostly junior doctors who may not always be on-site. The Medical Director is an orthopaedic surgeon who has recently worked in teaching hospitals in Kathmandu, but is constrained in his ability to provide complex surgery by the very basic operating theatre facilities in Beni.

Gandaki Medical College, Pokhara

This is a large, well-established teaching hospital in the centre of Pokhara, Nepal’s second most populous city. Most departments are contained within one main hospital building with a few outpatient services and a pharmacy contained in smaller adjacent structures. Emergency care is provided 24/7 and the hospital appears well-staffed at all hours. While a consultant faculty in most core specialties is available, including otorhinolaryngology and ophthalmology, the facilities in general are of a standard below that expected in the UK, with basic ‘cabin’ private rooms as well as large open wards. At time of writing, the




	MDH, Beni	BGN Pokhara	GMC Pokhara	Grande Kathmandu
				
Distance from Dhaulagiri Summit	38 km	117 km	120 km	324 km
Beds	20	2 in emergencies	542	200
Cleanliness and Hygiene	Basic	Excellent	Adequate	Excellent
Staffing	24hr provision, not necessarily on site	24hr on call GP	24hr full medical staffing	24hr Trauma Team 1:1 nursing on ICU
Imaging	XR, Basic US	Nil	XR, US, CT	XR, US, CT, Magnetic Resonance Imaging (MRI)
Specialties	Basic orthopaedics	GP	Otorhinolaryngology, Orthopaedics, General Surgery, Ophthalmology, ICU	Neurosurgery, Cardiology, ICU, Spinal Surgery in addition to most others
Laboratory	Yes	No	Yes	Yes
Air Accessibility	No	Sports fields could be used as improvised HLS	Pokhara Airport 5 mins by road	Rooftop helipad
Dental Facilities	Yes	No	Yes	Yes
Appropriate Use for Dhaulagiri 2016	Minor injuries for XR, Primary Care, Dental problems	Primary Care	Hospital care if transfer to Kathmandu not available	Major trauma Definitive care

Table 1. Summary of reconnaissance findings from medical facilities visited in Nepal in March 2015.

hospital was attempting to recruit a neurosurgeon. Pokhara has a small airport and ambulance transfer is available.

Medical Centre, British Gurkhas Nepal (BGN), Pokhara

This is a small primary care centre catering for the needs of the local staff, as well as playing a busy role during Gurkha recruitment. A local doctor mans the centre with a nurse and medical assistant. There are no dental facilities available and patients from the base are referred to dentists in Pokhara. BGN Pokhara is a ten to twenty minute drive from the centre of Pokhara itself. In general, the facility is clean, tidy and quiet and meets the standards of a General Practice (GP) in the UK.

The facility can be accessed 24/7 via the guardroom or duty officer. Emergency equipment available includes scoop stretchers, a crash trolley and a well-stocked pharmacy including intravenous drugs. Two beds are available to hold patients for a few hours prior to onward transfer. Nearby sports fields could serve as a HLS. Internet and Defence Information Infrastructure (DII) access, and electronic medical records, are available.

Grande International Hospital, Kathmandu

This is a recently opened 200-bed facility on the outskirts of Kathmandu. It is the equivalent of a small teaching hospital in the UK, with new and up to date facilities. A helipad on the roof has dedicated lift access to the modern emergency room and Intensive Care Unit (ICU). Flight time from Dhaulagiri region is in the order of three or four hours. Helicopters are currently provided by third party operators and are not equipped with medical equipment, although the hospital is aiming to acquire its own critical care transfer capability, which it hopes to have within twelve months of the time of writing. Onward transfer can be arranged to Tribhuvan International Airport. The hospital has a large faculty of consultants, as well as visiting specialists. Most surgical specialties are present

including neurosurgery, a large trauma and orthopaedics department, otorhinolaryngology, ophthalmology, maxillo-facial surgery, and plastic surgery. The building has been designed to be resistant to earthquakes up to Level 8 on the Richter Scale. There is piped oxygen and suction, backup generators, and reverse osmosis water purification. There are large numbers of security staff and closed circuit television and there are two floors of private rooms, which have en suite bathroom facilities, television and fridge. The hospital manages its own blood bank and all blood products are screened for blood-borne viruses.

Conclusions

Having a comprehensive medical plan is a vital prerequisite of any expedition. It should be recognised that no team will be equipped to deal with all illnesses or injuries that may occur, while appreciating that they do not need to be. What is needed is an understanding of what medical facilities are available, under what circumstances they may be required, and how they can be accessed. Whilst time-consuming and potentially difficult when an expedition is to take place in a distant country, this information is best obtained by visiting hospitals and medical centres to see first-hand what they may be able to offer.

As junior doctors, the responsibility of the health and welfare of an expedition is a heavy burden, outside the comfort zone of hospitals where the support or advice of a senior is almost always available. In a remote location, as in a National Health Service hospital, knowing how and where to get assistance when a situation exceeds your capabilities is of critical importance. A sound reconnaissance will create a robust foundation for making decisions regarding casualty management and transfer, providing structure and order at a time of stress and confusion, and contributing greatly to the confidence of an individual working alone in a remote environment.

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Authors

Flight Lieutenant J Winchester, MB / BChir
 Birmingham Heartlands Hospital
 James.winchester@cantab.net
 Flight Lieutenant B Coombs, BMBS, City Hospital, Birmingham